AMITY UNIVERSITY

A RESEARCH & INNOVATION DRIVEN UNIVERSITY GRADE A+ ACCREDITED BY NAAC

ANNUAL REPORT

2023

Amity Science, Technology & Innovation Foundation (ASTIF) & Amity Directorate of Science & Innovation (ADSI, AUUP)

A Journey towards Research Excellence

Message from Founder President

"I breathe Innovation; I dream innovation and ensure that our outcome-based research and innovation ecosystem enable us to achieve ever rising benchmarks of success."

It gives me immense joy and pride on this momentous occasion as we reflect upon the accomplishments and strides made by us over the past year. The Annual Report of Amity University stands as a testament to our collective commitment to excellence, innovation, collaborative spirit and a relentless pursuit of knowledge.

In 2008, I envisioned and established the Amity Science, Technology & Innovation Foundation (ASTIF), followed by the Amity Directorate of Science & Innovation (ADSI) in 2014. These entities were born out of a deep-seated commitment to fostering a culture that promotes, supports, and augments an outcome-based approach to research and innovation across our university landscape. As we peruse the 8th Annual Report prepared by ASTIF & ADSI, we take stock of our accomplishments, each thread woven with the hard work, dedication, and ingenuity of our faculty members and researchers. As we delve into the pages of this report, it becomes evident that the spirit of research and innovation continues to be the driving force behind our journey towards academic excellence.

When the distinguished personalities and opinion makers from various walks of life from India and overseas congratulate and compliment me that the brand **'AMITY'** has set new milestones in the field of education. Now Amity is not only respected and recognized in India but also globally and they say, this enhances the image of Indian education worldwide. Listening to all these, I feel so proud of my Vice-Chancellors, HOIs, HODs, Faculty, Staff, Ph.D. Scholars, and students at the campuses that it is all because of them and their further single point agenda is to make AMITY a global brand amongst the topmost and leading Education Groups in the world. We are going to realize it.

I have envisioned that at least 25 Amity faculty start-ups will be established in the next 2 years, and I am sure that you all will make my vision a reality. Let us continue to march forward, breaking new ground, and contributing meaningfully to the world of academia and beyond. Together, we shall continue to soar to greater heights, solidifying our position as a "Topmost Research & Innovation Driven" University.

Wishing you all continued success and looking forward to another year of groundbreaking achievements.

Warm regards,

Dr. Ashok K. Chauhan
Founder President
Ritnand Balved Education Foundation (RBEF)
Amity Global Education and Research Establishments

Preface

It is with great pleasure and pride that I present the Annual Report 2023 of Amity University, a compendium of our collective achievements, endeavors, and milestones in the realm of research and innovation. This report stands as a testament to the unwavering commitment and relentless pursuit of excellence by our vibrant and dynamic community.

I would like to take this opportunity to express our gratitude to Founder President Dr. Ashok K. Chauhan, Chairperson Dr. Amita Chauhan, Dr. Atul Chauhan, President of the RBEF, Dr. Aseem Chauhan, Addl. President of the RBEF and all the trustees, for their guidance and support in our endeavors.

My sincere gratitude and appreciation to all Vice-Chancellors, Pro Vice-Chancellors and Senior functionaries for leading their respective campuses in carrying out the mission and dream of the Honorable Founder President.

Established in 2008, Amity Science, Technology, and Innovation Foundation (ASTIF) was conceived with a vision to be the catalyst for fostering a culture of innovation and research within the Amity University ecosystem. Over the years, we have strived to create an environment that nurtures creativity, encourages inquiry, and supports outcome-based approaches to research endeavors.

The 8th Annual Report encapsulates the spirit of inquisitiveness and innovation that defines our institution. It showcases the remarkable strides made in diverse fields, from cutting-edge technological advancements to pathbreaking discoveries. Our faculty and researchers were able to receive **109** Projects sanctioned during the year amounting to **₹ 29.67** Crores bringing the total number of ongoing projects to **268 amounting to ₹ 112.10 Crores** In addition, **7073** Publications in journals of repute have been published this year. **266** Patents have been filed during the year taking the total filings from Amity to 2110 and **280** patents have been granted including **119** during 2023 itself. Each accomplishment is a testament to the collaborative efforts and intellectual prowess of our community.

I extend my heartfelt appreciation to each member of the Amity community for the dedication, contributions, passion and commitment to maximize the outcome from our science and technology endeavors. As we celebrate the successes of the past year, let us also look ahead for a higher accomplishment to scale new pinnacles of achievements in research and innovation. ASTIF in consultation with all Universities has set a target for the year 2024 with 8400+ Research Publications in Scopus and web of sciences indexed journals, 190+ funded research projects, 420+ patent filing, commercialization of at least 30 technologies/ products developed by researchers.

The journey of research and innovation is continuous, and I am confident that, together, we will scale new heights and contribute meaningfully to the global landscape of knowledge. Thank you for your unwavering support and dedication. May the spirit of inquiry and innovation continue to guide our endeavors in the years to come to realize the vision set by our Hon'ble Founder President for Amity to be among the Top Institutions at the National level for Science, Technology, and Innovation.

Dr. W. Selvamurthy
President, ASTIF & Director General, ADSI

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PREAMBLE

In the pursuit of academic excellence and a commitment to advancing knowledge, Amity Education Group envisioned and established the Amity Science, Technology & Innovation Foundation (ASTIF) in 2008, followed by the creation of the Amity Directorate of Science & Innovation (ADSI) in 2014. These entities were conceived with a forward-looking vision to propel Amity University into a realm of global leadership in research and innovation.

ASTIF, as the foundational pillar, was established with a singular mission by Hon'ble Founder President, Dr. Ashok K Chauhan to facilitate, promote, support, and augment an outcome-based approach to nurture research and innovation initiatives across the diverse disciplines within Amity Universities. Serving as the foundation for groundbreaking ideas, ASTIF has played a pivotal role in fostering a culture of curiosity and exploration among faculty members, scientists, researchers, and students alike.

Together, ASTIF and ADSI form the backbone of Amity Universities and institutions' commitment to become the "Topmost Research & Innovation Driven" organization. Through their combined efforts, these entities have catalyzed an environment where intellectual curiosity is celebrated, interdisciplinary collaborations are nurtured, and innovative solutions to global challenges are actively sought.

As we reflect upon the journey thus far, ASTIF has not only contributed to the academic prestige of Amity University but has also positioned it as a hub of intellectual ingenuity on the global stage. This preamble serves as a testament to the foresight and dedication that birthed ASTIF, paving the way for a future where Amity University continues to shine as a beacon of research and innovation.

This report is a compilation of the salient research and innovation accomplishments of Amity Universities and institutions during the year 2023.

Founder President, Ritnand Balved Education Foundation
Amity Global Education and Research Establishments
& Chairman, ASTIF

Dr. W. Selvamurthy
President, ASTIF & Director General, ADSI

Prof. (Dr.) Ajit Varma
Vice President, ASTIF

Prof.(Dr.) B.C. Das
Vice President, ASTIF

Prof. (Dr.) S.L Kothari
Vice President, ASTIF

Prof. (Dr.) V.K. Jain
Vice President, ASTIF

Lt. Gen. S.K. Gadeock
Vice President, ASTIF

Prof. M.S. Prasad
Vice President, ASTIF

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In order to achieve the objectives set for ASTIF & ADSI the following Human Resources have been provided.

HUMAN RESOURCES

Dr. Gopal Bhushan
Dy. Director General, ADSI

Mr. S. N. Singh
OSD to President, ASTIF & Director, ADSI

Dr. Goodwill Khokhar
Dy. Director
ASTIF & ADSI

Lt. Col. C V Gopal
Dy. Director
ASTIF

Ms. Sneha Nair
Asst. Director
ASTIF

Dr. Vaibhav S. Bhugra,
Scientific Staff Officer
ASTIF

Mr. Benny Thomas
Assistant Manager
ASTIF

Mr. Sanjai K.V.
Sr. Executive Secretary
ADSI

Mr. Devendra Kumar
Research Officer
ADSI

SUPPORT STAFF

Mr. Shailendra Tiwari

Mr. Vinod Kumar Chauhan

Mr. Gaurav Kumar

Mr. Hira Lal Kumar

IPR Team

Dr. Smita Sahu
Director, Amity IPR Cell

Mr. Harish
Deputy Manager

Mr. Sonu Raghvan
Assistant Manager

Dr. Abhishek Nandy
Senior Patent Associate

Mr. Dushyant Singh
Patent Associate

Ms. Kiran Kotnala
Technical Assistant

Mr. Pawan
Support Staff

DITT Team

Dr. Meenakshi Kanojia
Sr. Dy. Director

Ms. Nishi N Narang
Senior Manager (Projects)

Mr. Shashank Singh
Assistant Manager

CHARTER OF ASTIF

Amity Science, Technology & Innovation Foundation (ASTIF): The various charter and activities of ASTIF are:

1. Develop appropriate research ecosystem for promotion of cutting-edge research in emerging fields of national and international importance.
2. Set targets for Projects, Patents, Publications, Technology Transfer, Consultancy, Extension, Ph.D. programme and enable the Amity group to achieve them.
3. IPR Protection: Filing of Patents and ensuring their grant through coordination and follow-up with the office of the Controller General of Patents. In addition, Copyrights are also registered.
4. Encourage Development of technologies and products leading to Commercialization through Transfer of Technology to the Industry.
5. Organize lectures/ oration from eminent scientists from India and abroad.
6. Conduct workshops and training programmes for writing quality Project proposals, Publications, IPR augmentation.
7. Offer financial support for selective scientific projects and offer fellowships to meritorious research scholars.
8. To identify and nurture scientific talents through research cluster formation, interaction meetings and providing synergy.
9. Dissemination of scientific achievements, research excellence and innovations to promote visibility of Amity Group through media.
10. Developing research policies/ concept notes relating to areas connected with promotion of quality research and innovation.
11. Development and updation of ASTIF Website and formulation S & T Brochures, promotional Film highlighting research accomplishments.
12. Facilitating National & International research Collaborations and promoting synergy of brains.
13. Identification and submission of quality applications/ proposals under various National/International Awards & Fellowship schemes.
14. Promoting Global Research Hub, initiatives in niche areas such as Global Research Network on Novel Viruses, Neurospine etc.
15. Conducting review meetings of all Amity Universities/Institutions in India & abroad to assess the Health and Performance management of the Organization.
16. Providing assistance to all AU Campuses addressing specific issues, if any, related to HR, Projects, Certifications like NGO Darpan registration etc.

CHARTER OF ADSI

Amity Directorate of Science & Innovation (ADSI) has also been established in 2014 to address all issues related to research and innovation at AUUP-Noida, Greater Noida, Lucknow & Dubai. 26 institutions under Science & Technology domain in AUUP have been brought under this Directorate for overseeing their performance. The main charters of this Directorate are:

1. To facilitate and catalyse research activities in AUUP and its constituent campuses.
2. Set quantitative and qualitative targets in terms of research, publication & patents etc.
3. Periodic review and monitoring research endeavours including those of Ph.D. scholars.
4. Review and augment research facilities in the S&T Institutes as per the emerging needs.
5. Formulate Annual Research plan and monitor its progress in AUUP aligning to Broad Based Goals.
6. Motivate faculty members to attain their best in terms of competence, commitment, and self-motivation.
7. Promote transdisciplinary research with the participation of various relevant research Institutes.
8. Administrative & Financial Management of Funded Projects of AUUP.
9. Accreditation and rankings related activities of AUUP pertaining to Research, innovation, and extension activities.
10. To resolve any administrative or HR issues and address the grievance of Faculty and Scientists as and when referred to the Directorate.
11. Support Amity Institute of Defence Technology (AIDT) for defence technology programme including industries/schools and DRDO/ISRO interaction/special invites/talks and arranging internship.
12. Preparation of reports/notes/concept papers on emerging areas of interest to Amity.
13. Support to Amity Institute of Defence & Strategic Studies (AIDSS) as and when consulted.
14. Support ASTIF in all its endeavours including review meetings, hosting of guests and coordination of their visit to Amity/workshop/conferences/guest lectures.
15. Any other activity as and when assigned by the apex management.

GLIMPSE OF ACHIEVEMENTS 2023

1. Projects:

- A total of **109 projects were sanctioned** during the year 2023 with a total cost of **₹ 29 Crores and 67 Lakhs.**
- A total of **268 projects** with a sanctioned amount of **₹ 112.10 Crores** are being undertaken by our brilliant faculty members and researchers across Amity Universe. We have successfully **completed 64 projects** with a sanction amount of **₹ 19.38 Crore** in the year 2023.
- Amity has undertaken **221 consultancy and training projects** generating a revenue of approximately **₹15 crore and 49 lakhs** in the year 2023.

2. Publications:

- A total **of 7073 publications have been made, out of which over 300 are having an impact factor ranging from 6.0 to 169.**
- **The h-index** of the University is **136 with a total citation of 66889.**

3. Patents/Copyrights:

- Amity has filed 2110 patents as on December 31, 2023 out of which 280 have been granted.
- A total of 266 patents were filed and 119 have been granted during 2023.
- 107 copyrights have been filed and 135 were registered in the year.

4. Technologies Transferred:

- **Novel Protease Enzyme** transferred to M/s Balaji Enzyme & Chemical Pvt. Ltd.
- **Ami aqua tester** transferred to M/s Glorisa Technovation India Private Limited
- **Rootonic** transferred to M/s Agriland
- **AI based software for male fertility detection** transferred to M/s APS Lifetech

5. Awards and Recognitions

- Amity University received **"Prestigious Academia Award"** during "India Defence Conclave" organised by The Economic Times in association with DRDO, Ministry of Defence, Government of India.
- Amity University received the prestigious **Intellectual Property Award** from Confederation of Indian Industry at IP Summit organized with Ministry of Electronics and Information Technology, NITI Aayog Official, and Office of The Controller General of Patents, Designs And Trademarks (CGPDTM).
- **Amity International School, Mayur Vihar**, New Delhi was awarded the **'National Intellectual Property Award 2023',** becoming the first recipient of **Jury Special Mention Award for "Atal Tinkering Laboratories, ATL."**
- The brilliant and dynamic faculty members of Amity Education Group have been bestowed with more than **139 awards, 60 fellowships/ travel grants and 100+ recognitions in the year 2023.**
- This includes **Pradhan Mantri Rashtriya Bal Puruskar Award 2023 in the Innovation category (School), Prof. B.M Johri Memorial Award 2022, Dr. Sarvepalli Radhakrishnan Academic Leadership Award 2023, Royal Society of London, SERB-SIRE, SERB – TARE, Indian Society of Agriculture Biochemists, Fulbright fellowship.**
- **Thirty-Four** Amity University faculty members figure in **top 2%** of Global Researchers from India, in the list compiled by Stanford University, USA.

6. Research enrichment initiatives

- The research endeavors have been strengthened further through 70+ research centers and Centres of Excellence in niche areas established across Amity Universe.
- 12 Thematic Clusters are functional with the focus on the interdisciplinary research and innovations in Science & Technology to promote research in areas of global focus as well as to promote transdisciplinary and multidisciplinary research.
- 22 Ramalingaswami re-entry, Ramanujan, DST-INSPIRE, SERB-SRS, Wellcome Trust Fellows are presently working at Amity.
- Amity University has bestowed 30 Honorary Doctorates and 37 Honorary Professorships in the year 2023.
- The group has organized more than 1000 webinars/ Lectures of global relevance. In addition to this, 200+ Conferences, Seminars, workshops and FDPs were organised in 2023.

Chapter – 1 FUNDED PROJECTS

1.1. Research plays a pivotal role in advancing knowledge, fostering innovation, and contributing to societal development. Amity University is committed to maintaining a vibrant research environment, fostering collaboration, and addressing global challenges through innovative research.

1.2. For strengthening the research ecosystem, the following organizations have been established for ensuring increase in the number of high-quality project proposal submission and sanction by promptly identifying funding opportunities, finding pertinent faculty, overseeing the preparation of high-quality proposals, and ensuring their technical implementation following sanction.

Amity Foundation for Science, Technology & Innovation Alliances (AFSTIA)

Amity Center for Developmental Cooperation and Alliances (ACDCA)

In 2023, these departments were instrumental in the submission of 958 project applications to different funding organizations.

1.3. The ***Amity Directorate of Science & Innovation (ADSI)*** is entrusted with the administrative and financial management of research projects during their implementation.

1.4. The financial support received is critical in enabling our researchers to undertake impactful projects that address pressing challenges and contribute to academic excellence. The annual funding received for research reflects the dedication of our institution to contribute meaningfully to various fields.

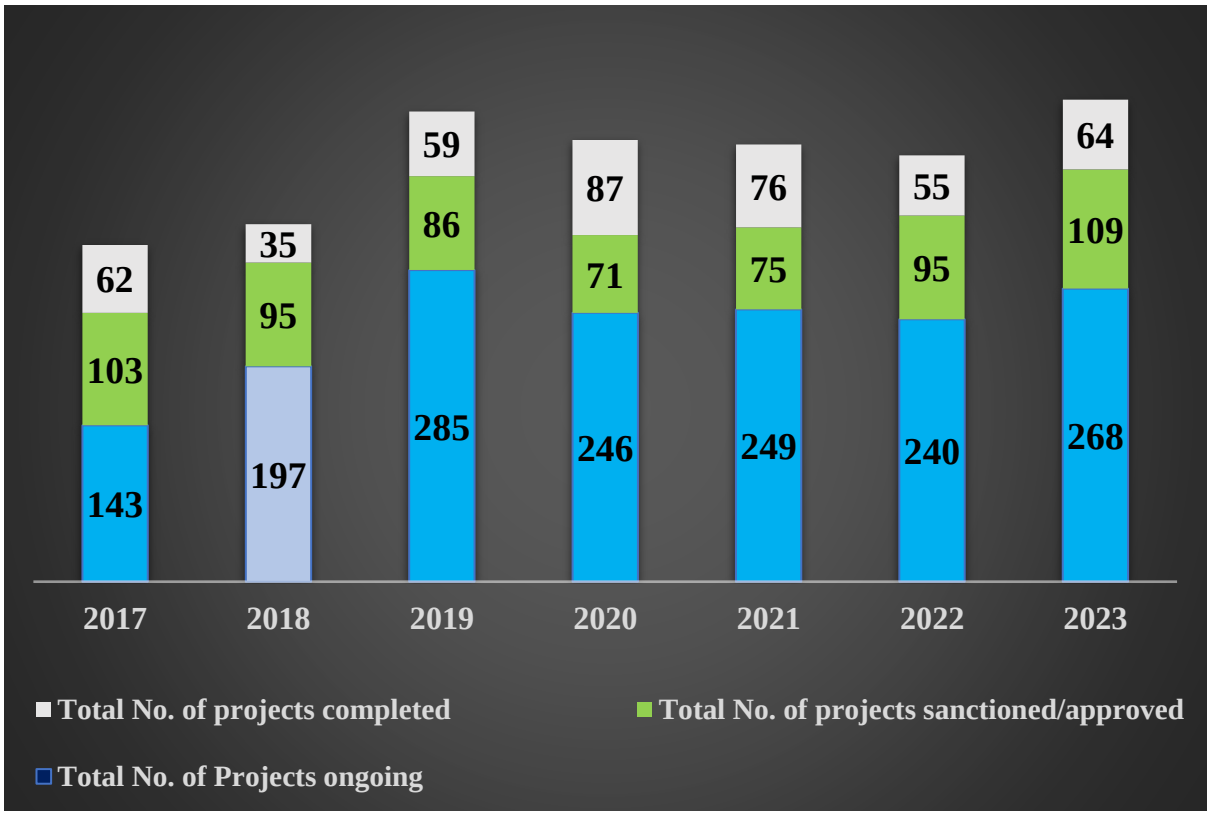
1.5. **A total of 109 projects were sanctioned during the year 2023 with a total cost of ₹ 29 Crores and 67 Lakhs.** The research funding for the annual year 2023 came from a diverse range of sources, including:

- **Government Grants:** 90% of the total funding involving projects aligned with global as well as National priorities was sourced from government grants from National and International agencies.

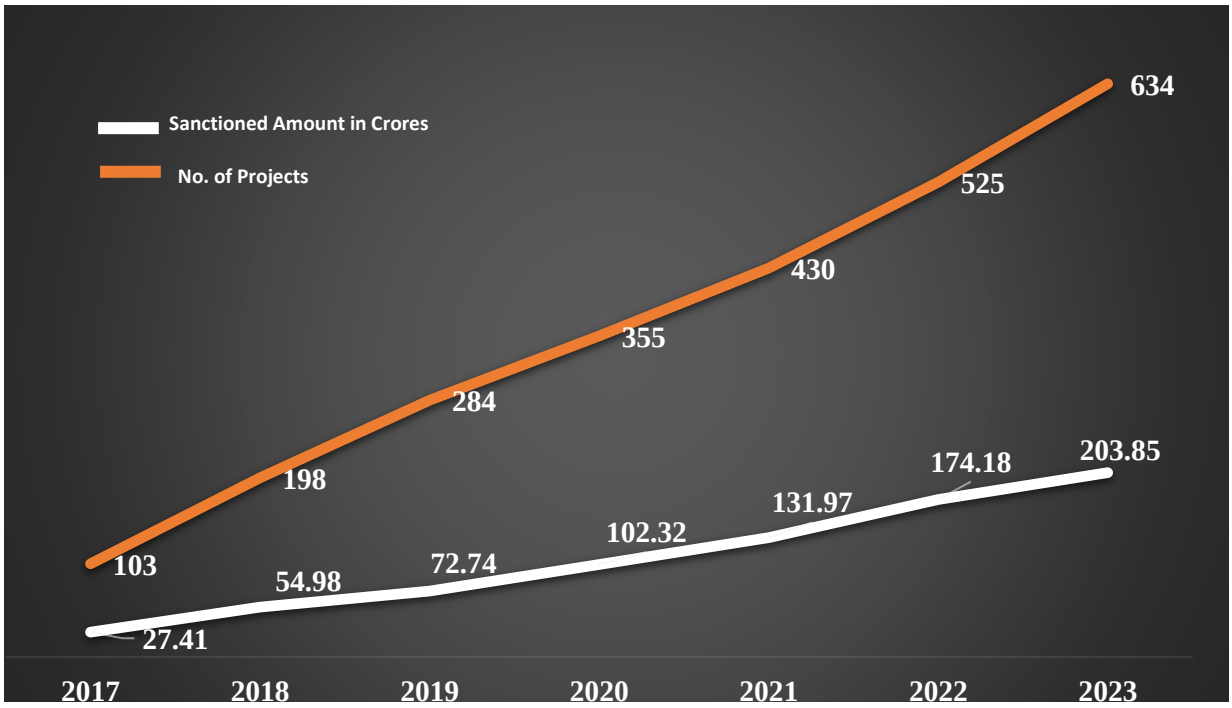
- **Industry Partnerships:** 10% of the funding resulted from collaborative initiatives with industry partners as well as from philanthropic foundations. These partnerships facilitate the transfer of knowledge, technology, and expertise between Academia and the Industry sector.

1.6. The summary of sanctioned, ongoing, and completed research projects funded by National & International funding agencies as well as industries during the year 2023 is as given below: -

Comparative Figures of all Amity campuses							
Year	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Total No. of Projects ongoing	**143**	**197**	**285**	**246**	**249**	**240**	**268**
Total No. of projects sanctioned/approved	**103**	**95**	**86**	**71**	**75**	**95**	**109**
Total No. of projects completed	**62**	**35**	**59**	**87**	**76**	**55**	**64**



1.7 The funds received from various agencies for undertaking research projects is depicted below:-



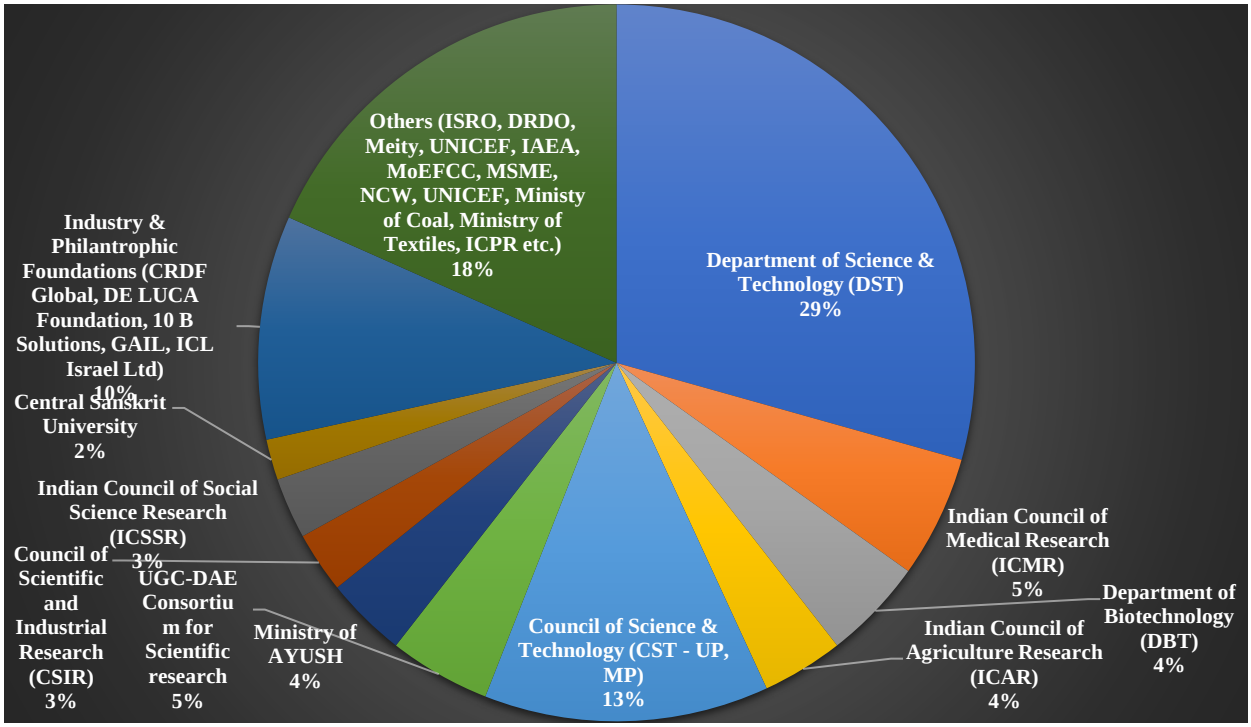
1.8 A total of 268 projects with a sanction amount of ₹ 112.10 Crores are being undertaken by our brilliant faculty members and researchers across Amity Universe. We have successfully completed 64 projects with a sanction amount of ₹ 19.38 Crore in the year 2023.

1.9 University wise details of projects in 2023 (Funded projects):-

Name of campus	Ongoing	Completed	Sanctioned
Amity University Noida	136	43	59
Amity University Haryana	36	8	12
Amity University Lucknow	11	6	5
Amity University Rajasthan	12	0	3
Amity University Madhya Pradesh	10	1	7
Amity University West Bengal	17	2	6
Amity University Chhattisgarh	13	0	4
Amity University Jharkhand	13	0	5
Amity University Bihar	1	0	0
Amity University Mumbai	11	3	4
Amity University Punjab	8	1	3
Amity University Greater Noida	0	0	1
Total	268	64	109

1.10 Funding agency wise projects sanctioned in 2023:

GRAPHICAL REPRESENTATION OF THE FUNDS RECEIVED FROM VARIOUS FUNDING AGENCIES



1.11 In addition to the research projects, Amity has received funds from Government agencies under prestigious schemes such as DST-FIST, DST-PURSE, DBT-BUILDER Programme which have supplemented the University's efforts towards development of World class R&D Labs.

DST-PURSE
AMITY UNIVERSITY RAJASTHAN

Amity University Rajasthan, Jaipur secured a research grant under the prestigious DST- Promotion of University Research and Scientific Excellence (PURSE) program. This funding has bolstered the university's research infrastructure and supported high quality research initiatives, fostering scientific advancement and innovation within the institution.

FE-SEM | GCMSMS | ICP-MS | ACTA FPLC

- Particle Analyzer Litesizer-500
- CD-Spectrometer
- Flow cytometer
- Spectrofluorometer


Confocal Microscope
Gel Doc System
Fermentor
HPLC
Scanning Electron Microscope
Ascend™ 400
Particle Size & Zeta Analyser
FACS
X-Ray Diffractometer
Electrochemical Analyser
Gas Chromatography
NMR 400MHZ

1.12 GLIMPSE OF HIGH VALUE RESEARCH PROJECTS SANCTIONED IN 2023

S. No.	Project Details	Principal Investigator
1.	**Project Title:** Grant-in-aid under the Component IV - Education, Training and Skill Development of National Technical Textiles Mission (NTTM) **Funding Agency:** Ministry of Textiles (MoT), Government of India **Sanctioned Amount:** ₹ 310 Lakhs **Sanctioned date:** 09-November-2023 **Duration:** 1 year	 **Dr. Balvinder Shukla** **Vice- Chancellor** **Amity University Uttar Pradesh – Noida**  **Dr. Pradeep Joshi** **Group Addl. Pro Vice Chancellor** **Amity University Uttar Pradesh – Noida**
2.	**Project Title:** Dissemination of mushroom production technology and promoting mushroom roduction on periurban areas of Eastern U.P **Funding Agency:** Agriculture Department Govt of UP under RKVY scheme **Sanctioned Amount:** ₹ 212 Lakhs **Sanctioned date:** 07-December-2023 **Duration:** 2 Years	 **Dr. Shalini Singh Visen** Amity Food & Agriculture Foundation **Amity University Uttar Pradesh – Lucknow**
3.	**Project Title:** Development of Novel Materials for Prophylactic, Diagnostic And Therapeutic Applications **Funding Agency:** Department of Science & Technology (DST) **Sanctioned Amount:** ₹ 150 Lakhs **Sanctioned date:** 19-Jan-2023 **Duration:** 5 Year	 **Prof. Seema R Pathak** **Head of Department, Professor** **Chemistry** **Amity University Haryana**

4.	**Project Title:** Ligand Tuned Nickel Catalyzed Allene Functionalization towards Synthesis of Bioactive Olefins: An Organometallic & Photocatalytic approach **Funding Agency:** Department of Science & Technology (DST) **Sanctioned Amount:** ₹ 119 Lakhs **Sanctioned date:** 15-Jun-2023 **Duration:** 5 years	 **Dr. Milan Bera** **Ramanujan Fellow** **Amity Institute of Click *Chemistry* Research & Studies** **Amity University Uttar Pradesh Noida**
5.	**Project Title:** The response of radiation belt Dropouts to Different Solar Drivers and Magneto sheath Transients **Funding Agency:** Department of Science & Technology (DST) **Sanctioned Amount:** ₹ 119 Lakhs **Sanctioned date:** 15-Jun-2023 **Duration:** 5 years	 **Dr. Sneha Gokani** **Associate Professor and Ramanujan Fellow** **Amity Institute of Biotechnology** **Amity University Maharashtra Mumbai**
6.	**Project Title:** Understanding Photo electrocatalytic Charge transfer Processes in CO_2 to Solar Chemical Fuel Conversion Using Carbon Dots: Towards Development of Metal Free Electrocatalyst **Funding Agency:** Department of Science & Technology (DST) **Sanctioned Amount:** ₹ 119 Lakhs **Sanctioned date:** 13-June-2023 **Duration:** 5 years	 **Dr. Sushant P Sahu** **Ramanujan Fellow** **Amity Institute of Biotechnology** **Amity University Maharashtra Mumbai**
7.	**Project Title:** Regulation of mitotic checkpoint function by NF-B and p53 signaling network: implications in genomic instability and carcinogenesis **Funding Agency:** Department of Biotechnology (DBT) **Sanctioned Amount:** ₹ 113 Lakhs **Sanctioned date:** 28-Dec-2023 **Duration:** 5 years	 **Dr Jayasha Shandilya** **Associate Professor & Ramalingaswami Fellow** **Amity Institute of Molecular Medicine & Stem Cell Research** **Amity University Uttar Pradesh Noida**

8.	**Project Title:** Application of Integrated Personal Omics Profiling in Treatment of Urolithiasis using Homeopathic Approaches **Funding Agency:** Ministry of AYUSH **Sanctioned Amount:** ₹ 98 Lakhs **Sanctioned date:** 22-Nov-2023 **Duration:** 3 Year	 **Prof. Chanderdeep Tandon** **Professor & Dean** **Amity School of Biological Sciences** **Amity University Punjab Mohali**
9.	**Project Title:** Project on 'Happiness' **Funding Agency**: Rekhi Foundation **Sanctioned Amount:** ₹ 81 Lakhs **Sanctioned date:** 26-July-23 **Duration:** 5 years	 **Prof. Manju Aggarwal** **Dean Student Welfare and Professor of Psychology** **Amity University Uttar Pradesh – Lucknow**
10.	**Project Title:** Technical Assistance to Mission Directorate JJM, PHED Chhattisgarh on strengthening monitoring capacities on JJM in 14 districts of Chhattisgarh **Funding Agency:** UNICEF **Sanctioned Amount:** ₹ 59.34 Lakhs **Sanctioned date:** 22-Feb-23 **Duration:** 1 year	 **Prof. (Dr.) Surendra N. Rahamatkar, DPVC, Dean & Director- ASET &** **Prof.(Dr.)Satyendra Patnaik** **Dean- Corporate Resources & Innovation Head |Amity Innovation Incubator- Raipur** **Amity University Chhattisgarh, Raipur**
11.	**Project Title:** High throughput Lipidomics of Mucorales (black fungus) to determine specific lipid fingerprints associated with their infection and drug resistance **Funding Agency:** Department of Science & Technology (DST) **Sanctioned Amount:** ₹ 54 Lakhs **Sanctioned date:** 11-Feb-23 **Duration:** 3 years	 **Dr. Rajendra Prasad** **Director AIB & AIISH and Dean ASAS, ASET & AIB** **Amity University Haryana Manesar**

12.	**Project Title:** Role of HDAC6 in regulating plasticity and function of M2 Tumor-associated macrophages: A Potential therapeutic approach to modulate chemoresistance in breast cancer **Funding Agency:** Department of Science & Technology (DST) **Sanctioned Amount:** ₹ 51 Lakhs **Sanctioned date:** 18-Dec-23 **Duration:** 3 years	 **Dr. Sonia Kapoor** **Associate Professor** **Amity Institute of Molecular Medicine & Stem Cell Research** **Amity University Uttar Pradesh Noida**
13.	**Project Title:** Development of a targeted intraocular neuroprotective sustained release Noval drug assembly for attenuation of retinal ganglion cell degeneration **Funding Agency:** Department of Science & Technology (DST) **Sanctioned Amount**: ₹50 Lakhs **Sanctioned date:** 10-Oct-23 **Duration:** 3 Years	 **Prof. (Dr) Tinku Basu** **Director & Professor** **Amity Center for Nanomedicine** **Amity University Uttar Pradesh Noida**
14.	**Project Title:** Towards developing 'zero-As' rice grains: A multigene engineering approach to limit root-to-shoot transport of As in rice **Funding Agency:** Department of Science & Technology (DST) **Sanctioned Amount:** ₹ 50 Lakhs **Sanctioned date:** 04-Jul-23 **Duration:** 3 Year	 **Dr. Surajit Bhattacharya** **Assistant Professor** **Amity Institute of Biotechnology** **Amity University West Bengal Kolkata**
15.	**Project Title:** Elucidating the Role of Lipid Deregulations in Immunogenic Cell Death in Response to Chemotherapy **Funding Agency:** Department of Science & Technology (DST) **Sanctioned Amount:** ₹ 45 Lakhs **Sanctioned date:** 06-Mar-23 **Duration:** 3 years	 **Dr. Ujjaini Dasgupta** **Professor, Amity Institute of Integrative Sciences and Health & Amity Institute of Biotechnology** **Amity University Haryana Manesar**

16.	**Project Title:** Detection of viral RNA by two-fold cyclic amplification method **Funding Agency**: Department of Science & Technology (DST) **Sanctioned Amount**: ₹ 45 Lakhs **Sanctioned date:** 06- Jul-23 **Duration:** 3 Years	 **Dr. Ankan Dutta Chowdhury** **Associate Professor & Ramalingaswami Fellow** **Amity Institute of Biotechnology** **Amity University West Bengal Kolkata**
17.	**Project Title:** Calcium-permeable ion channels as therapeutic targets to manage neuropathic pain (PFMS-CNA) **Funding Agency:** Department of Biotechnology (DBT) **Sanctioned Amount:** ₹ 43 Lakhs **Sanctioned date:** 28-Dec-2023 **Duration:** 3 years	 **Dr Jayasha Shandilya** **Associate Professor & Ramalingaswami Fellow** **Amity Institute of Molecular Medicine & Stem Cell Research** **Amity University Uttar Pradesh Noida**
18.	**Project Title:** Validation of Gingipain proteases as a biomarker for chronic periodontitis and its fast detection by electrochemical platform **Funding Agency:** Department of Biotechnology (DBT) **Sanctioned Amount:** ₹ 41 Lakhs **Sanctioned date:** 28-Feb-23 **Duration:** 3 years	 **Dr. Sheetal Shirodkar** **Assistant Professor** **Amity Institute of Biotechnology** **Amity University Uttar Pradesh Noida**
19.	**Project Title:** Electrostatic Deposition and Functionalization of Multiwalled Carbon Nanotubes (MWCNTs) for Sensitive & Selective Detection of Coal Mine Methane (CMM) **Funding Agency:** Ministry of Coal India **Sanctioned Amount:** ₹ 41 Lakhs **Sanctioned date:** 9-Feb-23 **Duration:** 3 Year	 **Dr. Prashant Shukla** **Assistant Professor. *Amity* Institute of Advanced Research & Studies (Meterials & Devices)** **Amity University Uttar Pradesh Noida**

1.13 HIGHLIGHTS OF RESEARCH WORK UNDERTAKEN IN THE YEAR 2023

BUDGET: $ 1,077,996
NUCLEAR SECURITY STATE OF ART LABORATORY

- Collaboration with Texas A & M University sponsored by DTRA, US
- Access to Indian Universities/ Institutions/ for Research
- Remotely access facility

Facilities created:

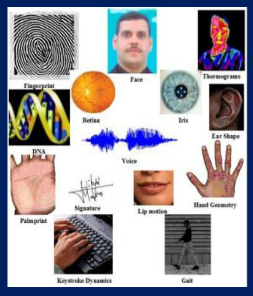
- ✓ Gamma Ray Spectrometers:
  - ➢ High Pure Ge Detector (HPGe)
  - ➢ NaI (Tl) Scintillation Detector
  - ➢ Cerium Bromide Scintillation Detector
- ✓ Neutron detector
- ✓ Alpha Ray Spectrometer
- ✓ Rate meter
- ✓ Neutron Meter (Area Monitor)
- ✓ Neutron Survey Meter
- ✓ Contamination Monitor
- ✓ Area Monitor Gamma/ Beta
- ✓ Portal Monitor

DRDO (Dare to Dream 2.0) :
AI based Identification of Person using Physiological parameters

FUNDING : 1 Cr INR

Project : Divya Drishti by Dr. Shivani Verma

- Design and development of an integrated approach for detecting a person by measuring:
  - ✓ Skeletal data,
  - ✓ Gait parameters
  - ✓ Face recognition parameters
  - ✓ Movement parameters (a new concept includes how a person moves /walks or stances taken)
- Intelligent inferencing system with LOW FALSE ALARM of recognition.

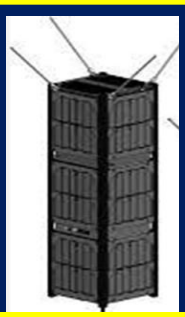


Product ready for Commercialisation

AMISAT

TO DEVELOP A MINIATURE SATELLITE SYSTEM

- **Basic Concept: Cube Sat Technology.**
- **Structure : 3 U (30 X10 X10 Cms).**
- **Orbit Parameter : Sun Synchronous 85-90◦ Inclination.**
- **Height : 300 -400 Kms (LEO)**
- **Power : Triple Junction Solar Array (Body Mtd).**

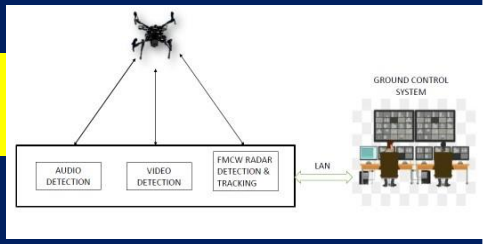


Amity Space Biology Experiment

Earth
bit

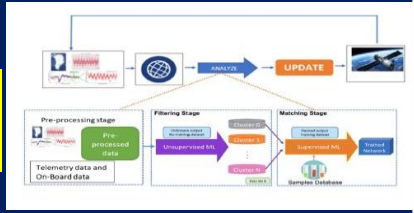
Amity Mars Analogue studies
Amity Astrobiology Research
2019- Ladakh, Lonar Crater

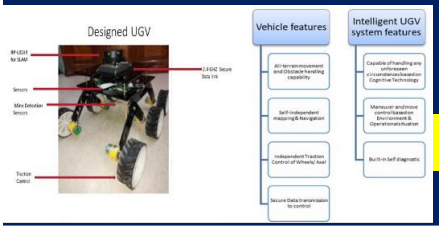
Drone Detection & Tracking System



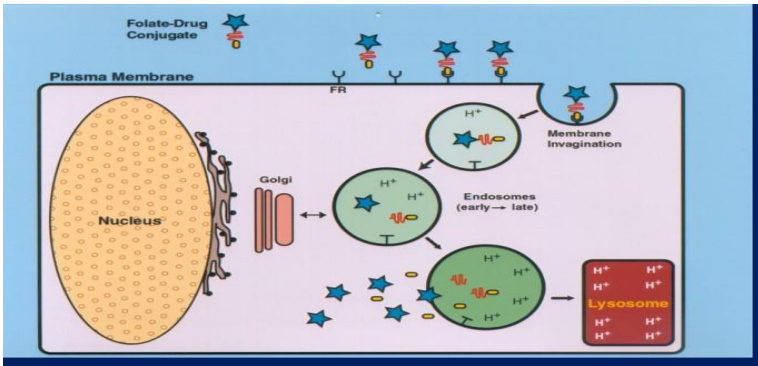
Swarm of CubeSats/ UAVs

Cognitive Health Monitoring of Spacecraft



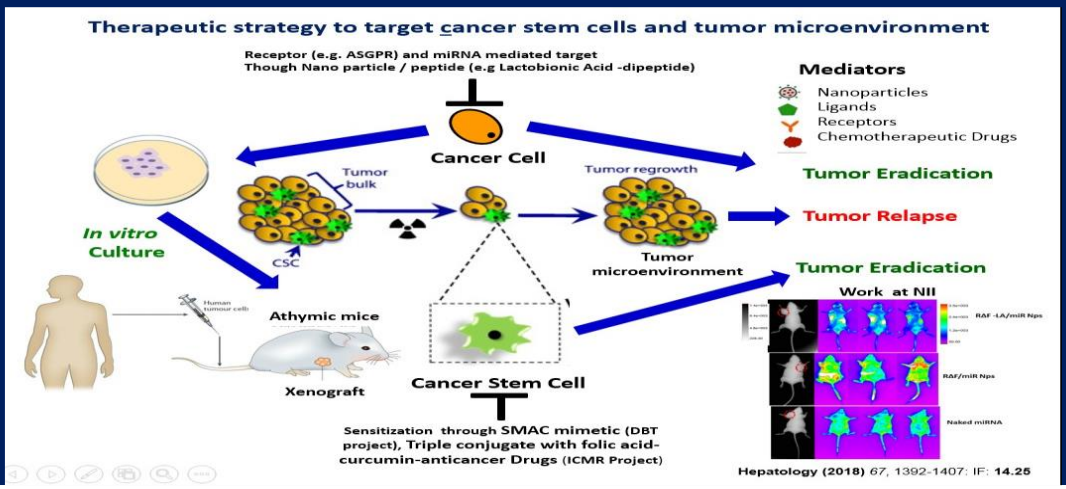


Intelligent UGV

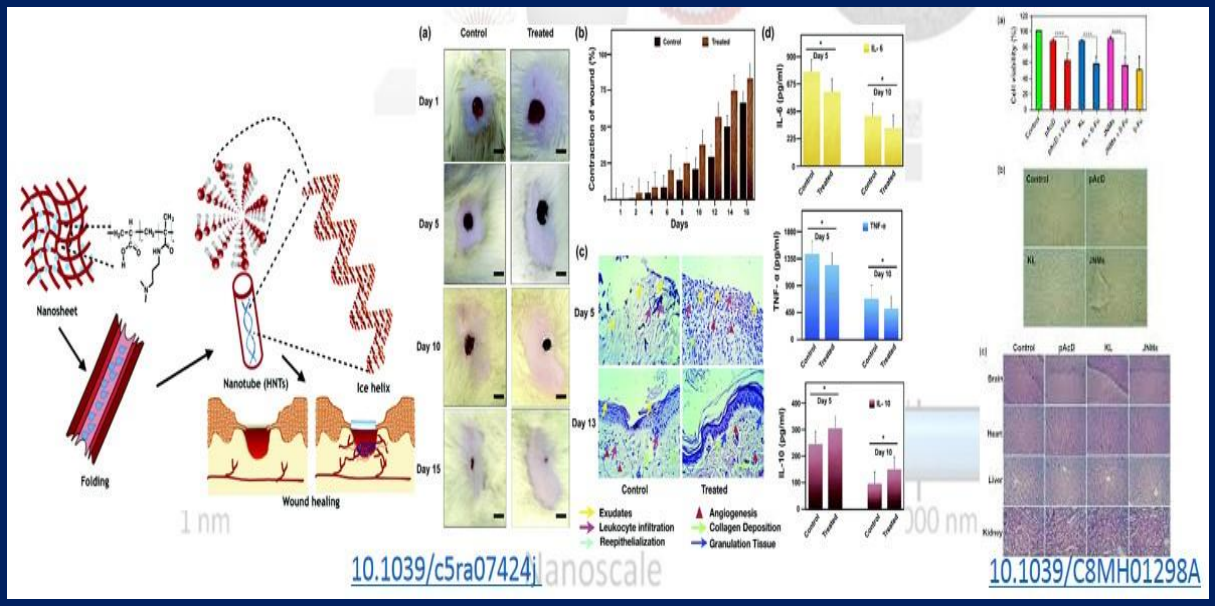


Intracellular Folate delivery of macromolecules to Tumors

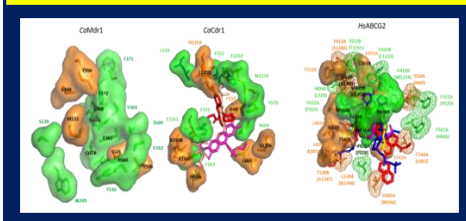
Targeted delivery of Curcumin to Cancer Cells by Triple Curcumin-Folate Conjugate



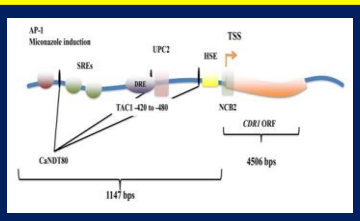
Biomolecules and their Nanocomposites for Drug delivery and Wound Healing



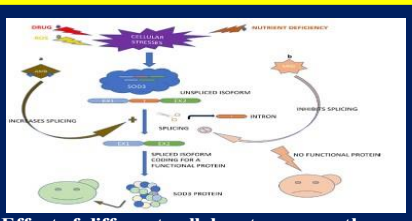
High throughput Lipidomics of Mucorales (black fungus) to determine specific lipid fingerprints associated with their infection and drug resistance



Structural basis for polyspecificity of multidrug efflux pumps

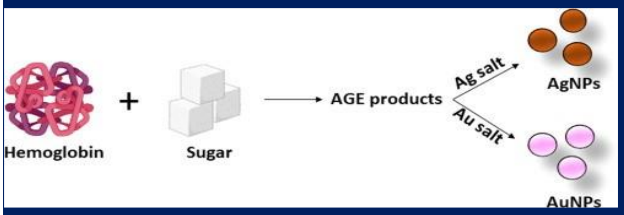


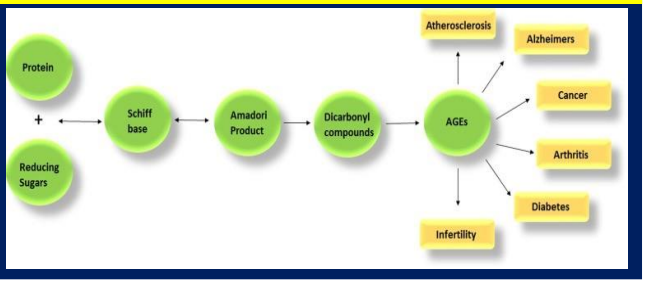
Cis Regulatory elements on CDR1 Promoter



Effect of different cellular stresses on the splicing of SOD3 gene in Candida albicans

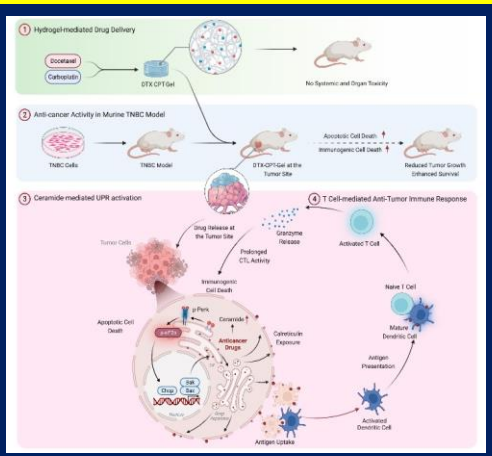
Development of Plasmonic Nano-sensor for Detection of AGE in Diabetic Patient Samples





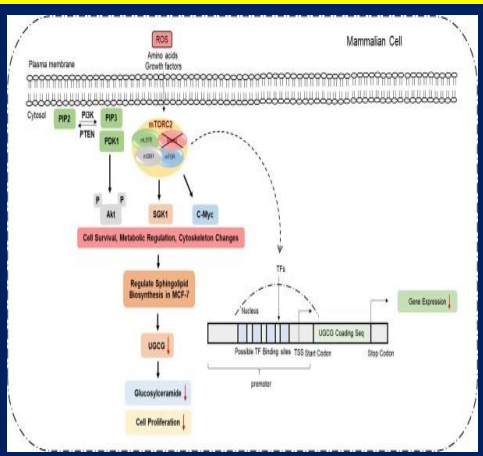
Decoding the Intricacies of Sphingolipid Signaling during Cancer and Liver Disease Progression

Elucidating the Role of Lipid Deregulations in Immunogenic Cell Death in Response to Chemotherapy



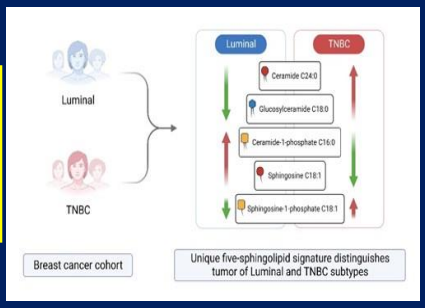
Impact of hydrogel-mediated delivery of DTX and CPT on apoptotic and immunogenic cell death in TNBC tumors

Elucidation of the Role of UDP-Glucose Ceramide Glucosyltransferase (UGCG) in mTORC2-Mediated Regulation of Sphingolipid Biosynthesis

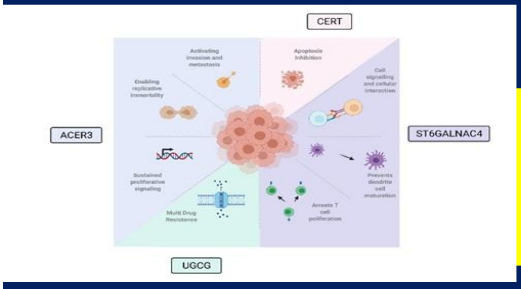


Diagrammatic representation of the mTORC2 pathway illustrating that mTORC2 regulates sphingolipid biosynthesis in mammalian breast cancer cells, like MCF7

Identification of Sphingolipid -based Biomarkers for Triple Negative Breast Cancer (TNBC) and Luminal A Patients and their Clinicopathological Correlation



Heat map showing representative sphingolipid profile from tissue taken from tumor of TNBC patients along with adjoining normal tissue

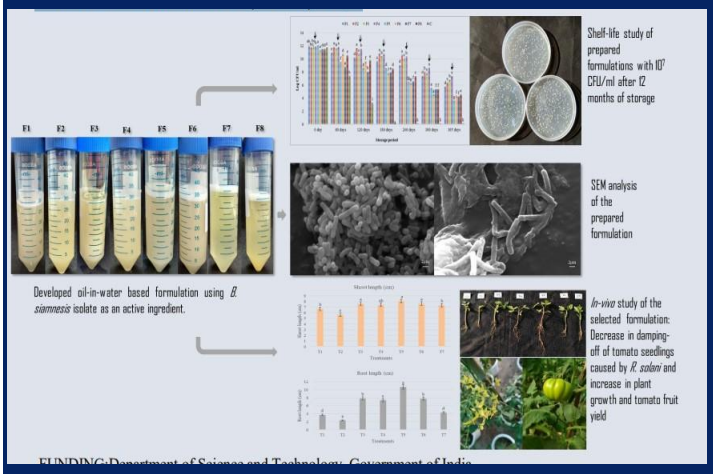


Research plan for identification and establishing alternatively spliced sphingolipids/gangliosides as diagnostic and markers for cancer

Elucidating the Role of Post-transcriptional Regulation of Sphingolipid Metabolic Genes in Breast Cancer Progression

DEPARTMENT OF SCIENCE & TECHNOLOGY
Funded Indo-Tunisia project : Diversity of tomato seed-bore endophytes and their application for the promotion of plant growth and defences against pathogens.

BACILLUS SIAMENSIS-BASED BIOSTIMULANT AND BIO-PESTICIDE FORMULATION



- Bio-pesticide liquid formulation of bacterial endophytic strain Bacillus siamensis.
- Strain produces produce antifungal biosurfactants such as Surfactin and Bacillomycin D.
- Shelf life of 12 months at room temperature.
- Reduce damping-off of tomato seedling by 60%.
- Increase tomato fruit yield by 58%.

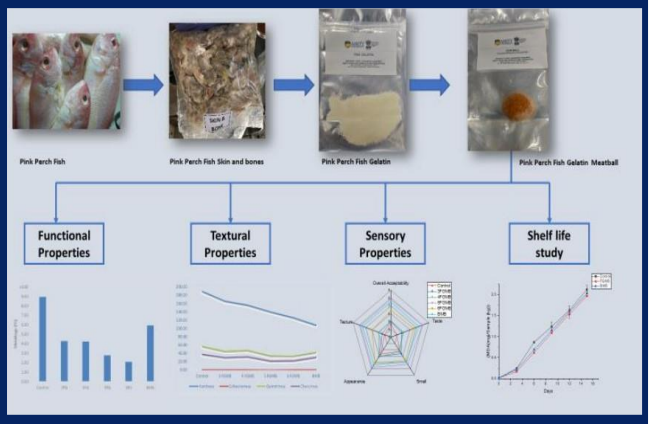
DEPARTMENT OF BIOTECHNOLOGY

Re-Value-EU-Inno-Indigo Bio-economy Project

Innovative technologies for improving resource utilization in the Indo - European fish value chains

LOW FAT READY TO COOK CHICKEN MEATBALLS USING FISH GELATIN EXTRACTED FROM FISH PROCESSING INDUTRY WASTE

- Chicken meatballs were prepared with gelatin-extracted Pink Perch skin and bones.
- Reduced fat content by 44%.
- Increased protein content by 37%.
- Reduced shrinkage by 69%.
- Imparted antioxidant activity.



DEPARTMENT OF BIOTECHNOLOGY

Re-Value-EU-Inno-Indigo Bio-economy Project

Innovative technologies for improving resource utilization in the Indo - European fish value chains

Protein Hydrolysate and Ready to Cook Soup from Fish Industry By-Products

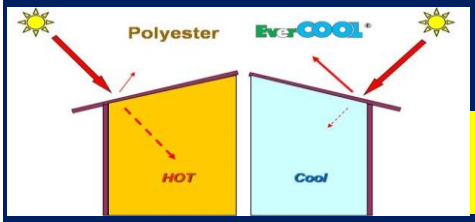
- India is one of the world's largest producer of fish which is exporting 13,77,244 MT of fish.
- 60% of the developing countries derives more than 30% of their animal protein from fish and constitute an important food component for a large section of the world population
- Large amounts of fish by-products (head, viscera, skin and bones) are being generated (approximately 50-60% of total fish capture) during fish processing.
- The formulation of Ready to cook (RTC) soup mixes rich in protein aid to fight against protein deficiency in the country.
- The Physio-chemical and sensory analysis of Ready to Cook soup mixes was conducted and observed that microencapsulated soup mixes contain approximately high amount of protein content (15%) with acceptable aroma and taste.
- These Ready to Cook soup powder can be potential alternative food for the protein deficient peoples.

DEPARTMENT OF BIOTECHNOLOGY

Re-Value-EU-Inno-Indigo Bio-economy Project

Innovative technologies for improving resource utilization in the Indo - European fish value chains

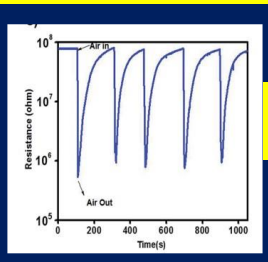
Protein Hydrolysate and Ready to Cook Soup from Fish Industry By-Products



Cool Coatings for Energy Efficient Buildings

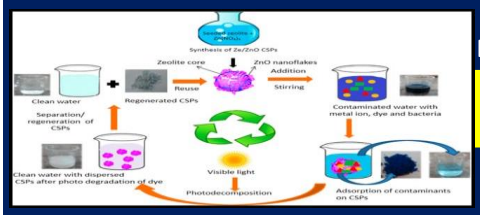
Modification of materials for their Use as Reflective Material in NIR Reflective Coatings for Energy Efficient Buildings

Conducting Polymer Nanocomposites as Sensors for Detection of Explosives



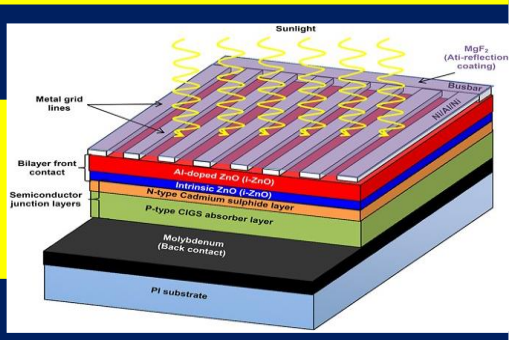
High Power Laser Absorption and Penetration in Metal Targets

Hand held Devices for selective Detection of Explosives



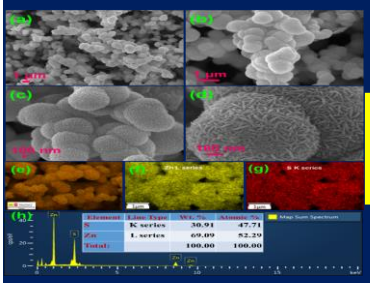
DST- WATER TECHNOLOGY INITIATIVE

Development of Smart Materials for Rapid and Sustainable Water Treatment



Modification in the chemical bath deposition setup, growth and characterization of semiconducting thin films for photovoltaic applications

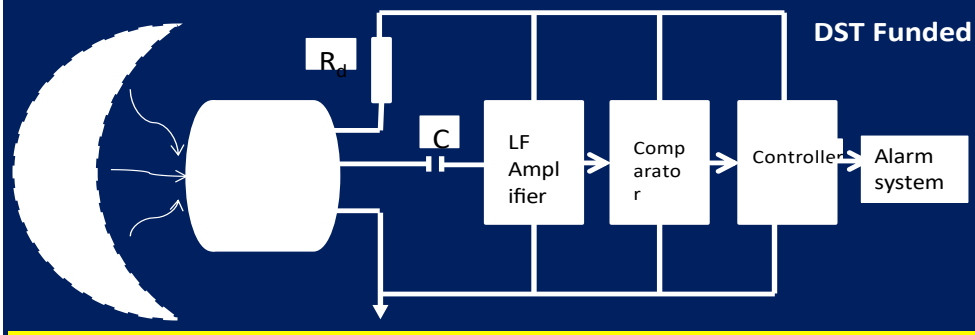
DST-SERB



Fabrication of low-cost Visible/ultraviolet sensor based on ZnS/p-Si heterojunction grown by chemical bath deposition

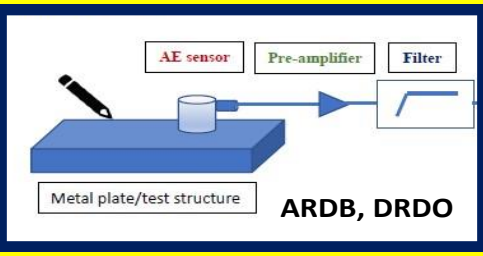
CST Funded

DST Funded



One of the largest value of pyroelectric coefficients reported so far at RT by our group

Development of lead-free pyroelectric ceramic-based mid-IR sensor for intruder detection



ARDB, DRDO

IAEA, AUSTRIA PROJECT

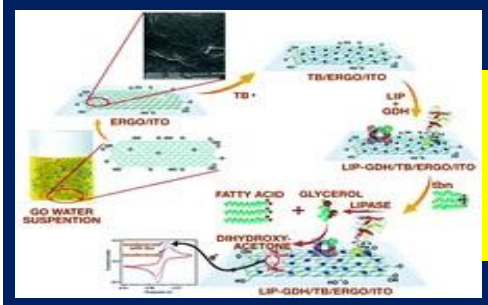
Development of doped barium zirconate titanate (BZT) based piezoelectric ceramics for acoustic emission sensor applications

Anion Exchange Membrane through Radiation Induced Grafting of Polymers for Fuel Cell Applications : Towards Cleaner Energy & Environment

SAXS studies of the dynamics of the stimulus responsive pores in Grafted Track Etched Membranes: a new paradigm for controlled Drug Delivery Applications

Interaction of electromagnetic wave with high energetic plasma in Uranus

Study of low-frequency plasma waves in the magnetosphere of Saturn



Bienzymatic reusable biosensors relied on graphene oxide for electrochemical sensing of Cholesterol and Triglyceride

Mobile app integrated Hand-Held Organophosphate Pesticide (OP) sensor

Natural polymer-based Gelatine free capsules

Chapter – 2 PUBLICATIONS

2.1 Publication, a mirror image of knowledge generation based on research and its dissemination for societal benefit has been at the core of scientists and researchers who pursue research activities tirelessly, and publish their work in reputed, peer-reviewed refereed journals indexed in Scopus and web of sciences.

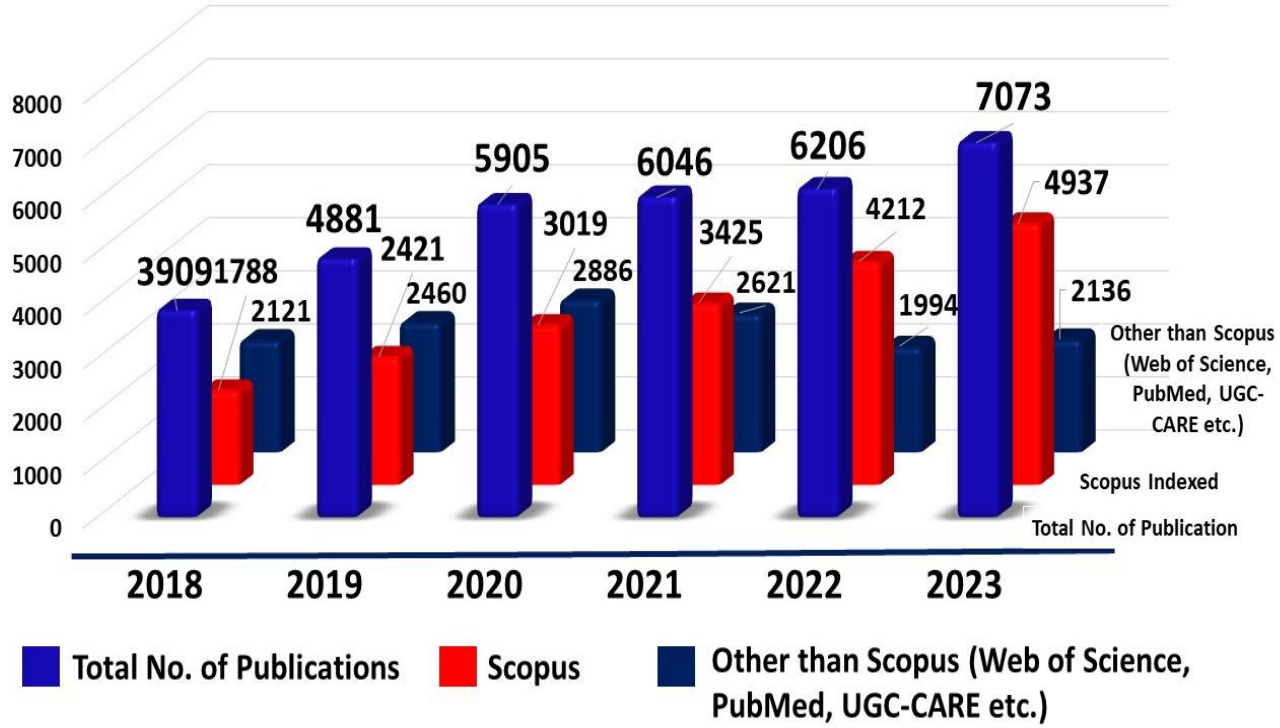
2.2 Enhancing the publications both qualitatively and quantitatively through strengthened research in order to contribute to global merit of the nation which is also the objective of Amity.

2.3 **This year a total of 7073 publications have been made, out of which over 300 are having an impact factor ranging from 6.0 to 168.9.**

2.4 **A Glimpse of data shared herein gives the summary of the number of Research Papers/ Books/ Book Chapters/ Papers in conference proceedings during the last 6 Years indicating the growth pattern in the Publication domain.**

Year	2018	2019	2020	2021	2022	2023
Total No. of Publication	3909	4881	5905	6046	6206	7073
Scopus Indexed	1788	2421	3019	3425	4212	4937
Other than Scopus (Web of Science, PubMed, UGC-CARE etc.)	2121	2460	2886	2621	1994	2136

GRAPHICAL REPRESENTATION OF YEAR-WISE GROWTH IN PUBLICATIONS



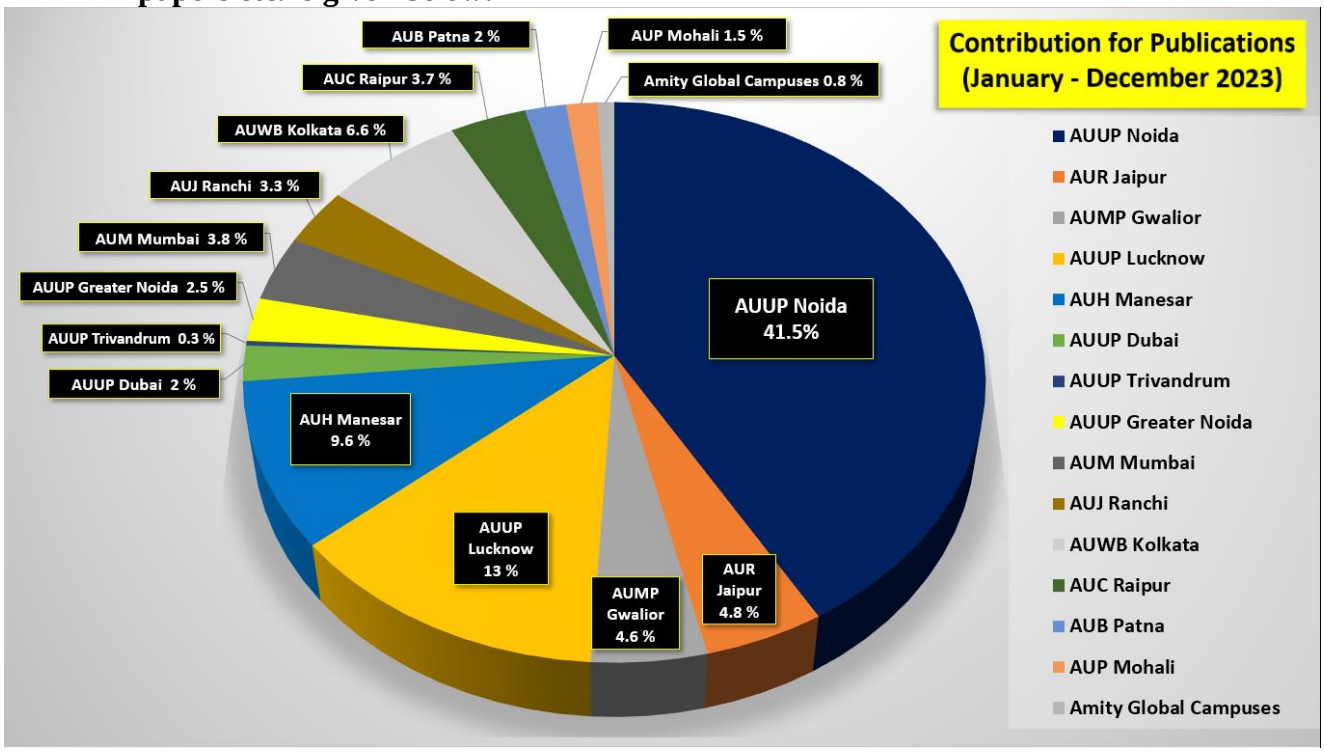
2.4 University wise No. of Publications						
Name of Campus	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
AMITY UNIVERSITY UTTAR PRADESH, NOIDA	**1765**	**2186**	**2579**	**2695**	**2644**	**2787**
AMITY UNIVERSITY UTTAR PRADESH, LUCKNOW CAMPUS	**275**	**373**	**575**	**548**	**478**	**871**
AMITY UNIVERSITY, RAJASTHAN	**404**	**295**	**242**	**311**	**403**	**321**
AMITY UNIVERSITY, MADHYA PRADESH	**314**	**236**	**209**	**227**	**203**	**309**

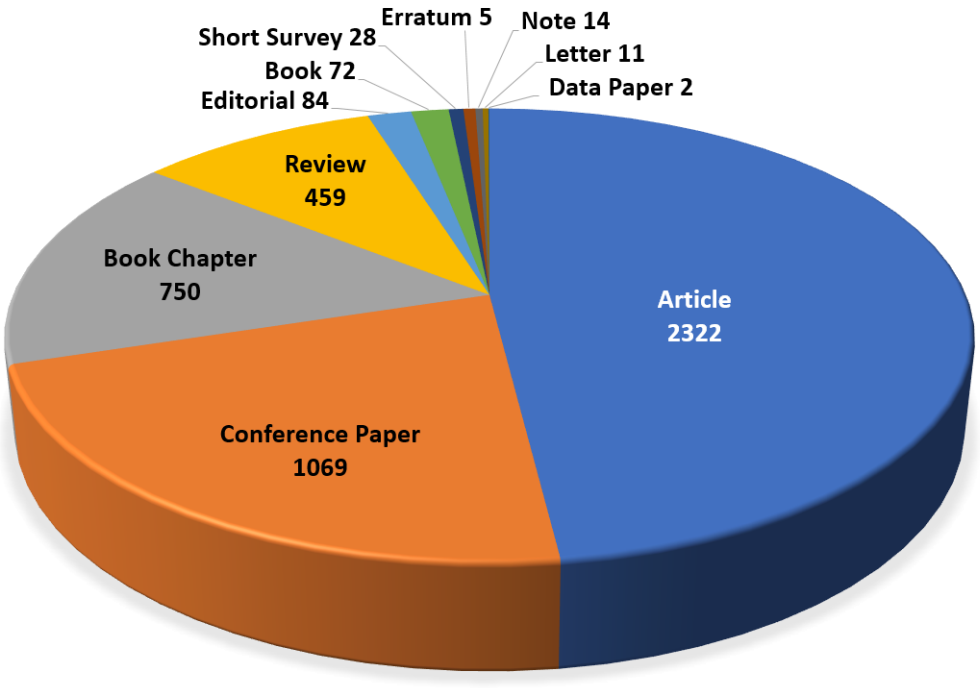
AMITY UNIVERSITY, HARYANA	**559**	**484**	**838**	**632**	**659**	**646**
AMITY UNIVERSITY, MUMBAI	**40**	**112**	**76**	**140**	**320**	**253**
AMITY UNIVERSITY, WEST BENGAL	**93**	**178**	**408**	**399**	**364**	**444**
AMITY UNIVERSITY, CHHATISGARH	**65**	**93**	**139**	**199**	**175**	**245**
AMITY UNIVERSITY, JHARKHAND	**3**	**38**	**110**	**84**	**135**	**224**
AMITY UNIVERSITY, BIHAR	**7**	**55**	**101**	**82**	**105**	**132**
AMITY UNIVERSITY, PUNJAB	**-**	**-**	**-**	**11**	**45**	**100**
AMITY UNIVERSIRY, DUBAI	**78**	**140**	**125**	**143**	**92**	**137**
AMITY UNIVERSITY, GREATER NOIDA	**33**	**71**	**99**	**135**	**141**	**169**
AMITY TRIVANDRUM	**10**	**13**	**3**	**1**	**1**	**18**
AMITY GLOBAL BUSINESS SCHOOLS	**230**	**377**	**369**	**433**	**397**	**363**
AMITY CAMPUSES OVERSEAS	**0**	**0**	**32**	**6**	**44**	**54**
TOTAL	**3909**	**4651**	**5905**	**6046**	**6206**	**7073**

Contribution of each University towards Mega Mission Publications during the year 2023

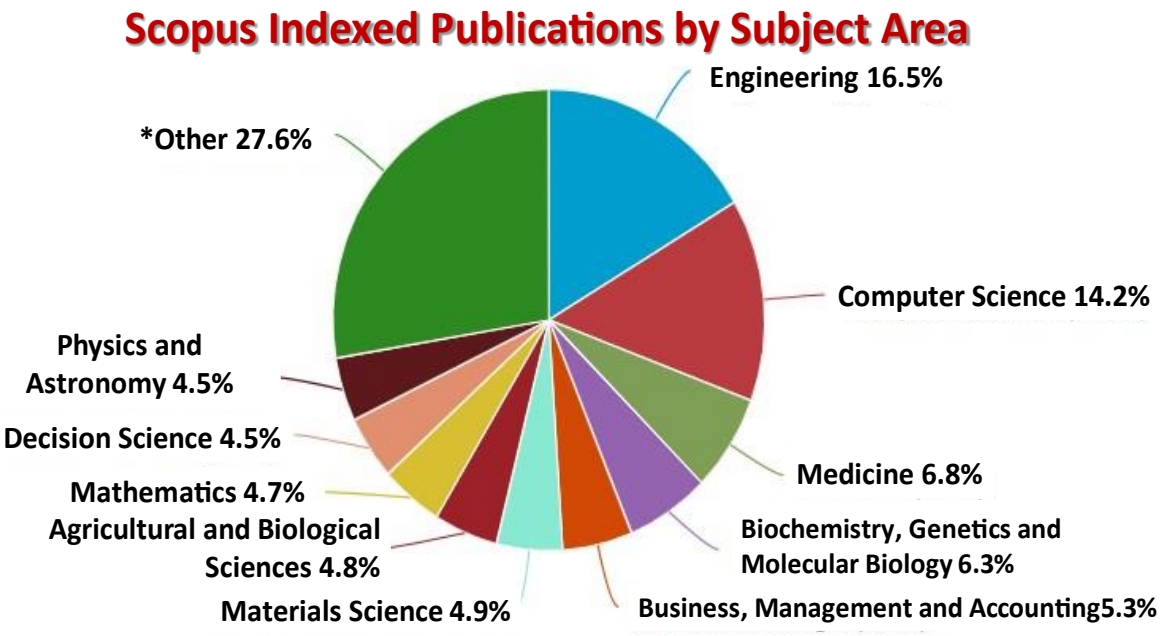
2.5 Analysis of Scopus indexed Publications for the year 2023

- **The percentage of the publications document wise such as Articles, Conference papers etc. is given below:**





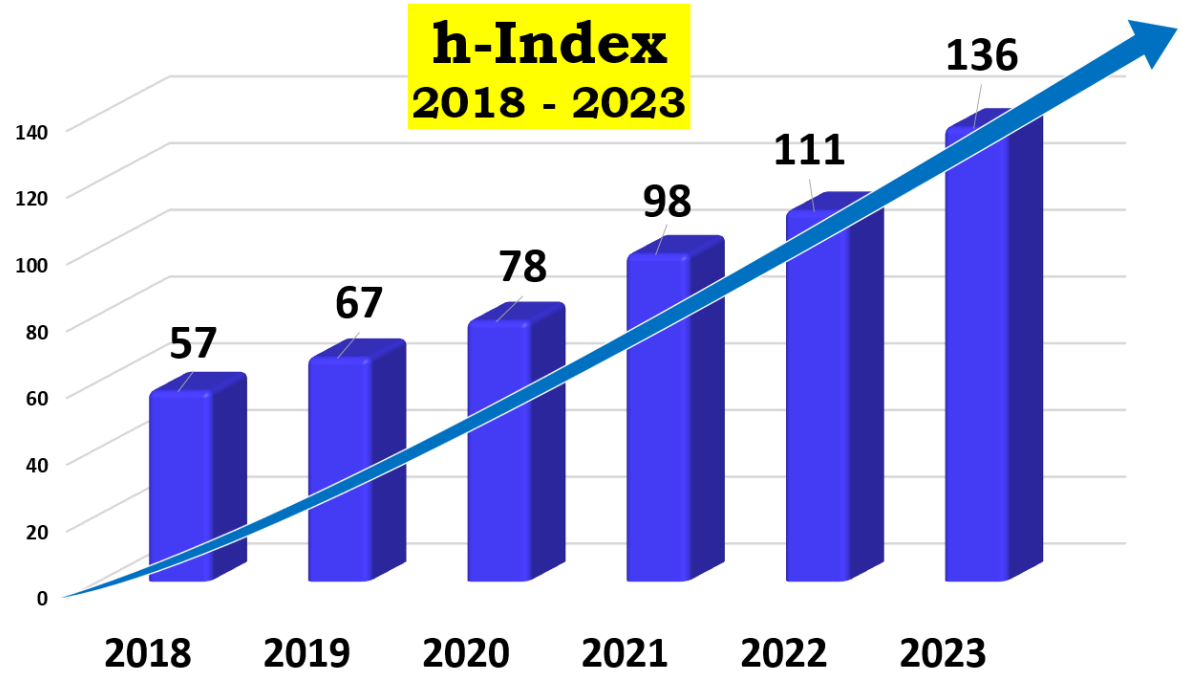
- **The subject-wise percentage of publications:**



***Others 27.6% (Chemistry, Environmental Science, Chemical Engineering, Pharmacology, Toxicology and Pharmaceutics, Social Sciences, Energy, Immunology and Microbiology, Economics, Econometrics and Finance, Earth and Planetary Sciences, Neuroscience, Multidisciplinary, Psychology, Health Professions, Arts and Humanities, Nursing, Veterinary, Dentistry)**

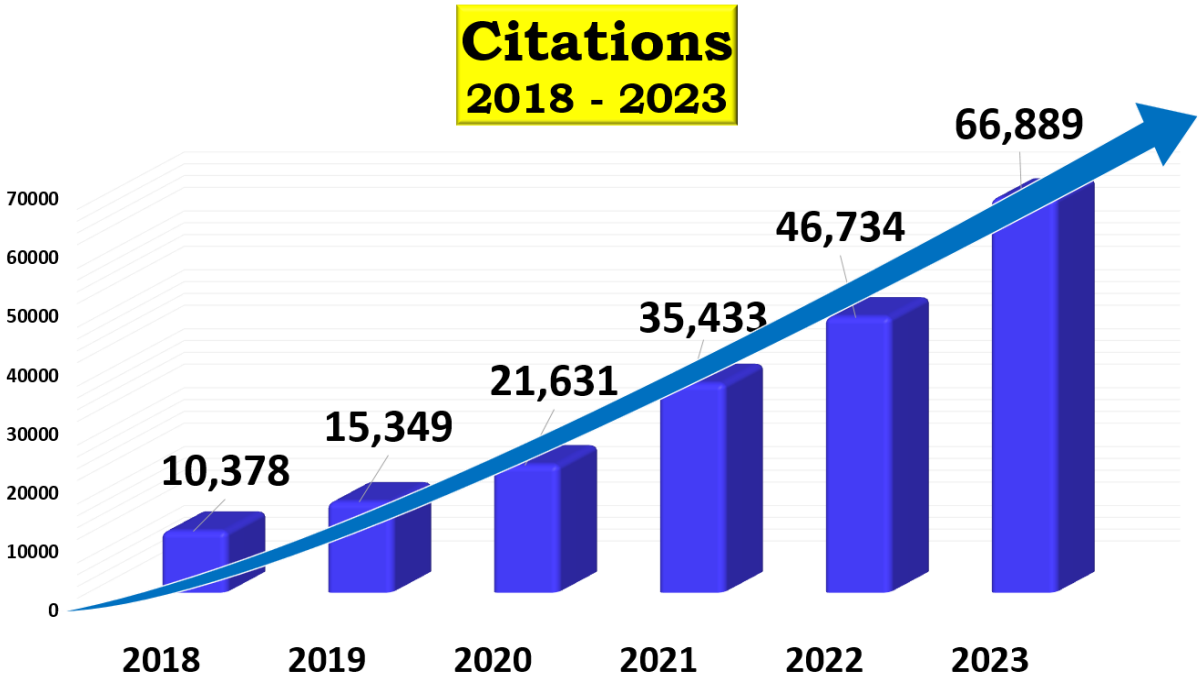
- **h-index of Amity Universities for the last 6 years:**

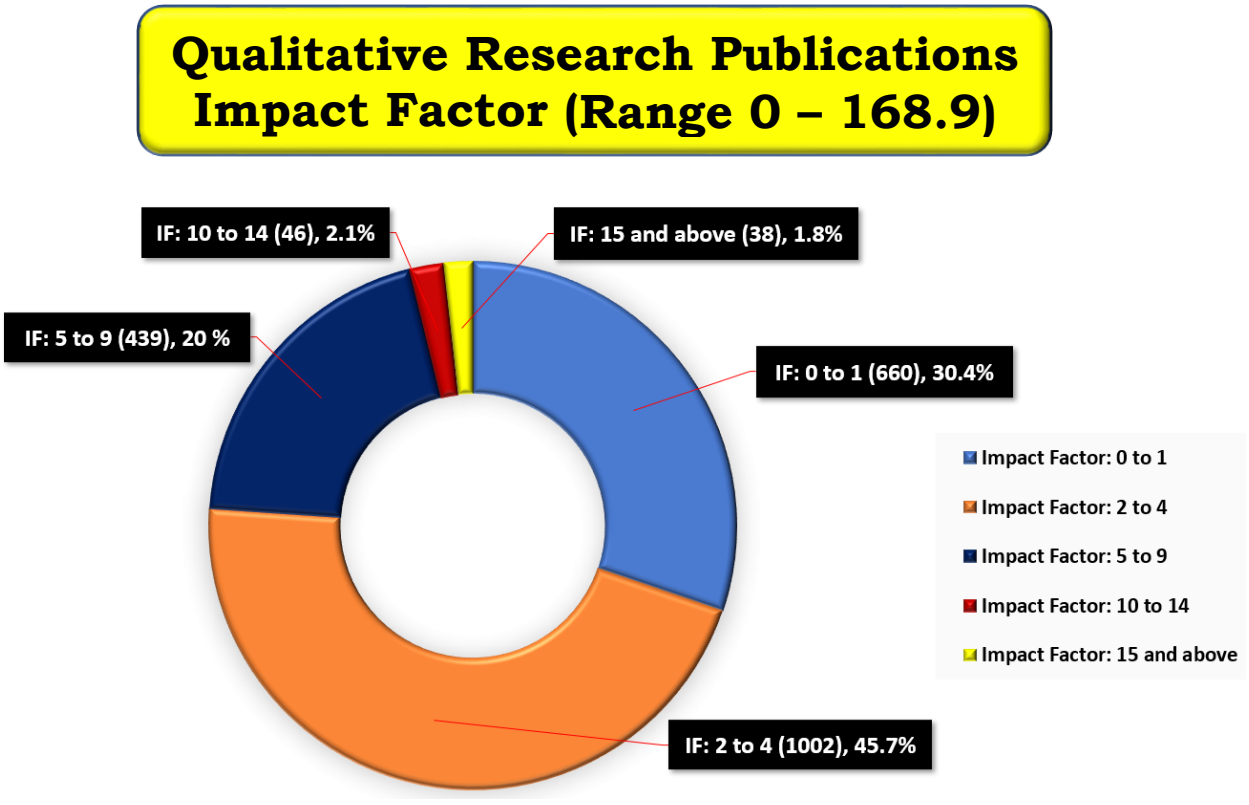
Year	2018	2019	2020	2021	2022	2023
h-index	57	67	78	98	111	136



2.6 **The citations of research publications by Amity faculty members/researchers as per Scopus for the last 6 years is depicted below:-**

Year	2018	2019	2020	2021	2022	2023
Citations	10,378	15,349	21,631	35,433	46,734	66,889





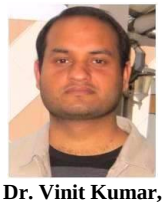
A GLIMPSE OF STAR PUBLISHERS (BASED ON IMPACT FACTOR)

S. No.	Publication	Photograph (Author/s)
1	**Title of paper:** Global, regional, and national burden of diabetes from 1990 to 2021, with projections of prevalence to 2050: a systematic analysis for the Global Burden of Disease Study 2021 **Name of Journal:** The Lancet **Impact Factor:** 168.9 **Name of Author/s:** Dr. Himanshu Khajuria, Dr. Biswa Prakash Nayak, M Shannawaz, H Kumar, E Upadhyay **Name of the Department/University:** AIFS, AIPH, AUUP, Noida & AIB, AU Rajasthan	 **Dr. Himanshu Khajuria AIFS, AUUP**  **Dr. Biswa P. Nayak AIFS, AUUP**  **Dr. M. Shannawaz, AIPH, AUUP**  **Dr. Harish Kumar, AIB, AUR**  **Dr. Era Upadhyay, AIB, AUR**
2	**Title of paper:** Global, regional, and national mortality due to unintentional carbon monoxide poisoning, 2000–2021: results from the Global Burden of Disease Study 2021 **Name of Journal:** The Lancet Public Health **Impact Factor:** 50 **Name of Author/s:** Dr. Biswa Prakash Nayak, Dr. Himanshu Khajuria, Dr. Naveen Kumar **Name of the Department/University:** AIFS, AUUP, Noida & AIB, AU Rajasthan	 **Dr. Himanshu Khajuria AIFS, AUUP**  **Dr. Biswa P. Nayak AIFS, AUUP**  **Dr. Naveen Kumar, AIB, AUR**
3	**Title of paper:** Global, regional, and national burden of meningitis and its aetiologies, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019 **Name of Journal:** The Lancet Neurology **Impact Factor:** 48 **Name of Author/s:** Dr. Himanshu Khajuria, Dr. Biswa Prakash Nayak, M Shannawaz **Name of the Department/University:** AIFS, AIPH, AUUP, Noida	 **Dr. Himanshu Khajuria AIFS, AUUP**  **Dr. Biswa P. Nayak AIFS, AUUP**  **Dr. M. Shannawaz, AIPH, AUUP**

4	**Title of paper:** Multifaceted role of mTOR (mammalian target of rapamycin) signaling pathway in human health and disease **Name of Journal:** Signal Transduction and Targeted Therapy **Impact Factor:** 39.3 **Name of Author/s:** Panwar V., Sengupta S., Garg M. **Name of the Department/University:** AIMMSCR, AUUP, Noida	 **Dr. Manoj Garg,** **AIMMSCR, AUUP**
5	**Title of paper:** Global investments in pandemic preparedness and COVID-19: development assistance and domestic spending on health between 1990 and 2026 **Name of Journal:** The Lancet Global Health **Impact Factor:** 38.927 **Name of Author/s:** Himanshu Khajuria, Biswa Prakash Nayak **Name of the Department/University:** AIFS, AUUP, Noida	 **Dr. Himanshu Khajuria** **AIFS, AUUP**  **Dr. Biswa P. Nayak** **AIFS, AUUP**
6	**Title of paper:** Global, regional, and national burden of low back pain, 1990–2020, its attributable risk factors, and projections to 2050: a systematic analysis of the Global Burden of Disease Study 2021 **Name of Journal:** The Lancet Rheumatology **Impact Factor:** 35.482 **Name of Author/s:** Shannawaz, M. **Name of the Department/University:** AIPH, AUUP, Noida	 **Dr. M. Shannawaz,** **AIPH, AUUP**
7	**Title of paper:** Global, regional, and national burden of rheumatoid arthritis, 1990–2020, and projections to 2050: a systematic analysis of the Global Burden of Disease Study 2021 **Name of Journal:** The Lancet Rheumatology **Impact Factor:** 35.482 **Name of Author/s:** Khajuria, H.; Nayak, B.P. **Name of the Department/University:** AIFS, AUUP, Noida	 **Dr. Himanshu Khajuria** **AIFS, AUUP**  **Dr. Biswa P. Nayak** **AIFS, AUUP**
8	**Title of paper:** The Global, Regional, and National Burden of Adult Lip, Oral, and Pharyngeal Cancer in 204 Countries and Territories: A Systematic Analysis for the Global Burden of Disease Study 2019 **Name of Journal:** JAMA Oncology **Impact Factor:** 28.4 **Name of Author/s:** Khajuria H., Nayak B.P. **Name of the Department/University:** AIFS, AUUP, Noida	 **Dr. Himanshu Khajuria** **AIFS, AUUP**  **Dr. Biswa P. Nayak** **AIFS, AUUP**
9	**Title of paper:** Prioritizing India's landscapes for biodiversity, ecosystem services and human well-being **Name of Journal:** Nature Sustainability **Impact Factor:** 27.157 **Name of Author/s:** Deomurari A. **Name of the Department/University:** AIFW, AUUP, Noida	 **Dr. Arpit Deomurari** **AIFW, AUUP**

10	**Title of paper:** Understanding the unceasing evolution of Co(II) based single-ion magnets **Name of Journal:** Coordination Chemistry Reviews **Impact Factor:** 24.833 **Name of Author/s:** Dr. Soumyabrata Goswami **Name of the Department/University:** AIAS, AUWB, Kolkata	 **Dr. Soumyabrata Goswami** **AIAS, AUK**
11	**Title of paper:** Global, regional, and national prevalence and mortality burden of sickle cell disease, 2000–2021: a systematic analysis from the Global Burden of Disease Study 2021 **Name of Journal:** The Lancet Haematology **Impact Factor:** 24.7 **Name of Author/s:** Dr. Biswa Prakash Nayak **Name of the Department/University:** AIFS, AUUP, Noida	 **Dr. Biswa P. Nayak** **AIFS, AUUP**
12	**Title of paper:** Prevalence, years lived with disability, and trends in anaemia burden by severity and cause, 1990–2021: findings from the Global Burden of Disease Study 2021 **Name of Journal:** The Lancet Haematology **Impact Factor:** 24.7 **Name of Author/s:** H Khajuria, B P Nayak, M Shannawaz, N Kumar **Name of the Department/University:** AIFS, AIPH, AUUP, Noida & AIB, AU Rajasthan	 **Dr. Himanshu Khajuria** **AIFS, AUUP**  **Dr. Biswa P. Nayak** **AIFS, AUUP**  **Dr. M. Shannawaz,** **AIPH, AUUP**  **Dr. Naveen Kumar,** **AIB, AUR**
13	**Title of paper:** Structure, function, and inhibition of catalytically asymmetric ABC transporters: Lessons from the PDR subfamily **Name of Journal:** Drug Resistance Updates **Impact Factor:** 24.3 **Name of Author/s:** Banerjee A., Prasad R. **Name of the Department/University:** AIB, AIISH, AU Haryana	 **Dr. Atanu Banerjee** **AIB, AUH**  **Dr. Rajendra Prasad** **AIB, AUH**

14	**Title of paper:** Global Burden of Cardiovascular Diseases and Risks, 1990-2022 **Name of Journal:** Journal of the American College of Cardiology **Impact Factor:** 24 **Name of Author/s:** Khajuria, Himanshu; Nayak, Biswa Prakash; Upadhyay, Era; Munjal, Kavita; Kumar, Naveen **Name of the Department/University:** AIFS, AIP, AUUP, Noida & AIB, AU Rajasthan	 **Dr. Himanshu Khajuria AIFS, AUUP**  **Dr. Biswa P. Nayak AIFS, AUUP**  **Dr. Era Upadhyay, AIB, AUR**  **Dr. Kavita Munjal AIP, AUUP**  **Dr. Naveen Kumar, AIB, AUR**
15	**Title of paper:** Nitric oxide working: no worries about heat stress **Name of Journal:** Trends in Plant Science **Impact Factor:** 22.012 **Name of Author/s:** Tripathi D.K. **Name of the Department/University:** AIOA, AUUP, Noida	 **Dr. D. K. Tripathi, AIOA, AUUP**
16	**Title of paper:** Unlocking a 'lock–key' mechanism governing pollen–pistil interactions **Name of Journal:** Trends in Plant Science **Impact Factor:** 22.012 **Name of Author/s:** Tripathi D.K. **Name of the Department/University:** AIOA, AUUP, Noida	
17	**Title of paper:** Nanocarrier spray: a nontransgenic approach for crop engineering **Name of Journal:** Trends in Plant Science **Impact Factor:** 22.012 **Name of Author/s:** Kandhol N., Tripathi D.K. **Name of the Department/University:** AIOA, AUUP, Noida	
18	**Title of paper:** Bacterial community and root endodermis: a complementary relationship **Name of Journal:** Trends in Plant Science **Impact Factor:** 22.012 **Name of Author/s:** Kandhol N., Pandey S., Tripathi D.K. **Name of the Department/University:** AIOA, AUUP, Noida	

19	**Title of paper:** COVID-19 vaccination may enhance hippocampal neurogenesis in adults **Name of Journal:** Brain, Behavior, and Immunity **Impact Factor:** 19.227 **Name of Author/s:** Dr. S. Kumar **Name of the Department/University:** AIB, AUM, Mumbai	 **Dr. Sujeet Kumar** **AIB, AUM**
20	**Title of paper:** Global burden of chronic respiratory diseases and risk factors, 1990–2019: an update from the Global Burden of Disease Study 2019 **Name of Journal:** The Lancet eClinicalMedicine **Impact Factor:** 17.033 **Name of Author/s:** H Khajuria, B P Nayak, M Shannawaz, N Kumar **Name of the Department/University:** AIFS, AIPH, AUUP, Noida & AIB, AU Rajasthan	 **Dr. Himanshu Khajuria** **AIFS, AUUP**  **Dr. Biswa P. Nayak** **AIFS, AUUP**  **Dr. M. Shannawaz,** **AIPH, AUUP**  **Dr. Naveen Kumar,** **AIB, AUR**
21	**Title of paper:** Global, regional, and national incidence of six major immune-mediated inflammatory diseases: findings from the global burden of disease study 2019 **Name of Journal:** The Lancet eClinicalMedicine **Impact Factor:** 17.033 **Name of Author/s:** Dr. Himanshu Khajuria, Dr. Biswa Prakash Nayak, Dr. Era Upadhyay **Name of the Department/University:** AIFS, AUUP, Noida & AIB, AU Rajasthan	 **Dr. Himanshu Khajuria** **AIFS, AUUP**  **Dr. Biswa P. Nayak** **AIFS, AUUP**  **Dr. Era Upadhyay,** **AIB, AUR**
22	**Title of paper:** Targeting monocarboxylate transporters (MCTs) in cancer: How close are we to the clinics? **Name of Journal:** Seminars in Cancer Biology **Impact Factor:** 17.012 **Name of Author/s:** Mamta Singh, Dolly Sharma, Rajat Gupta, Vinit Kumar **Name of the Department/University:** AIMMSCR, AIB, AUUP, Noida	 **Dr. Vinit Kumar,** **AIMMSCR, AUUP**
23	**Title of paper:** The metabolic crosstalk between PIN1 and the tumour microenvironment **Name of Journal:** Seminars in Cancer Biology **Impact Factor:** 17.012 **Name of Author/s:** Kumar V. **Name of the Department/University:** AIMMSCR, AUUP, Noida	

24	**Title of paper:** The emerging regulatory roles of non-coding RNAs associated with glucose metabolism in breast cancer **Name of Journal:** Seminars in Cancer Biology **Impact Factor:** 17.012 **Name of Author/s:** Samarth Kansara, Agrata Singh, Abhishesh Kumar Badal, Reshma Rani, Prakash Baligar, Manoj Garg, Amit Kumar Pandey **Name of the Department/University:** AIB, AU Haryana & AIB, AIMMSCR, AUUP Noida	 **Dr. Manoj Garg AIMMSCR, AUUP**  **Dr. Amit Kumar Pandey AIB, AUH**
25	**Title of paper:** Biosupercapacitors with minimized Self-Discharge **Name of Journal:** Chemical Engineering Journal **Impact Factor:** 16.744 **Name of Author/s:** Dey T., Dutta S. **Name of the Department/University:** AICCRS, AUUP, Noida	 **Dr. Saikat Dutta, AICCRS, AUUP**
26	**Title of paper:** Influence of catalase encapsulation on Cobalt@Nanoporous carbon with multiwall shell for supercapacitor and polyurethane synthesis using carbon dioxide **Name of Journal:** Chemical Engineering Journal **Impact Factor:** 16.744 **Name of Author/s:** Rahul Patil, Saikat Dutta **Name of the Department/University:** AICCRS, AUUP, Noida	
27	**Title of paper:** Green arginine capped Hafnium oxide nanoparticles, a computationally designed framework, for electrochemical sensing of mercury (II) ion **Name of Journal:** Chemical Engineering Journal **Impact Factor:** 16.744 **Name of Author/s:** Dr. Moondeep Chauhan **Name of the Department/University:** Central Instrument Lab, Amity University Punjab, Mohali	 **Dr. Moondeep Chauhan AUP, Mohali**
28	**Title of paper:** Humans and robots: Friends of the future? A bird's eye view of biomanufacturing industry 5.0 **Name of Journal:** Biotechnology Advances **Impact Factor:** 16 **Name of Author/s:** Abhyavartin Selvam, Monalisa Mukherjee **Name of the Department/University:** AINT, AICCRS, AUUP, Noida	 **Monalisa Mukherjee AICCRS, AUUP**

29	**Title of paper:** Revolutionizing clinical trials: the role of AI in accelerating medical breakthroughs **Name of Journal:** International journal of surgery (London, England) **Impact Factor:** 15.3 **Name of Author/s:** Munjal K. **Name of the Department/University:** AIP, AUUP, Noida	 **Dr. Kavita Munjal** **AIP, AUUP**
30	**Title of paper:** Electronic and Structural Engineering of Atomically Dispersed Isolated Single-Atom and Alloy Architectures **Name of Journal:** Small **Impact Factor:** 15.153 **Name of Author/s:** Rahul Patil, Tapan Dey, Saikat Dutta **Name of the Department/University:** AICCRS, AUUP, Noida	 **Dr. Saikat Dutta,** **AICCRS, AUUP**
31	**Title of paper:** A localized hydrogel-mediated chemotherapy causes immunogenic cell death via activation of ceramide-mediated unfolded protein response **Name of Journal:** Science advances **Impact Factor:** 14.957 **Name of Author/s:** Rajput K., Medatwal N., Mehta D., Sharma H., Sharma R.D., Dasgupta U. **Name of the Department/University:** AIISH, AU Haryana	 **Dr. Ujjaini Dasgupta,** **AIISH, AUH**
32	**Title of paper:** A Comprehensive Review on Vision-Based Violence Detection in Surveillance Videos **Name of Journal:** ACM Computing Surveys **Impact Factor:** 14.324 **Name of Author/s:** Obaidat, M.S. **Name of the Department/University:** ASET, AUUP, AUUP, Noida	 **Obaidat, Mohammad S,** **ASET, AUUP**
33	**Title of paper:** Assessing indicators of arsenic toxicity using variable fluorescence in a commercially valuable microalgae: Physiological and toxicological aspects **Name of Journal:** Journal of Hazardous Materials **Impact Factor:** 14.224 **Name of Author/s:** Das S. **Name of the Department/University:** AIMST, AIB, AUUP, Noida	 **Dr. Shagnika Das,** **AIMST, AIB, AUUP**
34	**Title of paper:** Comprehensive mechanisms of heavy metal toxicity in plants, detoxification, and remediation **Name of Journal:** Journal of Hazardous Materials **Impact Factor:** 14.224 **Name of Author/s:** Suprasanna, P. **Name of the Department/University:** ACNB, AIB, AUM, Mumbai	 **Dr. Suprasanna Penna,** **ASET, AUUP**

35	**Title of paper:** Prediction of transcript structure and concentration using RNA-Seq data **Name of Journal:** Briefings in bioinformatics **Impact Factor:** 13.994 **Name of Author/s:** Sharma H., Pani T., Dasgupta U., Sharma R.D. **Name of the Department/University:** AIISH, AU Haryana	 **Dr. Ravi Datta Sharma, AIISH, AUH**
36	**Title of paper:** Monkeypox re-emergence regulation in Ukraine through a strategic response plan: An update **Name of Journal:** International Journal of Surgery **Impact Factor:** 13.400 **Name of Author/s:** Dr. Sumira Malik **Name of the Department/University:** AIB, AU Jharkhand	 **Dr. Sumira Malik, AIB, AUJ**
37	**Title of paper:** An update on current understanding of the epidemiology and management of the re-emerging endemic Lassa fever outbreaks **Name of Journal:** International Journal of Surgery **Impact Factor:** 13.400 **Name of Author/s:** Malik S., Bora J., Kishore S. **Name of the Department/University:** AIB, AU Jharkhand	
38	**Title of paper:** SARS-CoV-2/Omicron subvariants: global outbreak upsurge and expected upcoming threats **Name of Journal:** International Journal of Surgery **Impact Factor:** 13.400 **Name of Author/s:** Sumira Malik, Jutishna Bora **Name of the Department/University:** AIB, AU Jharkhand	
39	**Title of paper:** Yellow fever virus, a mosquito-borne flavivirus posing high public health concerns and imminent threats to travellers - an update **Name of Journal:** International Journal of Surgery **Impact Factor:** 13.400 **Name of Author/s:** Malik S., Kishore S. **Name of the Department/University:** AIB, AU Jharkhand	
40	**Title of paper:** Ebola virus disease (EVD) outbreak re-emergence regulation in East Africa: preparedness and vaccination perspective **Name of Journal:** International Journal of Surgery **Impact Factor:** 13.400 **Name of Author/s:** Sumira Malik and Jutishna Bora **Name of the Department/University:** AIB, AU Jharkhand	

41	**Title of paper:** Blockchain-based solutions for mobile crowdsensing: A comprehensive survey **Name of Journal:** Computer Science Review **Impact Factor:** 12.9 **Name of Author/s:** Obaidat, M.S **Name of the Department/University:** ASET, AUUP, Noida	 **Obaidat, Mohammad S,** **ASET, AUUP**
42	**Title of paper:** Global, regional, and national burden of allergic disorders and their risk factors in 204 countries and territories, from 1990 to 2019: A systematic analysis for the Global Burden of Disease Study 2019 **Name of Journal:** Allergy: European Journal of Allergy and Clinical Immunology **Impact Factor:** 12.4 **Name of Author/s:** Himanshu Khajuria, Biswa Prakash Nayak, Era Upadhyay **Name of the Department/University:** AIFS, AUUP, Noida & AIB, AU Rajasthan	 **Dr. Himanshu Khajuria** **AIFS, AUUP**  **Dr. Biswa P. Nayak** **AIFS, AUUP**  **Dr. Era Upadhyay,** **AIB, AUR**
43	**Title of paper:** Molecular mechanism(s) of regulations of cancer stem cell in brain cancer propagation **Name of Journal:** Medicinal Research Reviews **Impact Factor:** 12.388 **Name of Author/s:** Agrawal K., Raj S., Kumar R., Kumar D. **Name of the Department/University:** AIMMSCR, AIB, AUUP, Noida	 **Dr Rajeev Kumar** **AIB, AUUP**
44	**Title of paper:** Addressing the resurgence of global monkeypox (Mpox) through advanced drug delivery platforms **Name of Journal:** Travel Medicine and Infectious Disease **Impact Factor:** 12 **Name of Author/s:** Sumira Malik **Name of the Department/University:** AIB, AU Jharkhand	 **Dr. Sumira Malik,** **AIB, AUJ**
45	**Title of paper:** Metabolomic response of microalgae towards diclofenac sodium during its removal from water and concomitant recovery of pigments and lipids **Name of Journal:** Bioresource Technology **Impact Factor:** 11.889 **Name of Author/s:** Sharma J., Joshi M., Nigam S. **Name of the Department/University:** AIB, AINT, AUUP, Noida	 **Dr. Subhasha Nigam** **AIB, AUUP**

46	**Title of paper:** Biomass valorization of agriculture wastewater grown freshwater diatom Nitzschia sp. for metabolites, antibacterial activity, and biofertilizer **Name of Journal:** Bioresource Technology **Impact Factor:** 11.889 **Name of Author/s:** Singh P.K., Saxena A., Tyagi R., Tiwari A. **Name of the Department/University:** AIB, AUUP, Noida	 **Dr. Archana Tiwari, AIB, AUUP**
47	**Title of paper:** Therapeutic potential of lipid nanosystems for the treatment of Parkinson's disease **Name of Journal:** Ageing Research Reviews **Impact Factor:** 11.788 **Name of Author/s:** Sumira Malik **Name of the Department/University:** AIB, AU Jharkhand	 **Dr. Sumira Malik, AIB, AUJ**
48	**Title of paper:** A Provably Secure Lightweight Key Agreement Protocol for Wireless Body Area Networks in Healthcare System **Name of Journal:** IEEE Transactions on Industrial Informatics **Impact Factor:** 11.648 **Name of Author/s:** Obaidat, M.S. **Name of the Department/University:** ASET, AUUP, Noida	 **Obaidat, Mohammad S, ASET, AUUP**
49	**Title of paper:** A novel comparison of energy-exergy, and sustainability analysis for biomass-fueled solid oxide fuel cell integrated gas turbine hybrid configuration **Name of Journal:** Energy Conversion and Management **Impact Factor:** 11.533 **Name of Author/s:** Shukla, A.K. **Name of the Department/University:** ASET, AUUP, Noida	 **Dr. Anoop Kumar Shukla ASET, AUUP**
50	**Title of paper:** Neo-vascularization-based therapeutic perspectives in advanced ovarian cancer **Name of Journal:** Biochimica et Biophysica Acta - Reviews on Cancer **Impact Factor:** 11.414 **Name of Author/s:** Prof. Manoj Garg **Name of the Department/University:** AIMMSCR, AUUP, Noida	 **Dr. Manoj Garg, AIMMSCR, AUUP**
51	**Title of paper:** Long non-coding RNAs: Fundamental regulators and emerging targets of cancer stem cells **Name of Journal:** Biochimica et Biophysica Acta - Reviews on Cancer **Impact Factor:** 11.414 **Name of Author/s:** Prof. Manoj Garg **Name of the Department/University:** AIMMSCR, AIP, AUUP, Noida	

52	**Title of paper:** Sustainable mixotrophic microalgae refinery of astaxanthin and lipid from Chlorella zofingiensis **Name of Journal:** Bioresource Technology **Impact Factor:** 11.4 **Name of Author/s:** Tiwari, A. **Name of the Department/University:** AIB, AUUP, Noida	 **Dr. Archana Tiwari, AIB, AUUP**
53	**Title of paper:** A review on MXene and its' composites for electromagnetic interference (EMI) shielding applications **Name of Journal:** Carbon **Impact Factor:** 11.307 **Name of Author/s:** Verma R., Thakur P., Thakur A. **Name of the Department/University:** ASAS, AINT, AU Haryana	 **Prof. Preeti Thakur ASAS, AUH**  **Prof. Atul Thakur AINT, AUH**
54	**Title of paper:** Hybrid coordination scheme based on fuzzy inference mechanism for residential charging of electric vehicles **Name of Journal:** Applied Energy **Impact Factor:** 11.2 **Name of Author/s:** Dr. Satheesh Abimannan **Name of the Department/University:** ASET, AUM, Mumbai	 **Dr. Satheesh Abimannan ASET, AUM**
55	**Title of paper:** Recent advances and future perspectives on nanoparticles-controlled alignment of liquid crystals for displays and other photonic devices **Name of Journal:** Critical Reviews in Solid State and Materials Sciences **Impact Factor:** 11.178 **Name of Author/s:** P P., Supreet, Singh G. **Name of the Department/University:** AIAS, AUUP, Noida & ASAS, AU Haryana	 **Dr. Gautam Singh AIAS, AUUP**
56	**Title of paper:** A review on 1D photonic crystal based reflective optical limiters **Name of Journal:** Critical Reviews in Solid State and Materials Sciences **Impact Factor:** 11.178 **Name of Author/s:** Dr. Ambika Devi **Name of the Department/University:** ASAS, AU Haryana	 **Dr Ambika Devi, ASAS, AUH**
57	**Title of paper:** Green human resource management in the context of organizational sustainability: A systematic review and research agenda **Name of Journal:** Journal of Cleaner Production **Impact Factor:** 11.072 **Name of Author/s:** Mansi Rastogi **Name of the Department/University:** ABS, AUWB, Kolkata	 **Dr. Mansi Rastogi ABS, AUWB, Kolkata**

58	**Title of paper:** Optimized oxygen deficient mesoporous barium doped cobalt oxide: A wonder material for green energy generation and storage **Name of Journal:** Journal of Cleaner Production **Impact Factor:** 11.072 **Name of Author/s:** Moondeep Chauhan **Name of the Department/University:** Central Instrument Lab, Amity University Punjab, Mohali	
59	**Title of paper:** A critical review on visible light active graphitic carbon nitride (g-CN) based photocatalyst for environment remediation application: A sustainable approach **Name of Journal:** Journal of Cleaner Production **Impact Factor:** 11.1 **Name of Author/s:** Dr. Moondeep Chauhan **Name of the Department/University:** Department of Environmental Sciences, Amity University, Punjab	 **Dr. Moondeep Chauhan** **AUP, Mohali**
60	**Title of paper:** Precursor-dependent fabrication of exfoliated graphitic carbon nitride (gCN) for enhanced photocatalytic and antimicrobial activity under visible light irradiation **Name of Journal:** Journal of Cleaner Production **Impact Factor:** 11.072 **Name of Author/s:** Moondeep Chauhan **Name of the Department/University:** Central Instrument Lab, Amity University Punjab, Mohali	
61	**Title of paper:** SYNTHESIS, CHARACTERISATION, IN SILICO MOLECULAR DOCKING STUDIES AND IN VIVO ANTI-INFLAMMATORY ACTIVITY OF SUBSTITUTED 4-THIAZOLIDINONE DERIVATIVES **Name of Journal:** Acta Biomedica **Impact Factor:** 11.036 **Name of Author/s:** Dr. Annie Gupta **Name of the Department/University:** AIP, AUUP, Noida	 **Dr. Annie Gupta** **AIP, AUUP**
62	**Title of paper:** Virtual screening and antimicrobial evaluation for identification of natural compounds as the prospective inhibitors of antibacterial drug resistance targets in Staphylococcus aureus **Name of Journal:** Fitoterapia **Impact Factor:** 11.036 **Name of Author/s:** Hitesh K Sharma, Puneet Gupta, Dheeraj Nagpal, Monalisa Mukherjee, Virinder S Parmar, Viney Lather **Name of the Department/University:** AIP, AICCRS, AUUP	 **Dr. Viney Lather** **AIP, AUUP**

63	**Title of paper:** Analysis of Industry 4.0 and circular economy enablers: A step towards resilient sustainable operations management **Name of Journal:** Technological Forecasting and Social Change **Impact Factor:** 10.884 **Name of Author/s:** Ramandeep Singh **Name of the Department/University:** AUUP, Noida	**Ramandeep Singh, AUUP**
64	**Title of paper:** From linear to a circular economy in the e-waste management sector: Experience from the transition barriers in the United Kingdom **Name of Journal:** Business Strategy and the Environment **Impact Factor:** 10.801 **Name of Author/s:** Dr. Vernika Agarwal **Name of the Department/University:** AIBS, AUUP, Noida	 **Dr. Vernika Agarwal, AIBS, AUUP**
65	**Title of paper:** Posterity of nanoscience as lipid nanosystems for Alzheimer's disease regression **Name of Journal:** Materials Today Bio **Impact Factor:** 10.761 **Name of Author/s:** Shristi Kishore, Sumira Malik **Name of the Department/University:** AIB, AU Jharkhand	 **Dr. Sumira Malik, AIB, AUJ**
66	**Title of paper:** Ecosystem services provided by striped hyenas in the human-dominated landscape of Rajasthan, India **Name of Journal:** Science of the Total Environment **Impact Factor:** 10.753 **Name of Author/s:** Panda D., Krishna J.S., Singh R. **Name of the Department/University:** AIFW, AUUP, Noida	 **Dr. Randeep Singh, AIES, AUUP**
67	**Title of paper:** Ruminal content biochar supplementation for enhanced biomethanation of rice straw: Focusing on biochar characterization and dose optimization **Name of Journal:** Science of the Total Environment **Impact Factor:** 10.753 **Name of Author/s:** Manish Kumar **Name of the Department/University:** AIES, AUUP, Noida	 **Manish Kumar, AIES, AUUP**
68	**Title of paper:** Microbial remediation and plant-microbe interaction under arsenic pollution **Name of Journal:** Science of the Total Environment **Impact Factor:** 10.753 **Name of Author/s:** Tripathi D.K. **Name of the Department/University:** AIOA, AUUP, Noida	 **Dr. D. K. Tripathi, AIOA, AUUP**

69	**Title of paper:** Nanozyme-based pollutant sensing and environmental treatment: Trends, challenges, and perspectives **Name of Journal:** Science of the Total Environment **Impact Factor:** 10.753 **Name of Author/s:** Umapathi A., Patel G., Patra C., Malik U., Daima H.K. **Name of the Department/University:** ACNN, AIB, AUR	 **Dr. Hemant Kumar Daima** **ACNN, AIB, AUR**
70	**Title of paper:** Coupling between Charge Density Wave Ordering and Magnetism in Ho2Ir3Si5 **Name of Journal:** Chemistry of Materials **Impact Factor:** 10.508 **Name of Author/s:** Dr Biplab Bag **Name of the Department/University:** AIAS, AU Jharkhand	 **Dr Biplab Bag** **AIAS, AU Jharkhand**
71	**Title of paper:** OeBAS and CYP716C67 catalyze the biosynthesis of health-beneficial triterpenoids in olive (Olea europaea) fruits **Name of Journal:** New Phytologist **Impact Factor:** 10.323 **Name of Author/s:** Thimmappa R. **Name of the Department/University:** AIGE, AUUP, Noida	 **Dr. Ramesha Thimmappa** **AIGE, AUUP**
72	**Title of paper:** Edge-Assisted Real-Time Instance Segmentation for Resource-Limited IoT Devices **Name of Journal:** IEEE Internet of Things Journal **Impact Factor:** 10.238 **Name of Author/s:** Obaidat, M.S. **Name of the Department/University:** ASET, AUUP, Noida	 **Obaidat, Mohammad S,** **ASET, AUUP**
73	**Title of paper:** Advances in the concept of functional foods and feeds: applications of cinnamon and turmeric as functional enrichment ingredients **Name of Journal:** Critical Reviews in Food Science and Nutrition **Impact Factor:** 10.2 **Name of Author/s:** Ashok Kumar Pathera **Name of the Department/University:** AIFT, AUUP, Noida	 **Dr. Ashok Kumar Pathera** **AIFT, AUUP**
74	**Title of paper:** Recent insights on tea metabolites, their biosynthesis and chemo-preventing effects: A review **Name of Journal:** Critical Reviews in Food Science and Nutrition **Impact Factor:** 10.2 **Name of Author/s:** Prof. (Dr.) Raghvendra Kumar Mishra **Name of the Department/University:** AIB, AUMP Gwalior	 **Prof. (Dr.) Raghvendra Kumar Mishra** **AIB, AUMP**

A GLIMPSE OF COLLABORATIVE PUBLICATIONS WITHIN AMITY UNIVERSE

A total of 194 collaborative publications were published within Amity Universe during 2023

S. No.	Name of the Institution/ University	Name of Faculty/ Scientist	Title of paper	Name of Journal	Impact Factor
1	AIFS, AIPH, AUUP, Noida & AIB, AU Rajasthan	Dr. Himanshu Khajuria, Dr. Biswa Prakash Nayak, M Shannawaz, N Kumar, E Upadhyay	Global, regional, and national burden of diabetes from 1990 to 2021, with projections of prevalence to 2050: a systematic analysis for the Global Burden of Disease Study 2021	The Lancet	Impact Factor: 168.9
2	AIFS, AUUP, Noida & AIB, AU Rajasthan	Dr. Biswa Prakash Nayak, Dr. Himanshu Khajuria, Dr. Naveen Kumar	Global, regional, and national mortality due to unintentional carbon monoxide poisoning, 2000–2021: results from the Global Burden of Disease Study 2021	The Lancet Public Health	Impact Factor: 50
3	AIFS, AIPH, AUUP, Noida & AIB, AU Rajasthan	H Khajuria, B P Nayak, N Kumar	Prevalence, years lived with disability, and trends in anaemia burden by severity and cause, 1990–2021: findings from the Global Burden of Disease Study 2021	The Lancet Haematology	Impact Factor: 24.7
4	AIFS, AIP, AUUP, Noida & AIB, AU Rajasthan	Khajuria, Himanshu; Nayak, Biswa Prakash; Upadhyay, Era; Munjal, Kavita; Kumar, Naveen	Global Burden of Cardiovascular Diseases and Risks, 1990-2022	Journal of the American College of Cardiology	Impact Factor: 24
5	AIFS, AIPH, AUUP, Noida & AIB, AU Rajasthan	H Khajuria, B P Nayak, M Shannawaz, N Kumar	Global burden of chronic respiratory diseases and risk factors, 1990–2019: an update from the Global Burden of Disease Study 2019	The Lancet eClinicalMedicine	Impact Factor: 17.033
6	AIFS, AUUP, Noida & AIB, AU Rajasthan	Dr. Himanshu Khajuria, Dr. Biswa Prakash Nayak, Dr. Era Upadhyay	Global, regional, and national incidence of six major immune-mediated inflammatory diseases: findings from the global burden of disease study 2019	The Lancet eClinicalMedicine	Impact Factor: 17.033
7	AIB, AU Haryana & AIB, AIMMSCR, AUUP Noida	S. Kansara, A. Singh, A. Kumar Badal, R. Rani, P. Baligar, M. Garg, A. K. Pandey	The emerging regulatory roles of non-coding RNAs associated with glucose metabolism in breast cancer	Seminars in Cancer Biology	Impact Factor: 17.012

8	AIFS, AUUP, Noida & AIB, AU Rajasthan	Himanshu Khajuria, Biswa Prakash Nayak, Era Upadhyay	Global, regional, and national burden of allergic disorders and their risk factors in 204 countries and territories, from 1990 to 2019: A systematic analysis for the Global Burden of Disease Study 2019	Allergy: European Journal of Allergy and Clinical Immunology	Impact Factor: 12.4
9	AICCRS, AINT, AIB, AUUP, Noida & AIP, AU Haryana	Kumar Shivam, A Selvam, Sujata Sangam, Misba Majood, Siddhartha Pahari, Ranjan Patra, Arun K. Sharma*, Monalisa Mukherjee*	Graphene quantum dots-hybrid hydrogel as an avant-garde biomimetic scaffold for diabetic wound healing	Biomaterials Advances	Impact Factor: 8.457
10	AIP, AU Haryana & AICCRS, AUUP, Noida	Lal S., Mukherjee M., Sharma A.K.	Molecular basis of phytochemical–gut microbiota interactions	Drug Discovery Today	Impact Factor: 7.4
11	AIP, AU Haryana & AICCRS, AIB, AUUP, Noida	Arun K. Sharma, Prof Monalisa Mukherjee, Ashish Kumar	Preliminary investigation on impact of intergenerational treatment of resveratrol endorses the development of ‘super-pups’	Life Sciences	Impact Factor: 6.780
12	AIAS, AUUP, Noida & ASAS, AU Haryana	Priscilla P., Supreet, Singh G.	Eco-friendly carbon dots induced thermally stable vertical alignment in planar anchored nematic liquid crystal	Journal of Molecular Liquids	Impact Factor: 6.633
13	AIISH, AU Haryana & AINN, AUUP, Noida	Prakash A., Kumar V.	Comprehensive mapping of mutations in TDP-43 and α-Synuclein that affect stability and binding	Journal of Biomolecular Structure and Dynamics	Impact Factor: 5.235
14	AIIT, ACIDR Noida & Amity University, Tashkent	Anjum M., Kapur P.K., Khatri S.K.	Analysis of vulnerability fixing process in the presence of incorrect patches	Journal of Systems and Software	Impact Factor: 3.514
15	AIMMSCR, AUUP, Noida & Amity Global School, Gurugram, Haryana	Kirti Agrawal, Saumya Chauhan & Dhruv Kumar	Expression analysis and regulation of GLI and its correlation with stemness and metabolic alteration in human brain tumor	3 Biotech	Impact Factor: 2.8

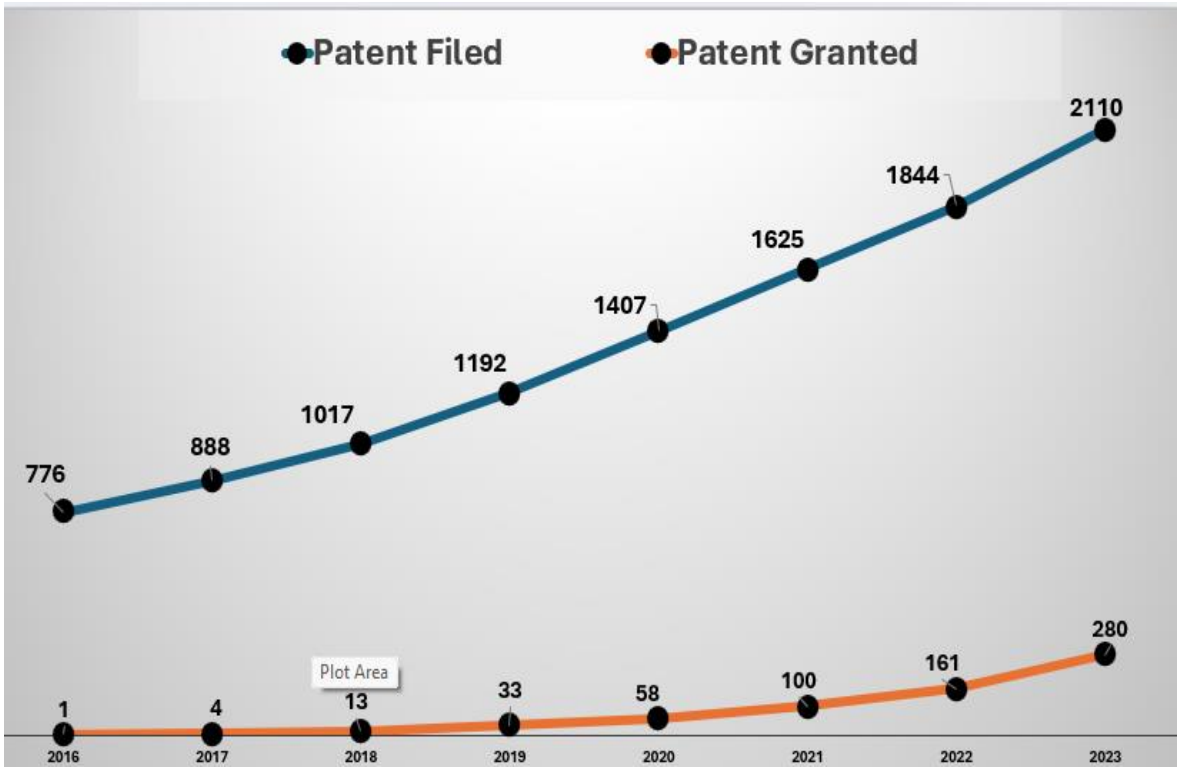
Chapter – 3 IPR GENERATED

(Patents, Copyrights & Trademarks)

IPR generation in any organisation is reflective of its ability and strength to generate originality of concept ideas and research.

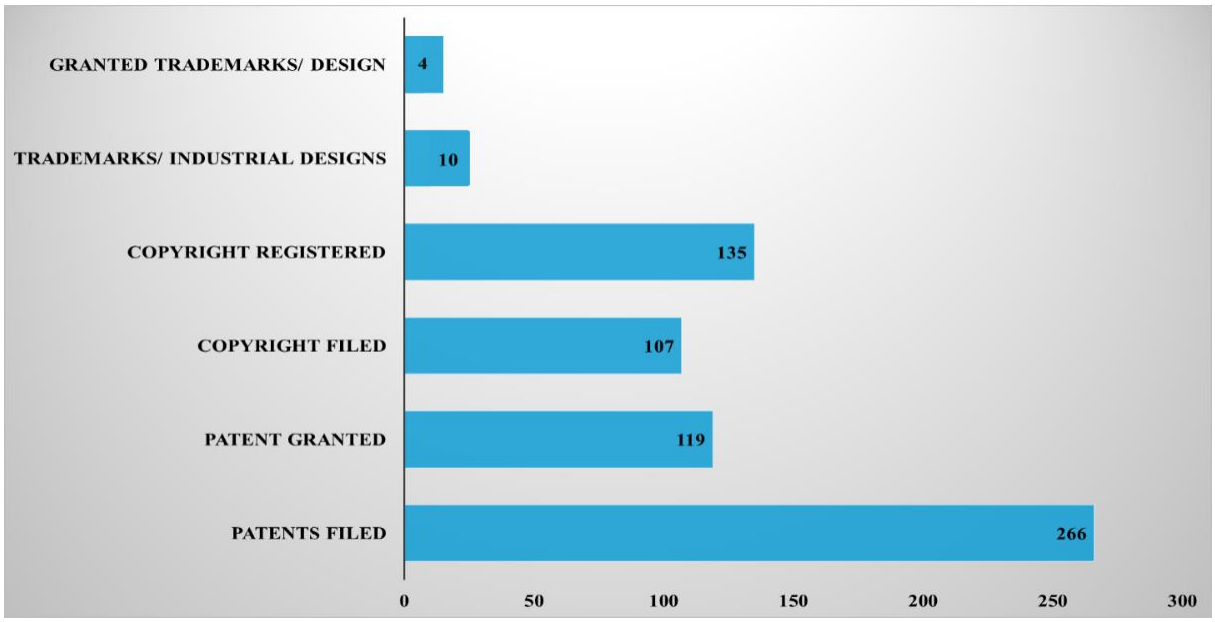
Amity University's annual IPR accomplishments demonstrate the commitment of the University to push the boundaries of innovation, and it has been instrumental in the creation of new knowledge and technology.

Recognized as one of the biggest national institutions for patent filing, Amity has filed **2110** patents as on December 31, 2023 out of which **280** have been granted. The patent filing and granted trend is shown below: -



Graphical representation of Patents filed & granted

3.1 GLIMPSE OF IPR GENERATED IN 2023

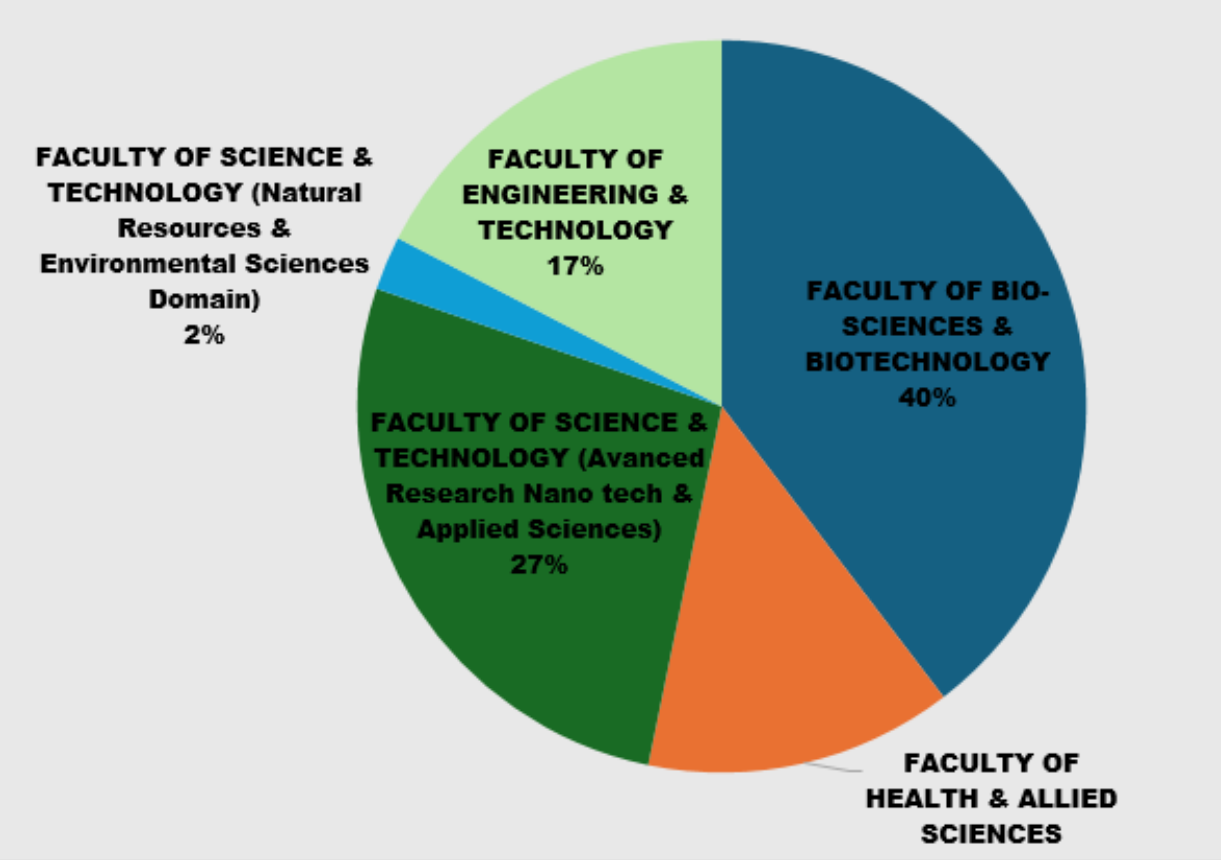


3.2 CAMPUS WISE PATENT FILING DURING 2023

CAMPUS NAME	PATENT FILED	PERCENTAGE CONTRIBUTION
AMITY UNIVERSITY UTTAR PRADESH - NOIDA	**120**	**45.11**
AMITY UNIVERSITY HARYANA - MANESAR	**29**	**10.90**
AMITY UNIVERSITY WEST BENGAL - KOLKATA	**23**	**8.65**
AMITY UNIVERSITY MADHYA PRADESH - GWALIOR	**16**	**6.02**
AMITY UNIVERSITY BIHAR - PATNA	**16**	**6.02**
AMITY UNIVERSITY CHHATISGARH - RAIPUR	**15**	**5.64**
AMITY UNIVERSITY UTTAR PRADESH - LUCKNOW	**13**	**4.89**
AMITY UNIVERSITY PUNJAB - MOHALI	**10**	**3.76**
AMITY UNIVERSITY UTTAR PRADESH - GREATER NOIDA	**8**	**3.01**
AMITY UNIVERSITY RAJASTHAN - JAIPUR	**6**	**2.26**

AMITY UNIVERSITY JHARKHAND - RANCHI	**2**	**0.75**
AMITY UNIVERSITY MAHARASTRA - MUMBAI	**2**	**0.75**
AMITY UNIVERSITY DUBAI	**1**	**0.38**
AMITY INTERNATIONAL SCHOOL - VASUNDHARA	**2**	**0.75**
AMITY INTERNATIONAL SCHOOL - SAKET	**1**	**0.38**
AMITY INTERNATIONAL SCHOOL - MAYUR VIHAR	**1**	**0.38**
AMITY INTERNATIONAL SCHOOL - GURUGRAM	**1**	**0.38**
	266	**100.00**

3.3 PATENT GRANTED - DOMAIN WISE



3.4 Glimpse of IPR Awards in 2023

- **Amity University** received the prestigious Intellectual Property Award from Confederation of Indian Industry at IP Summit organized by CII with Ministry of Electronics and Information Technology, NITI Aayog Official, and Office of The Controller General of Patents, Designs And Trade Marks (CGPDTM).

The award was given by Dr RA Mashelkar whose message to Amity many years ago was to focus on "Patent, Publish and Prosper", and Hon'ble Justice Prathiba Singh, the foremost legal authority on Intellectual Property.

- **Amity International School, Mayur Vihar, New Delhi** was awarded the **'National Intellectual Property Award 2023',** becoming the **first recipient of Jury Special Mention Award for "Atal Tinkering Laboratories, ATL"** category, by Shri Piyush Goyal, Union Minister of Commerce and Industry.

  The National Intellectual Property Award recognizes and rewards top achievers for their IP creations and commercialisation, contributing to the strengthening of IP eco-system and encouraging creativity.

Dr. Amita Chauhan, Chairperson & Dr. Atul Chauhan, President RBEF receiving the award

  Amity International School won in all five categories for its extensive work in STEM, including conducting numerous activities for students. The school's state-of-the-art Atal Tinkering Laboratory has the highest number of scientific instruments and facilities for video conferencing and meeting rooms.

- **Amity has received Funding approval from the scheme, KAPILA (Kalam Program for IP Literacy and Awareness) Assistance From MIC/AICTE, on Reimbursement Mode to recognize and felicitate the Intellectual Property, innovations, and best practices in HEIs. Under this scheme, as per KAPILA guideline, a maximum of 40 filed patent applications from October 15, 2021, onwards were eligible for funding under the 50% reimbursement mode.**

Chapter - 4 TECHNOLOGY TRANSFERRED

Research and Innovation has been the core focus area of the University with aim to develop products and ensure that it reaches to the society for ultimate use. With this as aim, Amity has established the Directorate of Innovation & Technology Transfer (DITT) as we believe that the technology transfer from academia holds significant importance as it helps in realizing the practical application of cutting-edge research findings, turning academic discoveries into tangible products, processes, or services that can benefit society at large.

The transfer of technology involves a two-way exchange of knowledge between academia and industry. Effective transfer of technology has also enhanced Amity's global competitiveness.

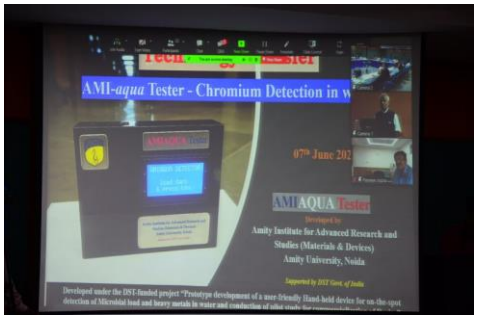
4.1 Amity has transferred 30+ technologies to the industry so far, out of which the following technologies have been transferred to the industries for commercialization in the year 2023 itself:

- **Novel Protease Enzyme** developed by **Dr Nidhee Chaudhary of Amity Institute of Biotechnology** was transferred to M/s **Balaji Enzyme & Chemical Pvt. Ltd.**

Dr. Nidhee Chaudhary, Professor, Amity Institute of Biotechnology, Noida and her team has developed 'Novel Protease Enzyme' that can be used in food and beverages industry, nutraceuticals, leather industry, detergent industry, pharmaceutical industry and cosmetics industry. Proteases are a group of enzymes that break the long chain-like molecules of proteins into shorter fragments and eventually into their components, amino acids. The global protease market size

was valued at $3,454.3 million in 2020 and is projected to reach $5,762.7 million by 2030. Ginger is the source of Proteases which are used in food and beverages industry, nutraceuticals, leather industry, detergent industry, pharmaceutical industry and cosmetics industry, to name a few. Since the Novel Protease Enzyme is highly active, up to 8 times more, it will help in reduction of the cost of manufacturing products.

- **Ami aqua tester for detection of chromium in water** developed by **Dr V.K. Jain, Amity Institute of Advanced Research and Studies (AIARS) (Materials and Devices), Noida** was transferred to **M/s Glorisa Technovation India Private Limited**



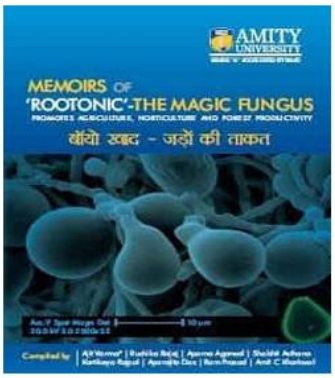
The widespread use of Chromium in tanning, corrosion control, plating, and pigment manufacturing, as well as by nuclear weapon producers, results in the release of highly toxic environmental pollutants. Amity facilitated development of a commercial- level prototype of Ami Aqua tester for detection of heavy metals in water. This is a platform technology which is presently programmed to detect Chromium only. 'Ami Aqua' is a portable, low-cost device with a minimum detection limit of 0.02 mg/L that provides both qualitative and quantitative results.

The event of transfer was attended by **Dr. Praveen Arora, Head, Water Technologies Cell, Department of Science & Technology, Govt. of India, who** averred that, "Since the year 2007, DST has been supporting the projects which are dedicated to find solutions to the existing problems and challenges of safe drinking water. Our prime focus is on providing safe drinking water and the device developed by Amity scientists is a smart handheld device which will detect the

presence of chromium, a harmful substance, in water. Dr. V.K. Jain and his team have done a remarkable work by developing this device and it is testimony of our commitment to enhance the quality of life of people and drive prosperity and growth for the society at large."

- **Rootonic** developed by **Prof. Ajit Varma of Amity Institute of Microbial Technology, Noida** was transferred to M/s Agriland

ROOTONIC is the magic fungus (Piriformospora indica) that promotes agriculture, horticulture by enhancing productivity and was discovered by Prof. (Dr.) Ajit Varma, Gp. Dy. VC / Distinguished Scientist & Professor of Eminence, Amity Institute of Microbial Technology. A number of green-house experiments and field trials were conducted in various parts of India including Punjab, Himachal Pradesh, Haryana, Gujarat, Karnataka, Delhi NCR and Rajasthan and extreme cold terrains of Leh-Ladakh with the fungus and the most astonishing part was that even fungus which was **screened from the extreme hot deserts functioned well** in extreme cold crops. The results showed a remarkable increase in productivity of various plants. This is unique symbiotic fungus which not only promotes plant growth but also has multi-functional activities including abiotic stress tolerance. This technology has helped in improving productivity per hectare as observed in a few experiments conducted by us over the years.



- **AI based software for male fertility detection** developed by **Dr Priyanka Narad and Dr Abhishek Sengupta of Amity Institute of Biotechnology, Noida** was transferred to **M/s APS Lifetech**

  The AI based software is a machine learning based algorithm for prediction of outcomes in men with Y chromosome microdeletions. It is a user-friendly productive tool that allows clinicians/geneticists/patients to know the outcome of Assisted Reproductive Technology (ART) when there is a Y chromosome (male chromosome) microdeletion.

The software will allow to detect the level of male fertility, more precisely, efficiently and accurately. The licensing of this software to industry is a significant milestone, showcasing the commercial potential of this technology.

4.2 Students of Amity University Bihar had developed a software known as “Parth” in which is a single database to manage online the arbitration as well as mediation processing for which they have won first prize in the "Smart India Hackathon 2022" competition. The Ministry of Education and Innovation Cell, Government of India have assured to extend all possible support for the development and implementation of this technology.

4.3 The transfer of some of technologies have been initiated by signing NDA-MTA Agreement**:**

SNO	TECHNOLOGY	INVENTOR	INDUSTRY
1	Application of superoxide dismutase enzyme towards drug development for the treatment of lung cancer	Dr Nidhee Chaudhary	Premas Biotech Pvt Ltd.
2	Biogenic Carbon Quantum Dot for Directing Chondrogenesis	Dr Monalisa Mukherjee	Himedia Laboratories Pvt. Ltd.

4.4 Some Advanced Technologies Available for Transfer:

- **Mosquito Repellent Paint Additive**

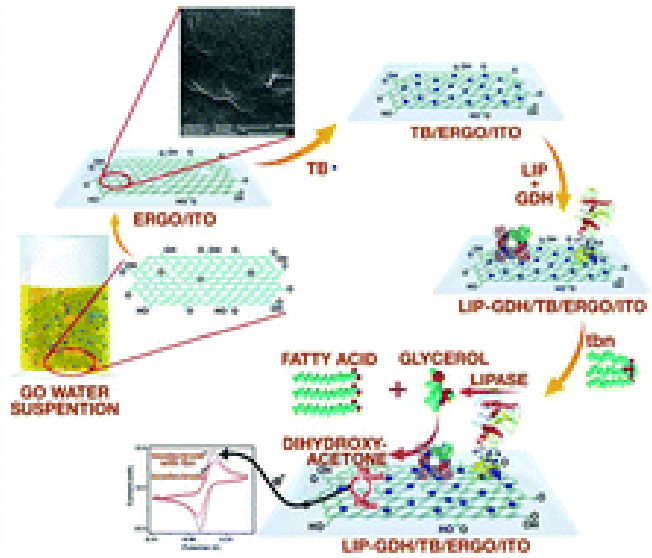
Mosquitoes are pervasive, highlighting the critical need for enhanced protection. Amity Institute of Nanotechnology, Noida has pioneered an innovative, highly efficient mosquito repellent solution. This groundbreaking product is derived from plants and meticulously engineered at the nano level to serve as a paint additive. Extensive testing, both in controlled laboratory environments and real-world scenarios, has demonstrated its remarkable effectiveness for repellence for over two years .

- **Bio-Pesticide Against Rice Blast**

Rice Blast disease, which destroys 10 to 35% of the global rice crop, demands our attention. Rice is extensively cultivated in India, and the rice blast disease tends to appear in areas with high humidity and low temperatures during nights. A potential bio-pesticide for managing Rice Blast Fungus, Magnaporthe oryzae, was identified by Amity Institute of Biotechnology

- **Triglyceride Sensor**

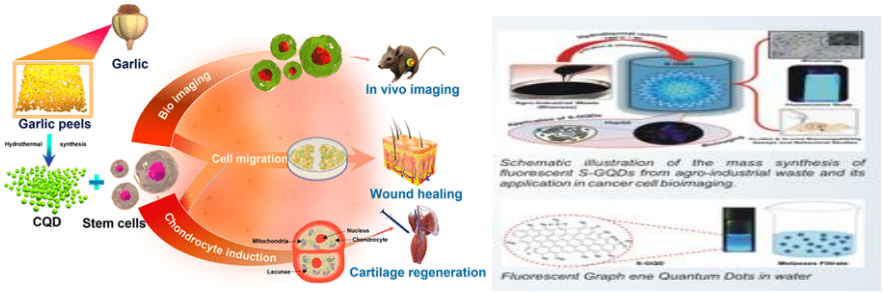
A novel electrochemically reduced grapheneoxide (ERGO) platform was utilized to create a triglyceride (TG) biosensor. The sensor was developed by co-immobilizing lipase (LIP) and glycerol dehydrogenase. This innovative sensor developed by Amity Center for Nanomedicine has the capability to detect tributyrin within the concentration range of 50-400 mgdL^-1, displaying high sensitivity at 29 pA mg^-1dL when tested with human serum samples.



- **Herbal Hair Dye**

The Herbal Hair Dye, developed by the Amity Institute of Phytochemistry and Phytomedicine (AIPP), has received an outstanding response from multiple companies in the Indian market. To offer these organizations a comprehensive understanding of the product's capabilities and shades, live demonstration was conducted on human hair as well. This helped with the improvement in developed product.

- **Novel Biogenic Carbon Quantum Dots**



Amity Institute of Click Chemistry Research & Studies has developed Biogenic Carbon Quantum Dots (BCQDs) which facilitates Stem cell migration, imaging and simultaneously direct chondrogenesis for cartilage formation. These BCQDs are synthesized from biowaste using simple hydrothermal processes, offering cost-effective and eco-friendly production.

- **Biodegradable Edible Film**

The Amity Institute of Phytochemistry and Phytomedicine (AIPP) developed a biodegradable edible film for wrapping fruits to enhance shelf life.

- **Agrivoltaics**

Amity Agri-Photovoltaics Solar Farm Installed on Organic Agricultural Land at Amity University Uttar Pradesh, Noida

The Amity Institute of Advanced Research and Studies (Materials and Devices), Amity University, Noida, has introduced an innovative concept called 'AGRIVOLTAICS' as a measure to double the income of farmers. This approach combines solar energy harvesting above the ground with crop cultivation on the ground to boost income without affecting the crops.

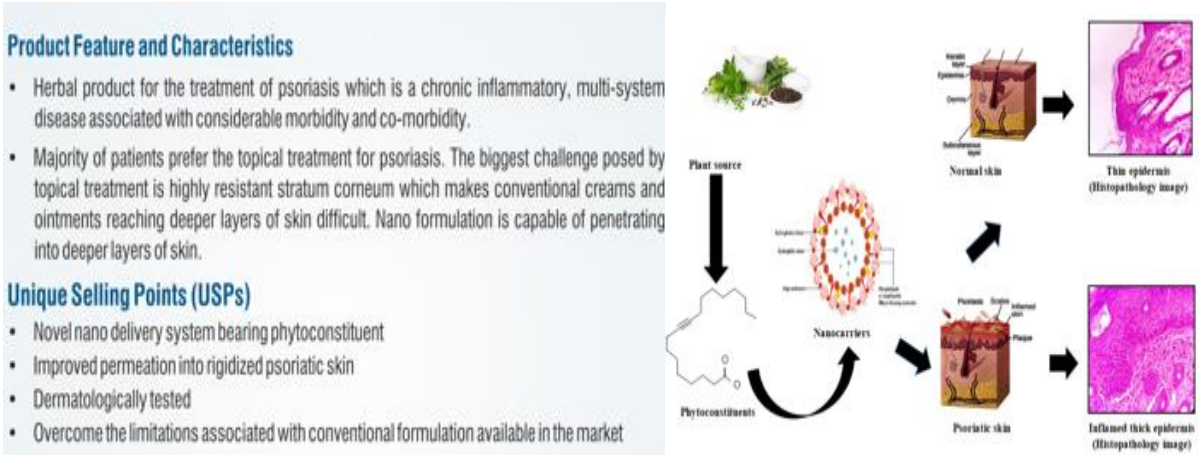
- **Plant Growth Promoting Consortia**

Consortia of Talaromyces purpureogenus HNB9 and Bacillus subtilis promote plant growth and development, provide resistance against biotic stress, and enhance yields in diverse crops. This novel technology harnesses the power of beneficial fungi residing within the roots of plants to enhance nutrient uptake, improve plant growth, and mitigate environmental challenges. The holistic use of the microbial consortia gives value addition to plants including biomass and nutritional content. Simultaneously, they also provide tolerance against biotic and abiotic stresses; show various PGPR (Plant Growth Promoting Rhizospheric microbes) properties like Phosphate, Zinc, Iron and Silica solubilization and auxin production, add to soil fertility.

- **Plant Based Straws**

Due to environmental concerns, a sustainable alternative to plastic straws is essential. AIPP identified a crop in North-West India suitable for making drinking straws from its stems. DST-Amity TEC facilitated meetings between AIPP and two Indian drinking straw manufacturers. The manufacturers evaluated the product, discussed certifications, human trials, and user feedback. The concerned innovator is now preparing fresh samples incorporating all the received feedback.

- **Novel Herbal Remedy for the Management of Psoriasis**



- **Topical antibacterial formulation (in gel form) containing "Dinoxin B withanolide**

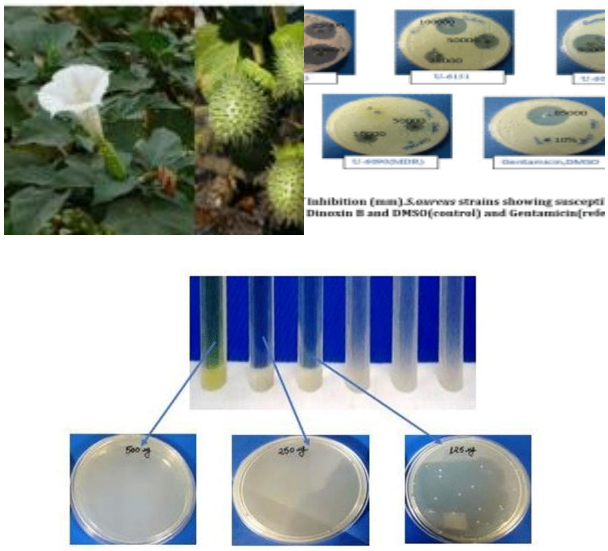


Figure 7: Minimum bactericidal concentration against Methicillin-Resistant *S.aureus* as 25mg/ml.

Dinoxin B with its bactericidal properties and significant affinity towards **Quorum**-signaling Sar A protein and Penicillin Binding Protein works as an effective bioactive compound against Methicillin Resistance *Staphylococcus aureus.*

Chapter – 5 CONSULTANCY PROJECTS & TRAINING PROGRAMMES

5.1 The success of a university is not solely measured by the academic achievements of its students; it also hinges on its ability to engage with the community, industry, and society at large.

5.2 Consultancy and training programs are crucial components that enable universities to extend their expertise beyond the classroom and contribute in capacity building.

5.3 Amity Universities have forged strategic partnerships with various industries, offering consultancy services in areas such as science, engineering, technology, business management, and research and development. Our faculty members have actively engaged in collaborative projects, providing valuable insights and solutions to industry-specific challenges.

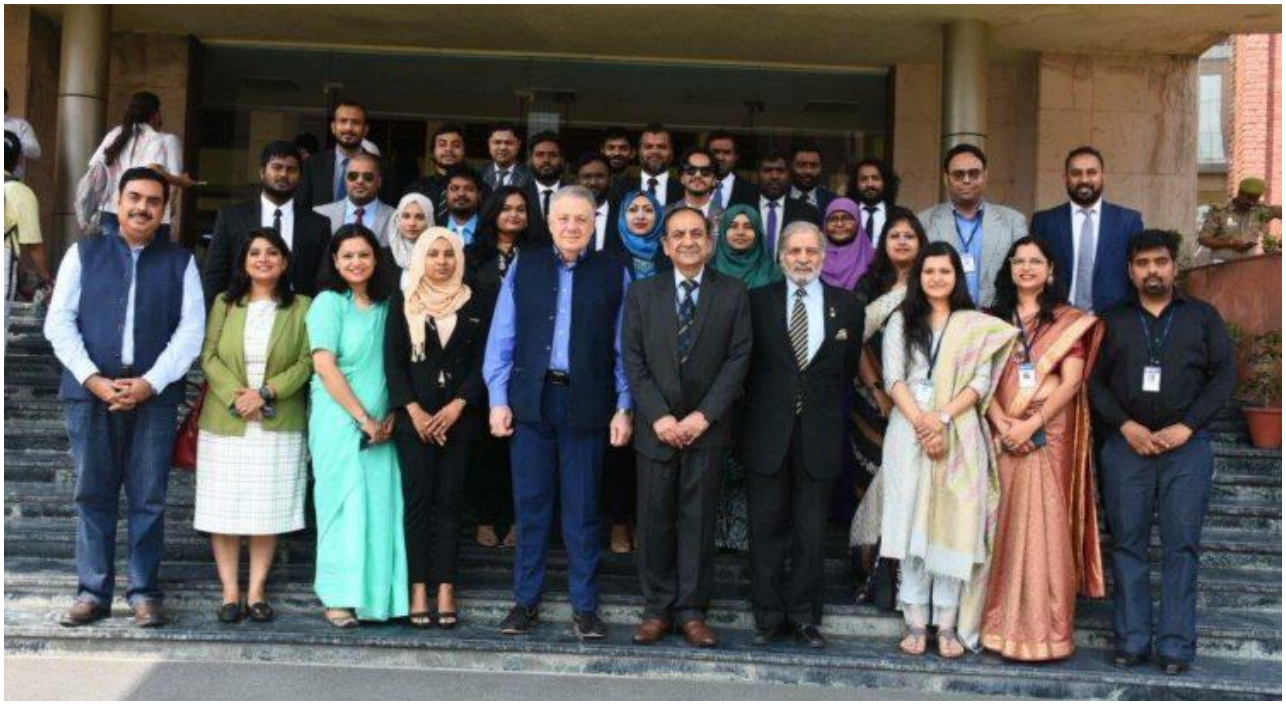
5.4 Amity has undertaken 221 consultancy and training projects generating a revenue of approximately ₹15 crore and 49 lakhs in the year 2023.

5.5 The university has actively participated in government consultancy projects, contributing expertise to policy development, program evaluation, and other areas of national importance. Consultancy has been successfully provided to **Britannia Industries, Ruchi Hi Rich Seeds Pvt Ltd, Paritosh Shekhar, Global Council for Science and the Enviroment, Embassy of USA (SAFE WATER NETWORK INDIA), Sodhani Biotech Pvt Ltd, CCFT Laboratories Pvt Ltd, Agri Land Biotech Ltd, Innoscience Research (a Malaysia based company), Load Infotech, National Monuments Authority (Ministry of Culture, Government of India) , Gubbi Civil Engineers Ltd, Wenzins Technologie (India) Pvt Ltd.**

5.6 The university has conducted a series of training programmes aimed at enhancing the professional skills of individuals in various fields. Workshops and seminars on leadership, communication, project management, and emerging

technologies have been organized to cater to the diverse needs of participants. Training programmes have been conducted in collaboration with **GAIL, Ministry of External Affairs, Kotak Mahindra, National Institute of Social Defence, Ministry of Social Justice and Empowerment, Punjab & Sind Bank, Defence Research & Development Organisation, Anthropological survey of India, Department of Science & Technology, Kailash Satyarthi Children's Foundation, West Bengal State Livelihood Mission, Mercedes-Benz India Private Limited, Reserve Bank of India , Indian Oil Corporation Ltd, Tata Motors Ltd., NTPC, Bharat Electronics Ltd., Coforge Ltd, Zydus life sciences limited, HDFC bank ltd., BSF, AU small finance bank Ltd.**

Five-day hands-on-Training Programme on Tools and Techniques of Water Quality Monitoring, Sampling, Analysis, and Quality Assurance



UNIVERSITY NEWS

Amity University Conducts "In-Service Training of Editors And Journalists Of Maldives" Programme, Sponsored By Ministry Of External Affairs, Govt. Of India

India Immersion Programme 2023

5.7 These consultancy and training programmes underscore the university's commitment to knowledge dissemination beyond its campus boundaries. Through these initiatives, the university not only enriches its academic environment but also actively contributes to societal development and industry advancement. The continuous growth and positive impact of these programmes reflect the dedication of our faculty, students, and partners in fostering a culture of learning and collaboration.

5.8 **Department of Science & Technology - Synergistic Training program Utilizing the Scientific and Technological Infrastructure (DST-STUTI) Programme**

Amity University worked as Hub with 10+ partner institutions for conducting 22 training programmes.

KEY INSIGHTS:

1. Mentoring & Navigation by Senior Management of Amity PMU Team.
2. Guidance on Technical and Scientific Aspects by Scientific Administration.
3. Dedicated & Experienced Team for the successful conduct of the Program.
4. Seamless Registration Process.
5. Seamless Finance Management.
6. Good Practices adopted during execution of STUTI by Amity PMU.
7. Significant parameters adopted.

SCHOOL AWARENESS PROGRAM

835	23	16	4
Students	Schools	Training	States

Amity Institute of Nuclear Science & Technology (AINST), Amity University Uttar Pradesh, Noida organized a Four-day, Advanced Workshop on "The Applications of Nuclear Security: Detection Equipment and Methodologies" under the patronage of Texas A&M University (TAMU), Oak Ridge National Laboratory (ORNL) and Defense Threat Reduction Agency (DTRA), US, from 19th to 22nd June 2023.

Provided hands on training on various radiation detection systems and demonstrated their importance to the participants for nuclear security. 25 Participants (scientists and research scholars) from organizations such as NDRF, UPES Dehradun, IITs, Mody University, Rajasthan and many other institutions participated in the workshop.

Chapter - 6 AWARDS & FELLOWSHIPS

6.1 The development and advancement of faculty and students along with their accomplishments is minored in the form of Awards and fellowships. The awards & fellowships also indicate which provide self-confidence and intrinsic motivation. In addition to being helpful for their professional advancement, they also serve as a reflection of external validation and recognition of their accomplishments.

6.2 Amity, therefore, encourages its faculty/researchers and students to participate and compete at National & International forums for research and Innovation as well as Academics for prestigious awards, fellowships, scholarships.

6.3 In recognition of excellence and outstanding accomplishment in research and Academics, the brilliant and dynamic faculty members of Amity Education Group have been bestowed with more than 139 awards, 60 fellowships/ travel grants and 100+ recognitions in the year 2023.

6.4 Amity University received "Prestigious Academia Award" during "India Defence Conclave" organised by The Economic Times in association with DRDO, Ministry of Defense, Government of India on May 26, 2023.

Dr. Ashok K Chauhan receiving the award from Dr. Jitendra Singh, Minister of State (Independent Charge) for the Ministry of Science & Technology

6.5 Some of the awards received includes: -

Dr. Atul Chuhan, Chancellor, Amity University Uttar Pradesh & Dr. Balvinder Shukla, Vice- Chancellor, Amity University Uttar Pradesh receiving the award for No.1 Rank as Private Multidisciplinary University

Dr. Balvinder Shukla, Vice- Chancellor, Amity University Uttar Pradesh receiving the Best University for Environment Studies Award 2023 at 11th Global Safety Summit!

- The Life-Time Achievement Award was conferred upon Prof. Dr Balvinder Shukla, Vice Chancellor Amity University by College Duniya for the year 2023.

- Prof. (Dr.) Amit Jain, Vice- Chancellor, Amity University Rajasthan was bestowed with Faculty Leadership Excellence Award (amongst the Youngest Vice Chancellors in the Country) Education Summit 2023
- Dr. Vivekanand Pandey, Vice- Chancellor Amity University Patna was bestowed with Award of Excellent and Innovative Leader, Prayas Social and Educational Development Trust
- Prof. Vinay Sharma,Director - Amity Institute of Biotechnology, Amity University Rajasthan received Prof. BM Johri Memorial Award 2022.
- Prof. Dr. P.C.S. Devara, Director of the Amity Centre of Oceanic-atmospheric Science and Technology (Amity COAST) at Amity University Haryana received the prestigious "KALAM RESEARCH AWARD"
- Prof. (Dr.) R.S. Tomar, Professor & Head, Dean (Life Sciences) & Dean (Academics), Amity University Madhya Pradesh received Dr. Sarvepalli Radhakrishnan Academic Leadership Award 2023
- Dr. Luxita Sharma, Associate Professor and Head, Dietetics and Applied Nutrition Amity University Haryana received the Hindustan Icon Award for her

Significant Contribution in the field of Dietetics & Applied Nutrition on the Occasion Of AGRI-TECH WORLD 2023.

- Mr. Sandeep Kumar Yoga from Amity Institute of Indian System of Medicine (AIISM) received Dr. Ambedkar International Social Honourable Award 2022-23 by Human Health Development Society of Patna (Bihar) in 2023.

Dr. Ajay Sharma from Amity Institute of Biotechnology, Noida was awarded Careers360 Faculty Research Awards 2023

Ms. Suhani Chauhan, student at Amity International School, Pushp Vihar receiving the prestigious Pradhan Mantri Rashtriya Bal Puruskar Award in the Innovation category

6.6 The faculty and students have also received prestigious fellowships and travel grants from Royal Society of London, SERB-SIRE, SERB – TARE, Indian Society of Agriculture Biochemists, HORIZON European Commission, INSA Visiting Scientist, European Molecular Biology Organization, Erasmus+ International staff

training Mobility Program, Eudoxia Research University USA, (DESIS FinSpire Fellowship, United Nations Millennium Fellow for the Class of 2023, Smart India Hackathon. Some of these are shared below: -

- Dr. Chanderdeep Tandon, Dean- Faculty of Sciences, Amity University Punjab elected as a Fellow of the Royal Society of Biology (FRSB).
- Dr. Pooja Vijayaraghavan, Officiating Head, Amity Institute of Biotechnology, Amity University Noida elected as the Fellow of the Royal Society of Biology (FRSB).
- Dr. Biswajit Saha, Alexander von Humboldt Fellow (Germany) & Professor, Amity Institute of Biotechnology, Amity University Noida was honored with the prestigious Fellow of The Royal Society of Chemistry.

United States-India Educational Foundation (USIEF)

Dr. Ranu Nayak, Professor, Amity Institute of Nanotechnology, Amity University Uttar Pradesh awarded with the Short Research Trip to France (SRTF) grant generously awarded by The French Institute in India

6.7 The faculty of Amity has been recognised at various National & International research forums.

Amity University was shortlisted to the display of Technologies for the expo at Pragati Maidan, Delhi organized during the occasion of National Technology week inaugurated by Hon'ble Prime Minister Shri Narendra Modi

Amity University Showcases its Path-Breaking Innovations During Indian Space Conclave-2023

Amity University Participates in "Vishwavidyalaya Anusandhan Utsav-2023"

- **4 women faculty members** have been featured in **She Is - Women in Chemistry** by **The Royal Society of Chemistry, The Office of the Principal Scientific Advisor, Government of India and Safecity.**

Prof. (Dr.) Nutan Kaushik
Director General
Amity Food and Agriculture Foundation, Amity University, Noida

Prof (Dr.) Monalisa Mukherjee
Director, Amity Institute of Click Chemistry Research and Studies, Amity University, Noida

Dr. Jaya Pandey
Head, Department of Chemistry
Amity University, Uttar Pradesh, Lucknow Campus

Dr. *Dipti Vaya*
Associate Professor, Amity School of Applied Sciences, Amity University, Haryana

- **Thirty-Four** Amity University faculty members figure in **top 2%** of Global Researchers from India, in the list compiled by Stanford University, USA 2024.

6.8 University-wise summary of the Awards, fellowships and recognition received by Amity faculty are as follows: -

Name of the Campus	Award	Fellowship	Recognition
Amity University Uttar Pradesh Noida	77	11	31
Amity University Uttar Pradesh Lucknow	15	5	32
Amity University Uttar Pradesh Greater Noida	5	0	1
Amity University Madhya Pradesh	12	9	2
Amity University West Bengal	0	6	6
Amity University Haryana	13	5	20
Amity University Rajasthan	4	0	11
Amity University Mumbai	1	10	1
Amity University Chhattisgarh	1	4	0
Amity University Bihar	8	0	0
Amity University Jharkhand	0	1	2
Amity University Punjab	3	9	5
TOTAL	**139**	**60**	**111**

6.9 RAMALINGASWAMI, RAMANUJAN & DST-INSPIRE FELLOWS 2023

Several researchers who have been awarded prestigious fellowships such as Ramalingaswami re-entry fellowship, Ramanujan fellowship, DST-INSPIRE etc have been associated with amity in the past few years. The total number of such fellows working in Amity university campuses is as mentioned below:-

Type of Fellowship	Total
Ramalingaswami Fellow	**17**
DST Inspire Faculty Fellow	**7**
Ramanujan Fellow	**5**
SERB SRS Fellow	**1**
DBT Wellcome Trust Fellow	**1**
Women Scientist (ICMR, DST)	**2**
Total	**33**

Out of the above mentioned, 22 fellows are Active while the remaining 11 Fellows have completed their tenure and have been absorbed in various faculty positions within Amity.

Dr Saikat Dutta
Functional Materials, Therapeutic Materials, Energy storage

Dr. Adhiraj Roy
Molecular oncology, Signal transduction, Protein kinases

Dr. Veerendra Kumar
Single Particle Cryo-EM, X-ray Crystallography, Protein expression, purification

Dr. Ramesh Thimmappa
Triterpenes, Biosynthetic Pathways, Structural Bioinformatics and Structural Biology, Chemical Biology

Dr. Subrata Pore
Chemical Biology, Medicinal Chemistry, Cancer Biology, Neurourology

Dr Raja Bhattacharya
Neuromodulation Neurotransmission

Dr. Amit Ranjan Maity
Nanomedicine, Biomaterials, Drug Delivery

Dr. Ankan Dutta Chowdhury
Applied Chemistry, Biosensor, Nanomaterials

Dr. Abhishek Guldhe
Biofuels, Algal Biotechnology, Enzyme catalysis, Biodiesel

Dr. Manoranjan Nayak
Biotechnology, Microalgal Biorefinery for Biodiesel & Biorenewables

Dr. Jayasha Shandilya
Gene Regulation, Cell Cycle, Epigenetics, Cancer

Dr. Arnab Basu
Biochemistry, Molecular Biology, Microbiology

Dr. Kayambu Namitharan
Organic Chemistry

Dr. Anwesha Bhattacharyya
Neurobiology

Dr. Shinjinee Dasgupta
Amyloid Biology and Cancer Research

Dr. Ashish Srivastava
Virology

Dr. Milan Bera
Organic Chemistry

Dr. Sneha Gokani
Space Science

Dr. Suman Majumdar
Statistical Mechanics, Polymer Active Matter Computer Simulation

Dr. Kirti Saxena
Nanotechnology, Biosensors

Dr. Shaheen Hussain
Bio nanotechnology, Tissue engineering, Nanomedicine

Dr. Arif Sheikh
Nanotechnology

Chapter - 7 COLLABORATION

7.1 MEMORANDUM OF UNDERSTANDING (MOUs)

- Collaborations through Memoranda of Understanding (MoUs) are of paramount importance for universities, providing a range of benefits that contribute to their academic, research, and institutional development. MoU's play a vital role in bridging the gap between Industries, Academic & Government agencies for increasing the academic and research capabilities of both organizations.

- Amity University promotes and supports cooperation between domestic and foreign organizations that focus on research. The scope of all such collaborative endeavours includes joint research projects, joint publications, IPR creation, product/technology development, joint Ph.D.s, student exchanges, dissertations, and projects, honorary or adjunct professorships, faculty visits abroad, international conferences, seminars, and workshops, among other things fostering a culture of lifelong learning within the university community.

- Amity has signed 140 MoUs i.e; 111 National and 29 International in 2023.

- The University wise summary of MoUs initiated are given below: -

S.No	Initiated by	No. of National MoUs	No. of International MoUs
1	Amity University Uttar Pradesh (Noida, Lucknow & Greater Noida)	67	20
3	Amity University Haryana	8	2
5	Amity University Rajasthan	2	3
6	Amity University West Bengal	2	0
7	Amity University Madhya Pradesh	4	0
8	Amity University Maharashtra	4	1
9	Amity University Bihar	13	2
10	Amity University Jharkhand	5	0
11	Amity University Chhattisgarh	5	1
12	Amity University Punjab	1	0
Total		**111**	**29**

- Some of the International MoUs include **College De Paris - France, Kyushu Institute of Technology (KYUTECH)- Japan, Massey University - New Zealand, Said Business School, University of Oxford - United Kingdom, SRH Berlin University of Applied Sciences - Germany, Management & Science University (MSU)- Malaysia, The United Nations Children's Fund- Programme Co-operation Agreement Jal Jeevn Mission - - USA, Minin University - Russia, ELTAI chapter for Indian English Teachers Teaching Abroad- Sultanate of Oman, University of Buenos Aires, Argentina, Sekisho Corporation Japan**

Mr Mesaki Seki, President, Sekisho Corporation & Dr. Atul Chauhan, Chancellor, Amity University

Mr. Kenneth T. Christensen, Provost and Senior Vice President for Academic Affairs and Mr. Nate Downing, Relationship Manager & Dr. Gurinder Singh, Group Vice Chancellor, Amity Universities

Delegation from Argentina with Dr. Gurinder Singh, Group Vice Chancellor, Amity Universities

- Some of the National MoUs include Indian **Council of Medical Research (ICMR),Solid State Physics Laboratory (SSPL - DRDO), Terminal Ballistics Research Laboratory (TBRL-DRDO), Indian Fertility Society, DRDO-Defence Institute of High-Altitude Research (DIHAR), Rajiv Gandhi Super Speciality Hospital, Fortis Hospital, Telangana University, Bisleri International Pvt. Ltd., Central Institute of Petrochemicals Engineering & Technology (CIEPT)**

Dr. Meena Mishra, Director, Solid State Physics Lab (SSPL), DRDO & Dr. W. Selvamurthy, President, ASTIF during the signing of MoU

Prof. Prateek Kishore, Distinguished Scientist & Director, Terminal Ballistics Research Laboratory (TBRL), Chandigarh, accompanied by three Scientists, Dr P K Soni, Dr Pal Dinesh Kumar and Dr Inder Pal Sandhu, visited Amity University, Noida. On this occasion, Amity University Uttar Pradesh Noida campus signed an MoU with Terminal Ballistics Research Laboratory (TBRL), Chandigarh

- A brief of the outcome of some of the MoUs are shared below: -

NATIONAL

i) Indian Council of Agriculture Research (ICAR)

- ✓ 36 research scholars from ICAR have joined Amity University for Ph.D jointly guided.
- ✓ ICAR has sanctioned 6 research projects to Amity University
- ✓ ICAR scientists and Amity researchers have jointly published 352 research papers in science journals.
- ✓ A total of 4 Joint Patents have been filed.
- ✓ Amity University Chhattisgarh has signed an MoU with National Institute of Biotic Stress management-ICAR, Raipur in June 2020 for PG student training and Research.
- ✓ ICAR Scientists are part of DRC at Amity for Ph. D Evaluation

- ✓ 22 external Co-guides from ICAR guiding Amity Ph.D. scholars,
- ✓ Amity scientists have been participating and delivering lectures /keynote address at various conferences, workshops, symposiums organized at ICAR labs like Dr. Vanita Chandel Assistant Professor, Amity Institute of Virology and Immunology invited as Expert in Brainstorming Session on Prospectus of dsRNA based Biopesticides for Crop Protection at Indian Agriculture Convenorship of Dr. Bikash Mandal, ADG (IR), ICAR and FNAAS on September 26, 2023.
- ✓ ICAR Scientists are a part of Amity workshops, conferences etc.

ii) Council of Scientific and Industrial Research (CSIR)

- ✓ 370 Joint Scientific Publications emerged between Amity & CSIR scientists
- ✓ In Year 2023, Amity and CSIR labs have published total 87 Joint Publications
- ✓ 6 Collaborative Research Projects funded by DBT, SERB, ICMR, CSIR worth Rs 320+ lakhs are presently ongoing.
- ✓ 7 other projects worth Rs140 lakhs sanctioned by CSIR which are ongoing.
- ✓ 3 joint patents have been filed.
- ✓ 33 doctoral candidates are currently pursuing their Ph.D. studies, Co-guided by scientists from various CSIR labs.
- ✓ 23 Amity Students have completed their Internship and Dissertation at different CSIR Labs
- ✓ CSIR supporting DST STUTI:144 applicants from various CSIR Labs registered for attending the STUTI training programs at various locations.
- ✓ CSIR has provided 5 lakhs funding for conducting workshops at Amity
- ✓ Almost 40% Participants in DST sponsored Capacity Building Training Program for S&T personals were from various CSIR Labs.
- ✓ 07 Participants from CSIR-IGIB, NISCPR, CSIR-HRDC attended the Two days Science Communication workshop held at Amity University Noida on 27th -28th July 2023, which was sponsored by DBT Wellcome Trust.

- ✓ The 2nd Steering Committee meeting was held in January 2023 with DG-CSIR (Dr. N Kalaiselvi) in the chair.
- ✓ DG- CSIR visited Amity University Noida on 28th July 2023 and delivered the ASTIF oration on 'Energy Management: Indian Perspective'
- ✓ Dr. Meenakshi Singh, along with the few scientists from NPL, IGIB met in person and other steering committee members from CSIR and Amity Group joined the "Progress Review Meeting" held on 10/08/2023 at Amity University.
- ✓ Dr. N Kalaiselvi was a member of Advisory Board in the mega S-20 event held on 4-5 September 2023. Dr. Vibha Malhotra, Head IPU-CSIR was the invited guest speaker.
- ✓ A brainstorming meeting on 23rd November 2023 with CSIO was conducted to discuss and explore the various joint opportunities under Jal Jeevan Mission for Water Purification Management.
- ✓ Dr. Ishita Matai, Assistant Professor, ASBS-AUPb participated as a panel member in One Week One Lab event organized by CSIO.

iii) Indian Council of Medical Research (ICMR)

- ✓ 22 research scholars from ICMR have joined Amity University for Ph.D.
- ✓ ICMR has sanctioned 49 research projects to Amity University
- ✓ ICMR scientists and Amity researchers have jointly published 274 research papers
- ✓ 29 SRFs, 17 JRFs, and 1 young scientist were sanctioned by ICMR who have since joined Amity Institutes
- ✓ Dr. Ashok K. Chauhan, Founder President of Amity Group of Institutions was the Chief Guest on 5th Rajasthan Conclave of ICMR which was held in December 2017, at the Desert Medicine Research Centre (DMRC) Jodhpur. Amity had also participated very actively in the 3rd ,4th and 5th Rajasthan Conclave' organized by DMRC.
- ✓ Dr. VM Katoch, then Secretary, Department of Health Research and DG, ICMR and Dr. Soumya Swaminathan, then DG, ICMR were bestowed with D.Sc Honoris Causa in 2013 and 2015 respectively.
- ✓ ICMR scientists have been participating and delivering lectures /keynotes.

- ✓ Dr. V.M. Katoch, DG, ICMR gave a talk on "New Technological Challenges in Medical Research".
- ✓ Dr. Azad S. Kundu, Deputy Director General & Chief of Social & Behavioural Research, ICMR delivered a talk on "Conceptualization of Research in Mental Health, Obstacles, and Solutions" on orientation programme for the benefit of MPhil (Clinical Psychology).
- ✓ Dr. V.K. Shirivastava, Scientist 'G', Head (P&I), ICMR shared various facets of the functioning of ICMR at Amity University Haryana.
- ✓ Dr. Himanshu Kumar Chaturvedi, Scientist F, ICMR participated in "Methodology in Biosocial Research" workshop at Amity Noida.
- ✓ Dr. K.K. Ganguly, Scientist, ICMR participated in a workshop on "Applied Anthropology: Paradigm Shift and Challenges"
- ✓ Dr. Sadhna Srivastava, Scientist 'E' participated in a conference as a resource speaker at the "National Conference on IPR in BioSciences" for scientists from North-East Indian States.
- ✓ Dr. Ashok. K. Chauhan, Founder President, and Dr. W Selvamurthy with a few other scientists have joined the workshop held in November 2017 at ICMR-National Institute of Cancer Prevention and Research (NICPR).
- ✓ 5 external Co-guides from ICMR guiding Amity Ph.D. scholars,
- ✓ PG students from various Institutes of Amity University carried out their research work through Internships at the Institute/Centers of ICMR and shared the laboratories and other facilities of ICMR.
- ✓ Dr. W Selvamurthy is serving as the Chairman of the Committee on Technology Commercialization in ICMR which has successfully transferred several technologies to Indian industries for commercialization. Also, he is the Chairman of TAC for the MDMS scheme for Biomedical Technology Development at the national level.

iv) Institute of Pesticide Formulation Technology (IPFT), Gurgaon

- ✓ Project concept was submitted "Development and validation of Organic Farming Agriculture Production system in Uttarakhand".
- ✓ Staff enrolled for Ph.D. at AUUP Noida.
- ✓ Expert from IPFT as guest speaker in Amity training program.

v) The Institute of Liver and Biliary Sciences, New Delhi

- ✓ 2 Joint publications
- ✓ Lecture was delivered by Dr Trehan under the Aegis of webinars and lecture series
- ✓ One PhD scholar completed her PhD from Amity

vi) Rajiv Gandhi Cancer Institute & Research Centre, New Delhi

- ✓ Three research grants received from ICMR, in which Co-PI are from RGCIRC
- ✓ Three Students enrolled from RGCIRC for Ph.D at AIMMSCR
- ✓ Dr. Rajeev Kumar, Oncologist & Director, Breast Surgery, (RGCIRC) is co-guide of one of the Ph.D Scholar
- ✓ Three Publications published together with RGCIRC.

vii) Indian Fertility Society, New Delhi

- ✓ One Year Diploma Program jointly organized by AUUP Noida and Indian Fertility Society (IFS) for MBBS, MD in Gynaecology in Clinical Embryology and Clinical Assisted Reproductive Technology:
- ✓ 31 students of Clinical Embryology (DCE) and 66 students of Diploma in Clinical ART (DCR) were trained.
- ✓ 100% of students placed either at their same IFS affiliated enter where they completed their diploma or at some other reputed IVF Clinic and/or Fertility Hospital across the country. Some students went on to open their own IVF clinics.
- ✓ Part-time PhD student at AIMMSCR since July 2021.

viii) Morarji Desai National Institute of Yoga

- ✓ 1 month duration Foundation Course in Yoga Science for Wellness (FCYScW)
- ✓ 3 months duration Certificate Course in Yoga for Protocol Instructor (CCYPI)
- ✓ In Mar 2020, Amity Institute of Indian System of Medicine (AIISM) with Morarji Desai National Institute of Yoga, Government of India successfully organized a One-month Certificate Course in Yoga for Protocol Instructor for Participants of Leh-Ladakh.

- ✓ On 09 Jun 2022 AIISM conducted an Half Day Yoga Workshop on the theme "Yoga for Positive Health and Happy Life" on the occasion of International Day of Yoga (IDY-2022) in celebration of 100 days countdown to IDY 2022 in association with Morarji Desai National Institute of Yoga, Ministry of Ayush, GoI at Amity University Noida Campus

ix) CENTRAL COUNCIL FOR RESEARCH IN UNANI MEDICINE (CCRUM)

- ✓ 3 Research Project was granted by CCRUM
- ✓ DST Training Programs held in Feb 2022 and Sep 2022, Prof. (Dr.) Asim Ali Khan, Director General-CCRUM was invited as Resource Person and Prof. Khan conducted both the sessions on "Integrating traditional and modern medicine for Affordable health Unani Perspective" very effectively.
- ✓ Prof. (Dr.) Asim Ali Khan, Director General-CCRUM completed his Ph.D from Amity

x) All India Institute of Ayurveda (AIIA)

- ✓ Joint projects submission has been initiated
- ✓ AIIA experts as External Member of the DRC Committee
- ✓ AIIA organized the Food Expo 2021 on the auspicious occasion of Ayurveda Day on October 30, 2021. At this exhibition, one of the stalls featured innovations developed by Amity.
- ✓ Amity to be a part of Ayurvedic drug Network for which discussions are in process.

INTERNATIONAL

i) The University of Adelaide

- ✓ Visit of UoA delegation to AUUP on 29th March 2023.
- ✓ Detailed discussions regarding mapping with representatives from Center for biotechnology and biochemical engineering AIB coordinated by Dr Seema Bhatnagar.
- ✓ Approval for credit transfer received.

- ✓ Meeting with UoA representatives regarding promotional material with Dr Seema Bhatnagar and Dr Rajashree Das.
- ✓ Request for approval sent to Dean Academics AUUP on 24-08 2023.

ii) University of Szeged, Hungary

- ✓ 10 students have been sent to Hungary
- ✓ 25 joint publications
- ✓ 6 Number of Seminar/Conference/Symposia Jointly held
- ✓ Dr. Seema Garg has got a joint project with University of Szeged in Oct'2016
- ✓ Dr. Seema Garg visited Hungary in 2017,2018, 2019 and a team from Hungary also visited Amity 2017,2018, 2019.
- ✓ Dr. Seema Garg also received certificate of Appreciation as exemplary collaboration from the University of Szeged.
- ✓ Prof. Klara Hernadi, received Honorary Professorship from AUUP.
- ✓ 3 Joint Guideship under the Supervision of Dr. Seema Garg and Prof Kalra.
- ✓ Dr. Mohit Yadav has joined Unversity of Szeged as a post Doc in 2020.
- ✓ Ms. Nishat khan got full fellowship from University of Szeged for 4 months for major project from 22nd feb 2023.
- ✓ Dr. Harshita Chawla got offer letter for Post Doc from University of Szeged

iii) Monash University, Australia

- ✓ Articulation completed.
- ✓ Request for launch of 2+2 International programmes and generation of programme codes sent to Registrar office, AUUP on 22nd March 2023 by Amity Institute of Biotechnology."

iv) Roehampton University, UK

- ✓ Launch of MSc Intl, 1+2 and 2+2 articulation for B.Sc Programmes and generation of programme codes sent to Registrar office AUUP on 22nd March 2023.
- ✓ Interactive session with faculty of Roehampton University -organised on 12th March 2021
- ✓ Interactive session with faculty of Roehampton University -organised on

22nd November 2021

- ✓ Student has applied under MOU for 2+1 for September 22 Intake
- ✓ 1 Student has applied under MOU for 2+1 for September 23 Intake
- ✓ Guest Lecture by Dr Robert Manderson on 9th March 2022, on Higher Education, Business Quiz and Live project
- ✓ No. of Students/ Teachers involved/ participated
  - 115 students/ 1 faculty coordinator
  - 78 students/ 1 Faculty coordinator
  - 1 student Akanksha Gaur/ 1 Faculty
  - 1 Student- Pritika Verma/ 1 Faculty
  - 156 students/ 2 Faculty Coordinators

v) Aberystwyth University, UK

- ✓ One Student from AIBS had gone to pursue her MBA in September 2022 under Progression model. Guiding UG Students who are keen to do Masters / MBA from UK.
- ✓ Encouraging Short Term Student Mobility under India Immersion Program

vi) LENTIZ Educational Group, Netherlands

- ✓ Dr. Nutan Kaushik and team have designed Courses in collaboration with LENTIZ.
- ✓ Organized joint event in February 2020
- ✓ A Training was Organized by Lentiz
- ✓ A Joint Proposal has been Submitted

vii) KERNEL International Ltd., Bangladesh

- ✓ Dr. Nutan Kaushik has received a project from Asia Pacific Network, Japan on APN CAPABLE with a Funding of INR 37 Lakhs. Using Climate Smart Agriculture Strategies" in which Kernel is an Industry Partner.
- ✓ A training workshop under this project was organized in February 2020 where three scientists from Kernel participated.
- ✓ Kernel organized a Farmers training program in August 2020 under this project.

- ✓ A Joint Proposal was Submitted on Food Safety.
- ✓ A Proposal has also been Received by Amity University, Noida to Set-Up a University in Bangladesh.

viii) Nottingham University, UK

- ✓ 1+1 1dual award Masters (M.Sc) programme at AIB signed with Center for Plant and environmental Biotechnology.
- ✓ Request for launch of MSc Intl, 1+2 and 2+2 articulation for B.Sc Programmes and generation of programme codes sent to Registrar office AUUP on 22nd March 2023.

ix) **Universiti Malaysia Perlis**

- ✓ Keynote Speaker in the 10th ICRITO Conference held in Oct 22
- ✓ Technical Partner in ICRITO Conference held in Oct 22
- ✓ Expert Lecture on "Automated Screening System for Medical Slide Images" by Prof. Dr. Mohd Yusoff Mashor, Deputy Vice Chancellor, UniMAP
- ✓ Expert Lecture on "Identify Computer users Based on Their Way of Typing on the keyboard" by Dr. Syed Zulkarnain Bin Syed Idrus, Associate Professor, UniIMAP
- ✓ Conducted Expert Lectures with UniMAP

x) **Institute of Technology Petronas SDN BHD, Malaysia**

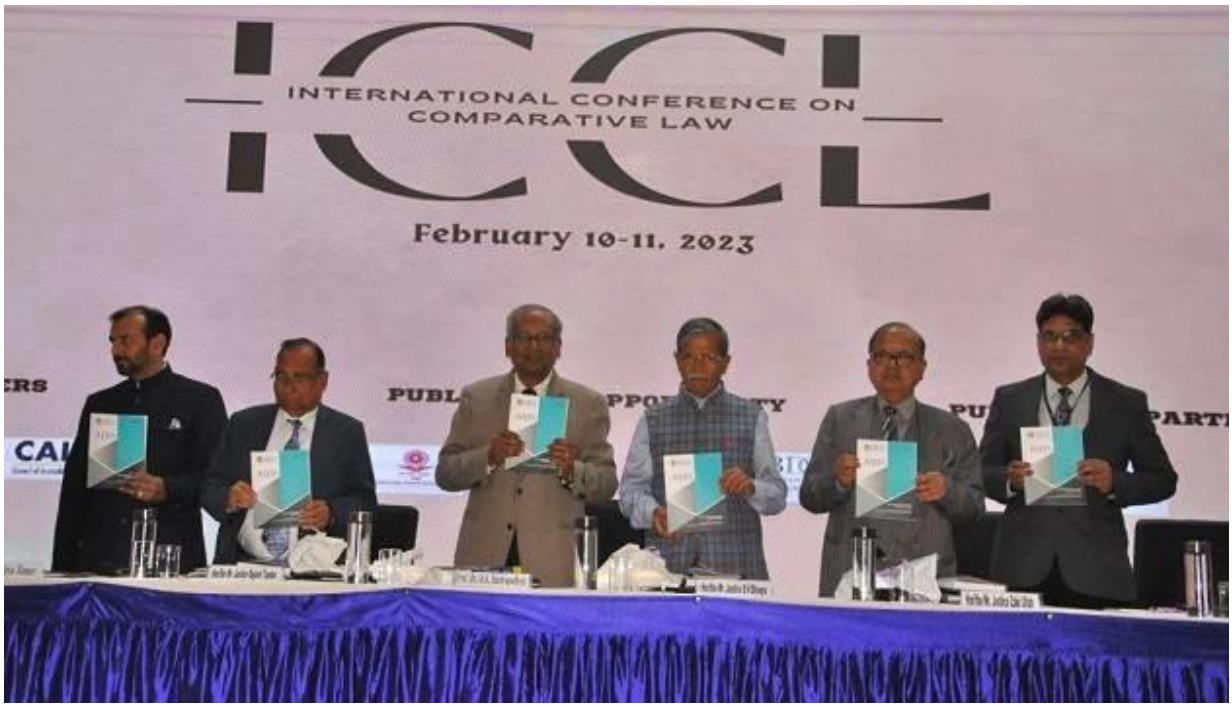
- ✓ Discussion for sending some students on 2+2 B.Tech Petroleum Engineering program (UTP-Amity) Btech
- ✓ Speakers have joined from UTP on 16th Oct 2020 for webinar:
- ✓ Prof. (Dr.) Mohamed Ibrahim Abdul Mutalib, Universiti Teknologi Petronas (UTP), Malaysia gave a talk on 11th International Conference–CONFLUENCE' 2021 themed on "Cloud Computing, Data Science & Engineering" 28-29th Jan, 2021
- ✓ Amity university Kolkata has formulated a research project to be submitted in collaboration with UTP on Resilience Building
- ✓ Dr. W Selvamurthy was invited to the Conference for delivering expert lecture in 2022.

6.2 CONFERENCE/WEBINARS/ VISITS

- Amity among various other initiatives for facilitation of cross fertilization of ideas and thoughts, regularly organizes visits/ lectures for igniting the research acumen of its brilliant and dynamic faculty members/ researchers.
- The group has organized more than 1000 webinars/ Lectures of global relevance during the year for keeping its faculty members and researchers updated with recent technological advancement in their field of research.
- In addition to this, 200+ Conferences, Seminars, workshops and FDPs were organised in 2023.

Dr. Jitendra Singh, the Hon'ble Minister of State (Independent Charge) Ministry of Science & Technology, Minister of State for Prime Minister's Office, Ministry of Personnel, Public Grievances and Pensions, & Department of Atomic Energy & Department of Space, was the Chief Guest of Science20 (S20) Conference under the aegis of G20 addressed the gathering.

Amity Law School, Amity University Uttar Pradesh Noida Organized a Two-Day Inter University Debate Competition, Verbum Bellum 3.0, on the Theme "Celebrating India's Presidency of G-20" Chief Guest, Hon'ble Shri Yogendra Upadhyay, Minister of Higher Education, Uttar Pradesh with Founder President Dr. Ashok K Chauhan



Amity Organises Annual International Conference on "Comparative Law" in collaboration with School of Business and Law, Edith Cowan University, Western Australia

Dr. Aseem Chauhan, Addl President RBEF addressing the gathering "Investor Pitch Day" for Start-ups organised by Amity Innovation Incubator

Amity University Haryana Organises G-20 Lecture by Dr V.K. Saraswat, Member of NITI Aayog and Chancellor of Jawaharlal Nehru University on 'Science and Technology for Sustainable Development

Prof. Soumitra Dutta, Dean, Said Business School, Oxford University UK, receiving an honorary doctorate from Dr. Aseem Chauhan, Chancellor, Amity University & Dr. Gurinder Singh, Group Vice Chancellor, Amity Universities during INBUSH ERA 2023

Amity University organizes an International Conference titled "Pharmaceutical Technology, Phytopharmaceuticals and Biologicals: Trends 2023

7.3 HONORARY DOCTORATES/PROFESSORS

- In the pursuit of academic excellence and the advancement of knowledge, universities play a pivotal role in acknowledging outstanding contributions from individuals who have significantly impacted their respective fields. Amity University recognizes and celebrates such achievements through the conferral of honorary doctorates and professorships. It emphasizes the institution's commitment to excellence and the pursuit of knowledge.

- The recipients of honorary doctorates and professorships often bring with them a wealth of experience, expertise, and influence. By associating the university with such esteemed individuals, the institution's prestige and reputation are elevated. This, in turn, contributes to attracting top talent, fostering collaboration, and establishing the university as a leader in academic and research endeavors.

- Honorary awards also serve as a source of inspiration for the university's academic community, including students, faculty, and staff. Recipients, typically leaders in their fields, bring with them valuable connections, partnerships, and opportunities for the university to engage with the broader academic and professional community.

- Amity University has so far bestowed **219 Honorary Doctorate** degrees to distinguished persons who have made a mark at National and International level for their outstanding research & academic contributions and leadership out of which **30 were awarded in 2023.**

- In addition, the University has also awarded **37 Honorary Professorships** to renowned Scientists, Industrialists, Technocrats in the year 2023 taking the total figure of **Honorary Professors to 365.**

- The details of Honorary Doctorates and Honorary Professorship awarded for the year are shared below:-

HONORARY DOCTORATES AWARDED IN 2023

AUUP Noida Campus			
S. No.	**Name**	**Designation/ Position/ Organisation/ University at the time of Award**	**Awarded on**
1	Shri R.G. Agarwal	Group Chairman, Dhanuka Agritech Limited	13-Dec-23
2	Dr. Bhaba Nanda Das	Cardio Thoracic & Vascular Surgeon Apollo Heart Institute, Indraprastha Apollo Hospital	08-Dec-23
3	Padma Shri Dr. Mahipal S. Sachdev	Chairman Centre for Sight, New Delhi	08-Dec-23
4	Dr. (Mrs.) N. Kalaiselvi	Secretary, DSIR & DG, CSIR	08-Dec-23
5	Prof. Srikant M. Datar	Indian-American economist and the Dean of Harvard Business School	23-Feb-23
6	Prof. Soumitra Dutta	Peter Moores Dean and Professor of Management, Said Business School, University of Oxford	22-Feb-23
AUUP Dubai Campus			
1	His Excellency Marwan Ahmed Bin Ghalita	Chief Executive Officer of Real Estate Regulatory Agency, Dubai Land Department	15-11-2023
2	His Excellency Abdulsalam Al Murshidi	President of Oman Investment Authority	15-11-2023
3	Shri Rajiv Nayar	Sr. Advocate	27-01-2023

Amity University Haryana			
1	Prof. Ajay K. Sood	Principal Scientific Advisor to the Govt. of India	10.02.2023
2	Prof. (Dr.) Lalit Kumar	Chairperson, Oncology and Bone Marrow Transplant, Artemis Hospital	10.02.2023
Amity University Rajasthan			
1	Shri Hari Babu Srivastava	Director General (Technology Management) DRDO	03.02.2023
2	Dr. Navin Dang	Founding and Governing Council member of IPAQT	03.02.2023
3	Dr. Sanjeev Kumar Varshney	DST, Govt. of India	03.02.2023
Amity University, Madhya Pradesh			
1	Mr. Arun Bharat Ram	Founder and Chairman of SRF Ltd.	25.02.2023
2	Dr. Ajay Kumar Singh	DS and DG, Life Sciences, DRDO	29.02.2020
Amity University Jharkhand			
1	Mr. Wagh Girish Arun	Executive Director, Tata Motors Ltd.	20.04.2023
2	Dr. Saurabh Varshney	Executive Director & CEO, AIIMS, Deogarh	20.04.2023
Amity University Kolkata			
1	Dr. Ramji Singh	Executive Director, AIIMS, Kolkata	16.03.2023
2	Dr. Arun Pattatheyil	Head, TMC Cancer Hospital, Newtown, Kolkata	16.03.2023
Amity University, Mumbai			
1	Dr. Robert Suskind. M.D.	Dean , US Medical Schools	18.03.2023
2	Dr. (Mrs.) N. Kalaiselvi	Secretary, DSIR and Director General of CSIR	18.03.2023

3	Mr. Amitabh Chaudhry	Managing Director and Chief Executive Officer, Axis Bank	18.03.2023
4	Dr. Rajeev Agarwal	Chief Surgical Oncologist at Medanta Hospital, Gurugram	18.03.2023
5	Shri Nishith Desai	Founder, Nishith Desai Associates	18.03.2023
Amity University Patna			
1	Mr. Sandeep Engineer	Chairman and MD, Astral Limited	03.03.2023
2	Dr. Gopal Krushnapal	Executive Director, AIIMS, Patna	03.03.2023
Amity University Chhattisgarh			
1	Dr. Sushil Trivedi	Member of Sahitya Academy, Ministry of Culture,Govt.of India, Member of Hindi Advisory Board of the Academy, Member of the Steering Committee of the State Council of Educational Research and Training and the Executive Chairman of Pt. Madhav Rao Sapre Literary Research Center, Raipur	23.02.2023
2	Prof. (Dr.) Nitin Madhusudan Nagarkar	Director, AIIMS, Raipur (Chhattisgarh)	23.02.2023
3	Mr. Kamal Kishore Sarda	Chairman & MD, Sarda Energy & Minerals Ltd.	23.02.2023

HONORARY PROFESSORSHIP AWARDED IN 2023

AUUP Noida Campus			
S. No.	**Name**	**Designation / Position/ Organisation / University/ at the time of Award**	**Date of Award**
1	Dr. Rakesh Mahajan	Senior Consultant Endovascular and Vascular Surgeon Indraprastha Apollo Hospital	08.12.2023
2	Dr. Sanjiv Kandhari	Managing Director Dr. Kandhari's Skin & Dental Clinic	08.12.2023
3	Prof. Peter Proksch	Former Director, Institute of Pharmaceutical Biology and Biotechnology, University of Düsseldorf, Germany	06.12.2023
4	Dr. Pramod Kumar	Group Delivery Head (Vice President) for Govt. & PSU vertical. Tech Mahindra Ltd.	13.10.2023
5	Dr. Vigyan Mishra	Chief of Lab – North, Neuberg Diagnostics	17.08.2023
6	Dr. Vishal Paragbhai Nanavaty	Senior Scientist - Research Projects Neuberg Center for Genomic Medicine	17.08.2023
7	Dr. Rituparna Datta	Manager, Data Science, Capgemini Technology Services India Limited Banglore India	21.07.2023
8	Mr. George Angelo	CEO, Bisleri International Pvt. Ltd.	18.05.2023
9	Prof. (Dr.) Jacques Pouyssegur	CNRS Research Director Exceptional Class University Cote d'Azur CNRS, IRCAN and centre A. lacassagne, Nice, France	31.03.2023
10	Prof. Marina Kreutz	ProfessorDepartment of Internal Medicine III, University Hospital Regensburg, Germany	31.03.2023
11	Prof. Andrew D. Westwell	Professor School of Pharmacy and Pharmaceutical Sciences, Cardiff University UK	31.03.2023

12	Prof. Godefridus J. Peters	Professor of Pharmacology Amsterdam University Medical Center, Netherlands	31.03.2023
13	Prof. William Lowry	Associate Director of Education and Technology Transfer, UCLA Broad Stem Cell Research Center; Professor, Molecular, Cell and Developmental Biology, University of California, USA,	31.03.2023
14	Prof. Apurva Sarin	Distinguished Scientist, Institute for Stem Cell Science & Regenerative Medicine (inStem), Bengaluru & Dept. of Biotechnology, Delhi	31.03.2023
15	Prof. Luca Gattinoni	Director (Functional Immune Cell Modulation) Professor, University of Regensburg: Regensburg, Bayern, Germany	31.03.2023
16	Mr. Sanjay Gupta	President and CEO at Minda Corporation, former Vice President in NXP Semiconductors.	24.03.2023
17	Lt. Gen. (Dr.) S. P. Kochhar	Director General, COAI (Cellular Operators Association of India), former CEO of the Telecom Sector Skill Council (TSSC).	24.03.2023
18	Prof. (Dr.) Harry E. Ruda	Stan Meek Chair Professor in Nanotechnology, Director, Centre for Advanced Nanotechnology, Professor, Department of Materials Science and Engineering Professor, Ted Rogers Department of Electrical and Computer Engineering, University of Toronto (UT), Toronto, Ontario, Canada	23.03.2023

19	Dr. Seàn McLoone	Director, Centre for intelligent and Autonomous Manufacturing Systems & Professor, Queen's University Belfast UK	02.03.2023
20	Dr. Suresh Vishwakarma	Senior Engineer, and Ex-Adjunct Professor, University of Trinidad and Tobago, IET Representative - Western Canada, Past Member - Communities Committee America, Chairman - Chartered Engineers Pacific, Vancouver, Canada	01.03.2023
21	Dr. Rajesh Khanna	Director, NYU pain Research Center	23.01.2023
22	Prof. (Dr.) Mark S. Nixon	Professor in School of Electronics and Computer Science University of Southampton, UK	20.01.2023
23	Dr. Anastasios Oulis Rousis	Imperial College London, UK & CEO and Co-founder at Smart Power Networks (SMPnet), UK	19.01.2023
24	Prof.(Dr.) Abhinav Valada	Director of the Robot Learning Lab at the University of Freiburg, Germany	19.01.2023
25	Dr. Keishin Kimura	President, Japan Yoga Therapy Society	13.01.2023
AUUP Dubai Campus			
S. No.	**Name**	**Designation / Position/ Organisation / University/ at the time of Award**	**Date of Award**
1	Dr. Manish Arora	Senior Advocate, Supreme Court of India	27-Jan-23
2	Adv Mohammad Salman	Emirati lawyer & Chairman of Mohammed Salman Advocates and Legal Consultants,	27-Jan-23
3	Prof. Hassan Bouadar	Vice President Legal, Regulatory & Human Resources - Fedex	10-Mar-22

S. No.	Name	Designation / Position/ Organisation / University/ at the time of Award	Date of Award
Amity University Haryana			
1	Shri Prateek Kishore	Director, TBRL, DRDO	10.02.2023
2	Dr. Arumugam Jayakumar	The University of Texas MD Anderson Cancer Center	10.02.2023
3	Prof. Slawomir Milewski	Vice-Rector for Scientific Research, Professor of Cracow University of Technology	10.02.2023
Amity University Rajasthan			
1	Dr. Prafull Gadge	CEO & Principal Scientist, Biome Technologies Pvt. Ltd. Ahmednagar (Maharashtra)	03-Feb-23
Amity University Madhya Pradesh			
1	Prof. (Dr.) Sukhsimranjit Singh	Judge Danny Weinstein Managing Director of the Straus Institute for Dispute Resoloution at Pepperdine University Caruso School of Law	25.02.2023
2	Ms. Reshmi Menon	Recruiter, for APAC and Europe, Middle East and Africa (EMEA)	25.02.2023
Amity University Chhattisgarh			
1	Mr. Hemant Kumar	Group Legal Advisor, L&T Ltd.	23.02.2023
Amity University Punjab			
1	Prof. K. N. Pathak	Professor Emeritus, NASI Platinum Jubilee Fellow, Former INSA Senior Scientist Former Vice Chancellor Panjab University, Chandigarh 160 014	20-02-2023
2	Prrof. S.S. Grewal	Ex- Director, PAU Zonal Research Station For Kandi Area, Ballowal Saunkhri, P.O. Takarla-144521, Distt. Nawanshahr, Punjab Former Sr. Consultant Soil & Water Conservation/ Watershed Management (United Nations)	20-02-2023

Dr. (Mrs.) N. Kalaiselvi, Secretary, DSIR (Department of Scientific & Industrial Research) & DG, CSIR (Council of Scientific & Industrial Research) receiving receive the Honorary Doctorate from Founder President Dr. Ashok K Chauhan and Dr. Atul Chauhan Chancellor AUUP at Amity University Noida

Honorary Causa Doctor of Science (D. Sc) Degree being awarded to Dr. Ajay Kumar Sood, Hon'ble Principal Scientific Advisor to Govt of India by Founder President Dr. Ashok K Chauhan, Chancellor Dr. Aseem Chauhan, Dr. W. Selvamurthy President ASTIF and Prof. P.B Sharma, Vice- Chancellor at Amity University Haryana

Chapter - 8 SCIENTIFIC SOCIAL RESPONSIBILITY

- Amity University stands as a beacon of scientific social responsibility, aligning its academic and research endeavors with the betterment of society. Through a combination of cutting-edge research, socially relevant programs, and ethical conduct, the university plays a pivotal role in addressing contemporary challenges and fostering a positive impact on the world.

- By actively embracing scientific social responsibilities, Amity University contributes not only to the advancement of knowledge but also to the creation of a more sustainable, equitable, and socially responsible society.

- **Socially Relevant Programs:** Amity University offers academic programs designed to address societal needs. These programs encompass a wide range of disciplines, including social sciences, public health, and environmental studies. Graduates from these programs are equipped with the skills to contribute meaningfully to societal challenges.

✓ **Community Engagement:** The university actively engages with local communities through outreach programs. These initiatives include health camps, educational workshops, and skill development programs, demonstrating a commitment to the betterment of society.

✓ **Social Entrepreneurship:** Amity supports and incubates social entrepreneurship ventures that focus on solving societal problems. By nurturing a culture of social innovation, the university contributes to economic development while addressing pressing social issues.

✓ **Environmental Sustainability:** Amity University is committed to sustainable practices, integrating environmental responsibility into its operations. The campus incorporates eco-friendly infrastructure, waste management systems, and renewable energy sources. Additionally, the university conducts research on environmental issues and advocates for sustainable practices.

- **Amity Community Radio**
- **Human Value Quarter (HVQ)**
- **Free Physiotherapy Clinic**
- **Mental Health Clinic :** "Sambodhi"
- **Awareness of Legal Rights:** "Samadhan"
- **Family dispute redressal centre**


Students of Amity Legal Aid Society visit Tihar Jail


Student during the blood donation camp

AMITY HUMANITY FOUNDATION

- ✓ **Amitasha :** Girl Education
- ✓ **Atulasha :** Boy Education
- ✓ **Women Empowerment : SWAYAM SIDDHA**
- ✓ **Community Health :** HIV/AIDS Awareness camps
- ✓ **Rehabilitation** of differently abled
- ✓ **Rural Upliftment :** Village adoption

AMITY HUMANITY FOUNDATION
REKINDLING HOPE

- **Amity Institute of Indian System of Medicine**
- **Amity Centre for Yoga Education, Therapy and Research**
- **Amity Institute of Homeopathy Research**
- **Health Checkup & Blood Donation Camps**
- **Training of Rural Women & Farmers**
- **Herbal Garden & Seed Distribution center**
- **First International Film Festival – 2022, "The Promethean Space" : ASCO, ASFD & Vigyan Prasar**
- **Science films for addressing environmental issues**


GPS Map Camera
Ranchi, Jharkhand, India
E/383, near Ishwar Enclave, Hindpiri, Ranchi, Jharkhand 834001, India
Lat 23.35402°
Long 85.322398°
15/02/23 09:12 AM GMT +05:30
Google


GPS Map Camera
Ghasibari, Jharkhand, India
566H+QVQ The Open Field, Ghasibari, Jharkhand 835221, India
Lat 23.162023°
Long 86.229453°
10/02/23 12:31 PM GMT +05:30
Google


TECHNOMETER CLUB


GPS Map Camera
North 24 Parganas, West Bengal, India
Google

Chapter - 9 RESEARCH ECOSYSTEM

9.1 RESEARCH CENTERS & CENTERS OF EXCELLENCE

- Amity University has also established research centers & Centers of Excellence which stands as vibrant embodiments of our commitment to the UNSDGs, championing a transformative agenda for global and national benefit. Aligned with the UN SDGs, these centers serve as epicenters of research, innovation, and education, systematically addressing critical challenges that span environmental sustainability, social equity, healthcare, education, and beyond.

- The campus-wise list of such centers along with glimpses of activities undertaken:

Amity University Uttar Pradesh - Noida

Amity Food & Agriculture Foundation (AFAF)	**Amity Centre for Bio Control and Plant Disease Management (ACBPDM)**	**Amity Institute of Herbal Research and Studies (AIHRS)**	**Amity Centre for Agricultural Extension Services (ACAES)**
Amity Centre for Translational Research (ACTR)	**Amity Centre for Artificial Intelligence (ACAI)**	**Amity Institute of Genome Engineering (AIGE)**	**Amity Centre for Carbohydrate Research (ACCR)**

Inaguration of Indo-Tunisia Mini Symposium


Amity Center for Artificial Intelligence

Dr. Ashok K. Chauhan, Hon'ble Founder President addressed during the Inauguration of Amity Society for Nuclear Security & technology exhibition at AUUP Noida

Amity Centre for Spintronic Materials (ACSM)

Amity Centre for Astronomy and Astrophysics (ACAA)

Amity Institute of Oceanography & Atmospheric Sciences (AIO&AS)

Amity Institute of Water Technology and Management (AIWTM)

Amity Centre for Antarctic Research and Studies (ACARS)

Amity Mega Centre for Natural and Man-Made Calamities

Amity Centre for Interdisciplinary Research (ACIDR)

Amity Centre for Yoga Education, Therapy and Research (ACYTER)

Amity Centre for Cancer Epidemiology and Cancer Research (ACCECR)

Amity Centre for Nano Medicine (ACNM)

Amity Society for Nuclear Security

Amity CIMA Centre of Excellence

Centre for VUCA Studies (CVS)

Reiki Foundation Center for the Science of Happiness

Centre of Excellence for Sustainable Development

Amity Scientists during studies at Antartica

Yoga Day celebration at Amity

Amity University Uttar Pradesh – Lucknow

- CoE in Photonics and Optoelectronics
- CoE For Research-Driven Media Activities
- CoE in Financial Risk Management and Data Analytics
- Centre for Cyber Forensics and information Security

Amity University Uttar Pradesh – Greater Noida

- Aries Centre of Excellence
- Amity CISCO Academy
- Amity AWS Academy
- Amity Academy of Drones (AAD)
- Virtual Cyber Labs

Events organized by research centers at Amity University Uttar Pradesh

Amity University Haryana

CoE for Financial Analytics	Amity Centre for Linguistics Studies	Kiran Majumdar Shah Centre of Affordable Innovation	CoE for Bio-Energy and Bio-Fuels
CoE for Nano Science & Technology	Centre for BRICS Studies	Yunus Social Business Centre (AUH-YSBC)	CoE of Robotics & Artificial Intelligence
CoE for Stem Cell	AYUSH-Amity Herbal Garden and Medicinal Plants Distribution Centre	Centre for Big Data and Computational Biology	Centre for Air Pollution Control (ACAPC)
Centre for Drug Design and Discovery	Centre for Innovation In Education	CoE for Detection of Fake News and Disinformation	Nobel Laureate Kailash Satyarthi Centre for Child Rights & Development
Centre for Entrepreneurship, Innovation Incubator & Startups	CoE in Indic and Sanskrit Studies	Centre for Ocean Atmospheric Science and Technology (ACOAST)	

Events organized by CoE of robotics and AI at Amity University Haryana

Amity University Rajasthan

- Amity Center for Positivism & Happiness
- Amity Centre for Ocean, Atmospheric Science & Technology (ACOAST)
- Yunus Social Business Centre (YSBC)
- Amity Center for Water Studies and Research (ACWSR)
- Amity Center for Nanobiotechnology and Nanomedicine (ACNN)


Events organized by CoE at Amity University Rajasthan

Amity University Madhya Pradesh

- CoE for Environmental Conservation and Biodiversity
- Amity Centre for Detection of Fake News and Disinformation
- CoE for Chemical, Biological, Radiological and Nuclear (CBRN) Mitigation
- CoE for Nanobiotechnology and Alternative Medicine
- CoE for Smart City-Gwalior
- CoE for Tribal Development Centre

Events organized by CoE at Amity University Madhya Pradesh

Amity University Chhattisgarh

CoE on Tribal Studies / Development

CoE in Ayurvedic Medicine & Research

CoE on Robotic Process Automation (RPA) Technologies

CoE for Laws Relating to Intellectual Property Rights (IPR)

CoE on Gender Studies

Events organized by CoE at Amity University Chhatisgarh

Amity University Mumbai

Centre for Computational Biology and Translational Research (CCBTR)

CoE in Astrobiology

Center for Drug Discovery and Development (CD3)

Centre for Proteomics & Drug Discovery (CPDD)

Centre for Nuclear Biotechnology (ACNB)

Events organized by CoE at Amity University Maharastra

Amity University Jharkhand

- **Amity Centre for Research and Innovation Excellence (ACRIE)**

Events organized by CoE at Amity University Jharkhand

Amity University Bihar

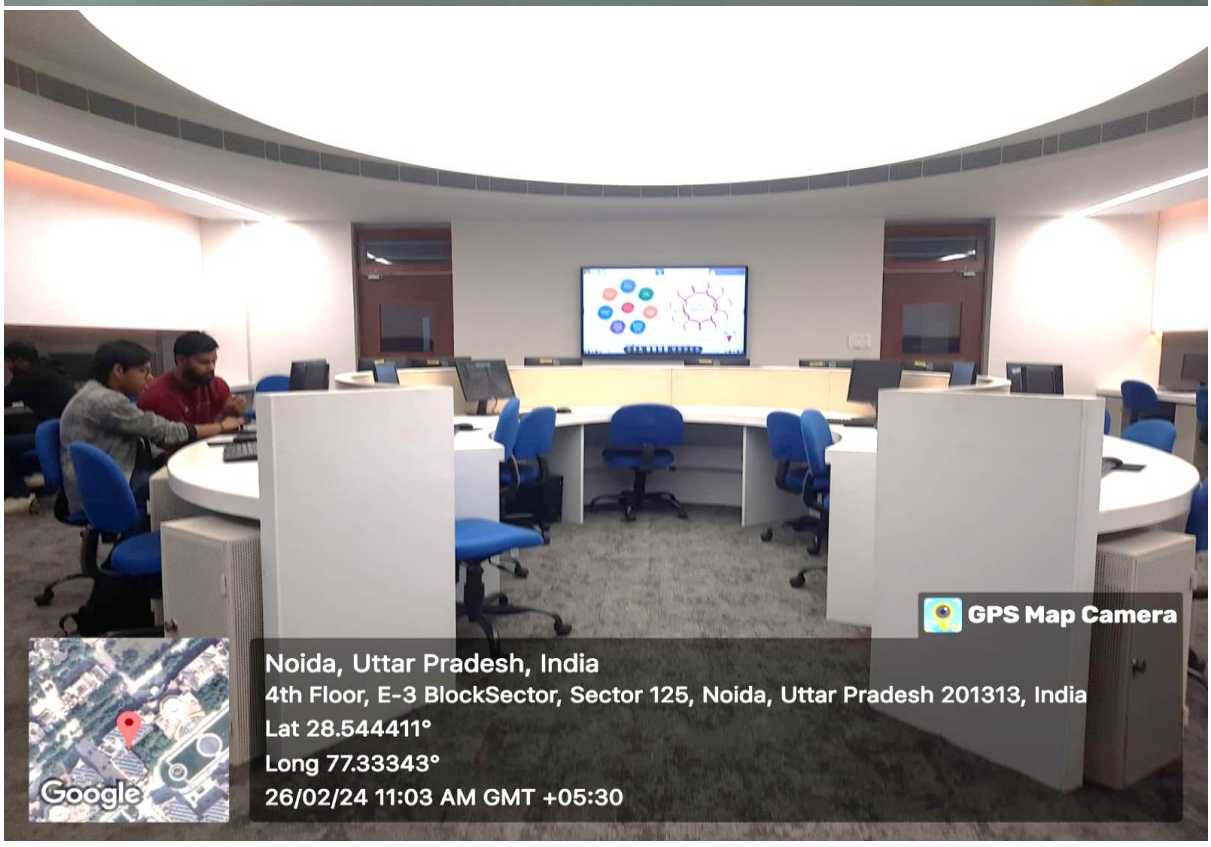
- **Amity Innovation and Incubation center**

Events organized by CoE at Amity University Bihar

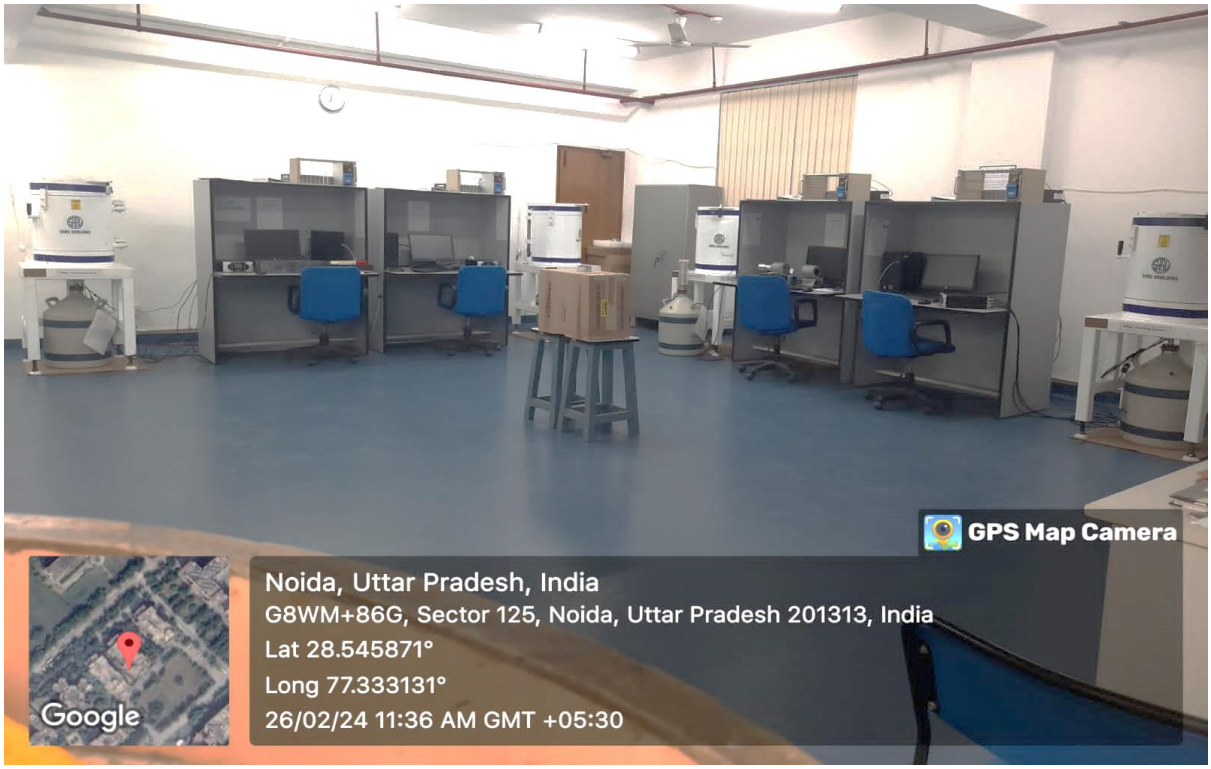
9.2 Research Infrastructure


HIGH PERFORMANCE COMPUTING SETUP
HIGH SPEED CAMERA
COMPACT THERMAL CAMERA
Keyence LK-H2
LabVIEW Front Panel
Accelerometer
Acrylic sheet with thin film membranes
3/4/2024

Amity Centre for Artificial Intelligence

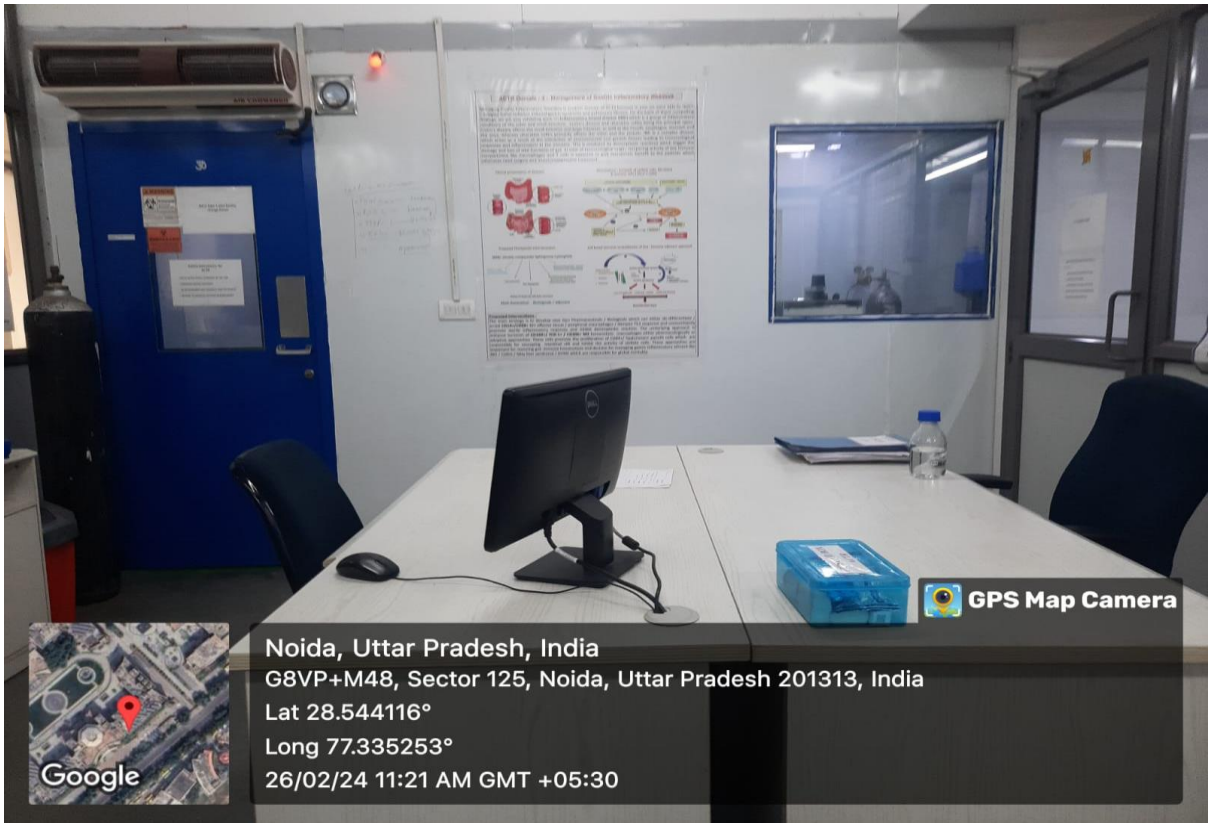


Amity Nuclear Security Education Labs



Amity Brain and Neuroscience Research Laboratory

Amity Centre for Translational Research



9.3 Research Clusters

Thematic research Clusters in areas of national and global relevance have been established with following objective and mandate to act as force multiplier for synergy in Amity Group.

- **Objective:** To pool, Optimize and leverage the Expertise and Infrastructure for Research and Innovation.
- **Mandate:** Promote Intra & Inter Department and Campus Collaboration to synergize knowledge, experience& Connects through Joint research, Publication Project, Seminars etc.
- **Determined Activities:**
    - Joint R&D activities like Experiments, Projects Submissions, Research students.
    - Organize workshops, Seminars Visits, Share knowledge and good Research lab practices.
    - Promote Intra and inter Dept/Cluster and Campus collaboration.
    - Leverage Knowledge Strength & connect of faculty members and adjacencies.

- Presently, 12 Thematic Clusters are functional with the focus on interdisciplinary research and innovations in Science & Technology. These clusters are formed to bring together our brilliant faculty members, researchers, scholars, and students who share common research interests.

Cancer Biology	**Energy**	**Environment, & Climate Change**	**Food & Agriculture Biotech**
Artificial Intelligence & Robotics	**Genome Engineering**	**Cyber Security & Computer Science**	**Space & Defence Technologies**
Public Health	**Quantum Technologies**	**Drug Research**	**New Materials**

- Some of the activities undertaken under these Clusters in 2023 are summarised below-

  - ✓ Interactive Session/Guest Lecture followed by a workshop on "Caenorhabditis elegans: A unique biotechnological tool for life sciences" by Prof. Rakesh Pandey is an emeritus scientist at the CSIR-Central Institute of Medicinal and Aromatic Plants (CIMAP), Lucknow.

  - ✓ Interactive Session and Guest Lecture on "Nanotechnology and Vaccines, Ovarian cancer diagnosis, prognosis and personalized medicine" by Prof. **Magdalena Plebanski**, Director: Biomedical and Health Innovation enabling Capability Platform. Head: Translational Immunology and Nanotechnology School of Health and Biomedical Sciences, RMIT University, Melbourne, Australia and Dr Ruchika Ojha, Vice Chancellor's Research Fellow, STEM College, RMIT University, Melbourne, Australia.

  - ✓ Awareness Program on Mental Health by Prof. Vibha Sharma, Professor: Clinical Psychology, Institute Of Human Behaviour & Allied Science and Dr. Shahzadi Malhotra Clinical Psychology, Institute Of Human Behaviour & Allied Science.

  - ✓ Panel discussion entitled " Challenges and Concerns in Women Health in India".

    - **Dr. Manju Puri:** Maternal health during pregnancy with special reference to BMI and anaemia, special health needs in perimenopausal and menopausal women
    - **Prof K N Saraswathy** Changing Trends in Reproductive Trajectories of women impact on evolution.
    - **Dr. Manoj K Das** "Importance of pregnancy and post-pregnancy period for the mother-child dyad and long-term outcomes"
    - **Dr. Neeta Dhabai**. Anemia , Hypothyroidism, Reproductive tract infections and Preconception health (as these are related to our research) under the broad title of "Everyday Challenges in Women's health"
    - **Prof. Anu Gauba**, "Lack of Maternal health"
    - **Dr. Shazina Saeed**: women's perspective on nutrition and how it affects health and menstrual hygiene.

9.4 Pathbreaking Scientific Achievements Deliberation

- ✓ ASTIF organises "Pathbreaking Scientific Achievements" series to celebrate the incredible research work undertaken by its young faculty members. The objective of these interactions is to showcase the appreciable efforts of Amity faculty and give them an enhanced learning environment.

- ✓ Experts from outside Amity who are related to the research undertaken by these researchers are invited for guidance and suggestions so that a fruitful outcome is achieved out of the innovation.

- ✓ The deliberations are attended by all relevant Faculty members, Ph.D. scholars and students of Amity Universe.

- ✓ The following faculty members presented their research in the year 2023.

    - Dr. Monalisa Mukherjee spoke on "An Unexplored Avenue of Self-assembly in the Genesis of Exotic Nanostructure."
    - Dr. Durgesh Tripathi spoke on "Heavy metals and toxic nanoparticles detoxification in plants for improving the crop productivity."
    - Dr. Mallika Chatterjee spoke on "Understanding Neurobehavior in Health and Disease during Development using Various Model Organisms."

Experts invited:

1. **Dr. Sampat Raj Vadera,** Deputy Director, IIT Jodhpur, Professor, Department of Physics, IIT Jodhpur
2. **Dr. Himadri B Bohidar,** Former Professor, School of Physical Science, Jawaharlal Nehru University, New Delhi
3. **Dr. Rupesh Deshmukh**, Associate Professor, Department of Biotechnology, Central University of Haryana, Mahendragarh, Haryana
4. **Prof. Shivesh Sharma**, Full Professor and Former Head, Department of Biotechnology, Motilal Nehru National Institute of Technology (MNNIT), Allahabad, Prayagraj, India
5. **Dr. Usha Panjwani,** Scientist 'F', Defence Institute of Physiology and Allied Science, DRDO, New Delhi
6. **Prof. Pankaj Seth,** Professor, National Brain Research Centre
7. **Dr. Vigyan Mishra**, Chief of Lab – North, Neuberg Diagnostics





Glimpse of Pathbreaking scientific deliberations at AUUP Noida

Chapter - 10 RESEARCH HIGHLIGHTS

AMITY UNIVERSITY UTTAR PRADESH

INGENIOUS RESEARCH SOLUTIONS PRIVATE LIMITED

AMITY UNIVERSITY

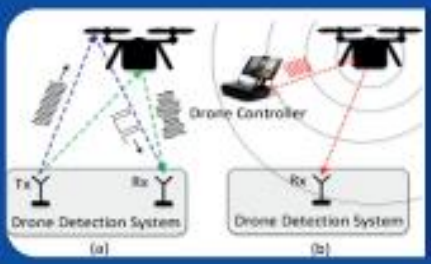
UNIQUE INNOVATIVE SOLUTIONS

Intelligent Satellite Image (Optical/ SAR) Analysis System
Intelligent Ship & Aircraft detection (37133 images of CGI plane, DOTA, planesnet, shipsnet, HRSC 2016, XView3 challenge and boat images dataset); Intelligent troops concentration and Adhoc Construction detection

Intelligent Autonomous Unmanned Ground Vehicle (UGV)
All-terrain movement and Obstacle handling capability; Self-Independent mapping & Navigation; Independent Traction Control of Wheels/ Axel; Secure Data transmission to control; Capable of handling any unforeseen circumstances based on Cognitive Technology; Maneuver and move control based on Environment & Operational situation; Built-in Self diagnostic

Cognitive Spacecraft Health monitoring
An Intelligent Inferencing system is used to design an optimized cognitive system for analyzing the collected data to perform self-calibration, which is capable of real-time, reliable and interpretable decision-making, and which can make decisions on future operations based on real-time scientific observations and help prevent catastrophic situations.

Dark Vessel detection using SAR Image Analysis
SAR images can be analyzed for keeping a track on "dark vessels" used for Illegal, unreported, and unregulated (IUU) fishing activities. The developed model is capable of analyzing the SAR image and intelligently detecting the ships and classifying them based on their length.

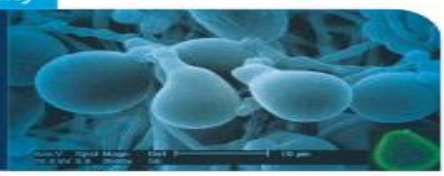


Low cost Drone Detection & Tracking system
Low cost Drone detection system based on Acoustic detection and Image processing with low cost radar system interfaced through Intelligent detection systems; Range prototype 2 km; Extendable with amplifiers and sensitive audio systems.

Unique innovative product developed by Amity Faculty

ROOTONIC THE MAGIC FUNGUS

PROMOTES AGRICULTURE, HORTICULTURE AND FOREST PRODUCTIVITY



Rootonic - A Novel Root Endophyte

Model Organism

Origin & Discovery

Growth on Synthetic Medium

Piriformospora indica: Symbiotic fungus, isolated from Hot Desert (+50 °C) also effectively works in Cold Desert (-18 °C)

MANUFACTURING & APPLICATION

BIOCONTROL OF DISEASE - BOTTLE GOURD

FUNCTIONS AND CAPABILITIES
- Promotes plant growth • Provides resistance against diseases
- Helps in value addition of harvest • Improves soil fertility

TECHNOLOGY HIGHLIGHTS
- Easy to culture • Applicable to large number of plants
- Easy to formulate • Simple one time seed/seedling/tree application

PLANT GROWTH PROMOTION AT EXTREME LOW TEMPERATURE

SPECIFICATIONS
- Biomass: Piriformospora indica • Carrier: Magnesium Sulphite (Talcum Powder)
- Colony Forming Unit Count: 104/gm • Moisture Content: 8-10% • Shelf Life: One year at room temperature

HNB9: NOVEL PHOSPHATE SOLUBILIZING FUNGAL BIOFERTILIZER

PRODUCT FEATURES AND CHARACTERISTICS

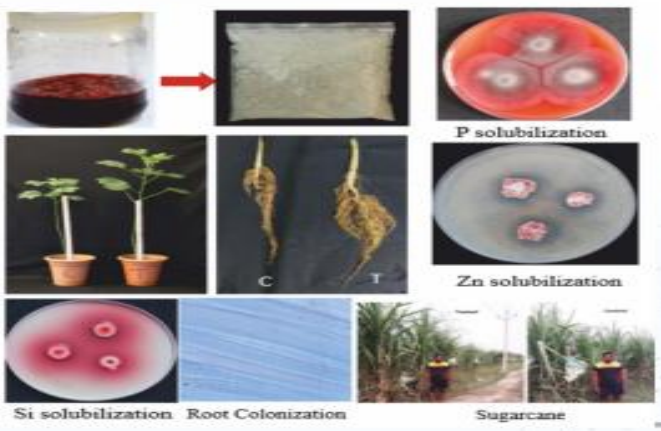
Talaromyces albobiverticillius (HNB9) is an axenically cultivated, novel root colonizing patented phosphate solubilizing fungal strain

UNIQUE SELLING POINTS

Colonization of plant roots by fungus results in pronounced growth enhancement and crop yield

NEED AND DEMAND

The fungus has exhibited various plant growth promoting (PGP) activities like phosphate, zinc, silica, iron solubilization and auxin production etc.



A NOVEL BIOPESTICIDE FOR AGRICULTURE

PRODUCT FEATURES AND CHARACTERISTICS

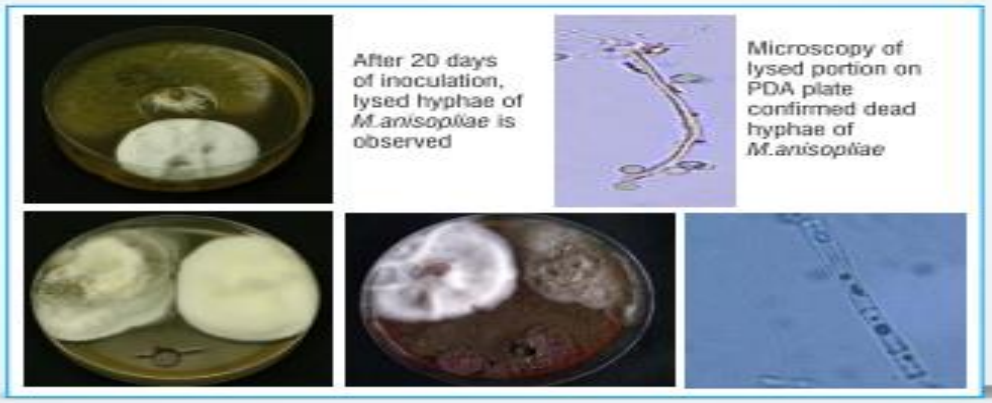
- Talaromyces albobiverticillius (formerly known as T. purpureogenus) HNB9 is an axenically cultivated, novel root colonizing patented phosphate solubilizing fungal strain
- *Metarhizium anisopliae* and *Beauveria bassiana* are incompatible entomopathogenic fungi
- Co-Cultivation of *M. anisopliae* and *B. bassiana* with the fungus HNB9 resulted in positive interaction between the two incompatible entomopathogenic fungi.

UNIQUE SELLING POINTS (USPs)

Colonization of plant roots by fungus results in pronounced growth enhancement and crop yield.

NEED AND DEMAND

The consortia has potential to be wide range insect biocontrol agent in agriculture.



After 20 days of inoculation, lysed hyphae of *M.anisopliae* is observed

Microscopy of lysed portion on PDA plate confirmed dead hyphae of *M.anisopliae*

Bi and Tripartite interaction: After 20 days no lyses of *M.anisopliae* is observed due to *B.bassiana* in the presence of Culture Filtrate/HNB9

A NOVEL BIOAGENT CONSORTIA FOR AGRICULTURE

PRODUCT FEATURES AND CHARACTERISTICS

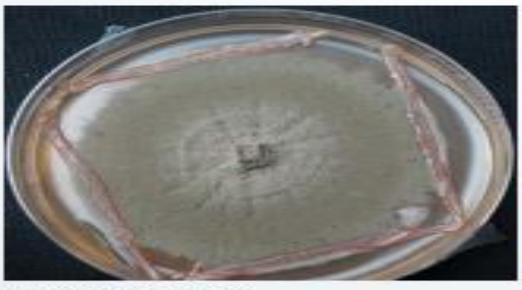
- Talaromyces albobiverticillius (formerly known as T. purpureogenus) HNB9 is an axenically cultivated, novel root colonizing patented phosphate solubilizing fungal strain
  - — Bacillus subtilis MB 2 NAIMCC-B-01316 is a moderately salt tolerant, phosphate solubilizing and auxin producing strain
  - — Co cultivation of the bacteria with fungi increases fungal spore count and size significantly

UNIQUE SELLING POINTS (USPs)

- Colonization of plant roots by the consortia results in pronounced growth enhancement and crop yield
- The consortia is nontoxic and has the potential to be a multifunctional bioagent in agriculture

NEED AND DEMAND

- The technology has application in addressing the problems of sustainable agriculture.



Dual Culture Interaction

Root treatment of Rice plantlets

Treatments	Control	HNB9	HNB9 + Bs
Yield (Qt/Acre)	18.34	26.26	29.64

Final Yield data of rice variety PB1718

DEVELOPMENT OF NOVEL AND THERMOSTABLE PROTEASE ENZYME WITH SIGNIFICANTLY HIGH ACTIVITY FOR INDUSTRIAL APPLICATIONS

Product Features and Characteristics

Proteases have applications in several biotechnological processes, research, and many industries including pharma sector. The Protease Enzyme Purified from Ginger variety is-

- Novel
- Significantly High activity
- Source- Ayurvedic herb (Ginger-household spice)
- Thermostable
- Anticancer potential (In vitro)

- Protease enzymes account for nearly 60% of the industrial enzyme market in the world.
- According to Markets and Markets, the industrial enzymes market is projected to reach USD 8.7 billion by 2026.
- The global protease market is projected to grow at a CAGR of 5.8% during the forecast period (2022 - 2027) (Mordor Intelligence Report).
- Acc.to Market research future-Proteases Market is expected to grow at a 5.5% CAGR and reach USD 5,762.9 Million by 2030

Industrial Application Development Avenues

USP in relation to Industrial Sectors
A novel thermostable protease enzyme from plant source (household spice) with significantly high specific activity
USP in relation to Pharma sector
A novel thermostable protease enzyme from plant source (household spice) with significantly high specific activity exhibiting substantial cytotoxic effect against Human Breast Cancer Cells

Unique Selling Points (USPs)

The Novel Protease candidate have applications in several biotechnological processes, research, and industries including-

- Food processing
- Detergent
- Breweries
- Textile
- Leather
- Dairy
- Baking
- Beverages
- Poultry
- Infant Formula
- Bakery
- Soy
- Silk
- Meat
- Chemical
- Industrial Waste Mgmt.
- Silver Recovery
- Pharmaceutical Industries

Unique innovative waste water to drinkable water system by Amity Scientists

SELF-SUSTAINED SYSTEM TO CLEAN INDUSTRIAL WASTEWATER AND GENERATE ELECTRICITY SIMULTANEOUSLY WITHOUT ANY EXTERNAL SOURCE

Purify waste-water by using its own Generated Electricity

Electricity & Water are basic requirements of living beings. Our planet is mostly covered by water but drinking water is only 2.5%

- A novel system in which two specially designed electrodes of a particular material are dipped in wastewater.
- This generates electricity. Utilising this generated electricity, the developed system cleans wastewater.
- This is a self-sustained system.

There are two basic needs for all: • Electricity • Clean Water
Developed a unique method where just especially designed two electrode of particular materials are dipped in the waste water. It generates electricity and cleaned the waste water simultaneously by its own electricity without using any power source or any chemical from outside. This is a self-sustained system.

CLEAN WATER IN TWO STEPS

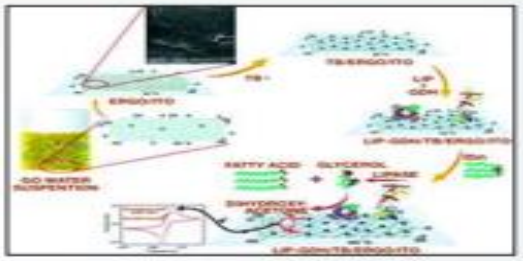
- Provides semi-cleaned water in 1st step- used for irrigation, gardening, toilet, etc.
- By using its own generated electricity, the RO system can be powered to produce drinkable water.

The developed system can be scaled up for industrial use. The electrode's life is long and can be reused after it with clean water.

BIENZYMATIC REUSABLE REDUCED GO-BASED BIOSENSORS FOR ELECTROCHEMICAL SENSING OF CHOLESTEROL AND TRIGLYCERIDE

Product Features and Characteristics

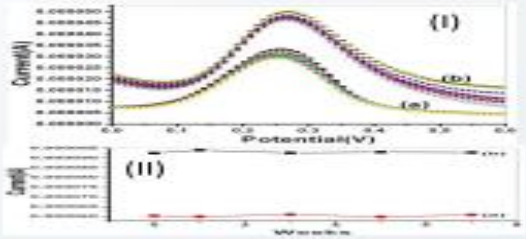
- Novel ERGO platform has been explored to fabricate a triglyceride (TG) biosensor via co- immobilizing of lipase (LIP) and glycerol dehydrogenase
- Detect tributyrin in the range of 50–400 mg dL^{-1}, high sensitivity of 29 pA mg^{-1} dL, low response time of 12 sec, tested with serum samples
- Novel amperometric cholesterol biosensor based on bienzyme system such as cholesterol oxidase (ChOx) and horseradish peroxidase
- Offer wider linearity (35 to 500 mg/dl), higher sensitivity (4.22 µAmM^{-1}), high shelf life (8 weeks), low response time (19s)



Schematic presentation of formation of LIP-GDH/TB/ERGO/ITO electrode for Triglyceride sensing

Need and Demand

- Level of cholesterol and triglyceride in serum are important parameter in the diagnosis and prevention of heart diseases
- The risk of CAD and hyperlipidemia necessitates estimating the amount of triacylglycerols in blood
- Existing cholesterol biosensors suffer from low reliability, poor shelf life and low sensitivity and interference from other oxidisable species such as ascorbic acid (AA), uric acid (UA), and acetaminophen
- Developed sensor offers smart, simple, sensitive, rapid response and online monitoring strategy for common man usage



(I) DPV curves for reusability testing for Cholesterol biosensor (current vs. potential plot with 100 mg/dl analyte for 8 times)

(II) Shelf life measurement for 8 weeks

ELECTROCHEMICAL DEVICE FOR SENSING OF AFLATOXIN B1 IN GROUNDNUT EXTRACT

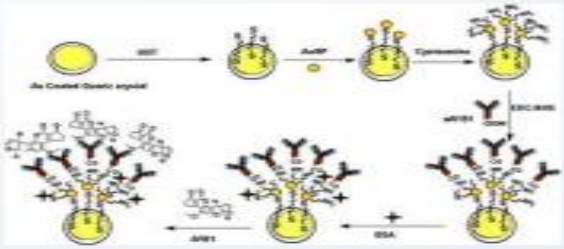
Product Features and Characteristics

- Handheld electrochemical sensor for rapid detection of Aflatoxin B1 with a linear range of 15 to 60 ppb and a sensitivity of 7.853 count ppb^{-1} cm^{-2}
- Validated by LC-MS/MS by IARI, Accuracy level +/- 12% with LC-MS/MS
- Based on a novel self-readable smart sensing Aflatoxin B1 immunoprobe

Hand-held electrochemical device connected to self readable immunoprobe

Need and Demand

- Aflatoxin B1 is identified as group 1 carcinogenic(IARC) and also causes immune weakness, reproduction deficiency, malnutrition, and growth impairment
- Indian Council of Medical Research (ICMR)-Lucknow stated 21% of groundnut in India is unfit for human consumption due to aflatoxin
- Rapid detection and affordable sensor for detection of AflatoxinB1 in ground nut extract is highly needed from socio-economic point
- Argentina ($875M), United States ($594M), Brazil ($320M), and Sudan are also huge exporters of groundnut, developed device projects huge demand in these countries



Schematic illustration of immunoelectrode antigen and antibody interaction

Unique Selling Points (USPs)

- Rapid detection and affordable sensor
- Total detection time 30 min including ground nut extract

MOBILE APP INTEGRATED HAND-HELD ORGANOPHOSPHATE PESTICIDE (OP) SENSOR

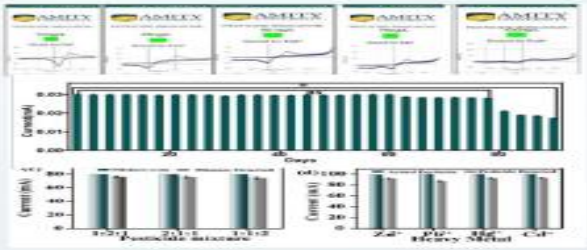
Product Features and Characteristics

- Rapid hand-held, mobile app interfaced Electrochemical sensor for quantitative detection of Organophosphate pesticide in vegetable extract
- Operates over a sweeping potential for detection of OP (upto 9.8 ng L^{-1}) ,mixtures of OP and spiked sample vegetable extract (deviation < 15%) over linear range (10–100 ng L^{-1}) with high sensitivity (6.39 μA ng^{-1} Lcm^{2}), short detection time (10 min)
- Validated with standard potentiostat, and possess remarkable stability for 3 months

OP detection Hand-held sensor with plugged in OP probe and connected to mobile phone by BLE

Need and Demand

- OP is neurotoxin and banned by Environmental Protection Agency (EPA)
- Despite of the fact, high efficacy, low cost, and easy availability, global market consumption of OP pesticide is predicted to reach 94.76 million by the end of 2027
- Existing commercially available sensors are qualitative, while OP tends to accumulate so their precise level (quantitative) detection is mandatory
- Boon for on-site detection of OP by farmers, safety regulators, supply chain retailers and even common man through a mobile app

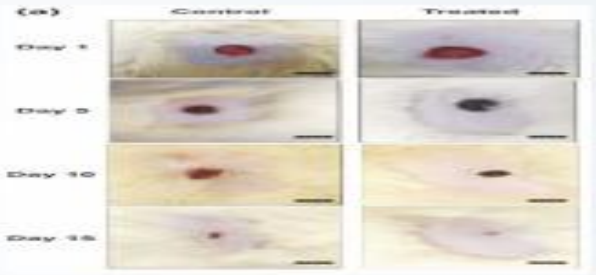


(a) Detection of different concentration of OP pesticide (b) stability of OP probe (c)Detection of OP mixture(d) Study of interference of heavy metal ions

N-DOPED CARBON NANO SHEET BASED HYDROGEL COMPOSITE FOR WOUND HEALING

Product Features and Characteristics

- Hydrogel nanocomposite for biomedical and/or pharmaceutical applications of non-biodegradable polymeric hydrogels containing antimicrobial two dimensional (2D) carbon nanosheets (CNS) as fillers.
- Provide pH-responsive composite composition of material in which nanosized 2D carbon sheets are uniformly dispersed in polymer matrix
- The composite may be used as carrier for therapeutic agent for long duration and as a dressing for topical wounds, cuts, etc. on human body and. Accelerates diabetic wound healing.
- Increased mechanical strength, good viscoelastic properties and could slowly release the therapeutic payload at a particular pH in a controlled fashion.
- Can control wound moisture,absorb inflammatory cytokines and dead cells from the wound and form a barrier to the microbes.
- Facilitate quicker proliferation and migration of epithelial cells, fibroblast and keratinocytes to the wound bed leading to faster wound healing.



(a) In vivo study depicting control and hydrogel nanocomposite treated photograph of Wistar rat wounds at days 1, 5, 10, 15. Control (Panel I) Treated (Panel II). Scale bar 10 mm.

Unique Selling Points (USPs)

- Medicament to treat diabetic wound leading to improved patient condition.
- Can decrease chances of amputation and other complications.

Synthesised hydrogel nanocomposite

VEGETARIAN HARD CAPSULE COMPRISING THE PALATABLE POLYMERS AND COMPLETELY DEVOID OF GELATINE. GRANTED PATENT AND AVAILABLE FOR TRANSFER TO THE INTERESTED ENTITIES

Product Features and Characteristics

- Vegetarian capsules comprising of palatable polymers and completely devoid of gelatin.
- Capsule possesses multilayer forming ability, so their thickness, tensile strength, and drug release profile can be easily customized based upon the need.
- Already granted patent and ready technology for transfer at commercial scale.

Disintegration Test

pH Time	(minutes)
1.2	10
7.4	20
9.0	30

Unique Selling Points (USPs)

- ☑ Safe & Non- Toxic
- ☑ Multimolecular polymeric film can control drug release

Effect of Temperature and Time

30 Days | 90 Days | 120 Days | 180 Days

BIOGENIC CARBON QUANTUM DOTS IN STEM CELL BIOLOGY FOR DIRECTING CHONDROGENESIS

ABOUT TECHNOLOGY

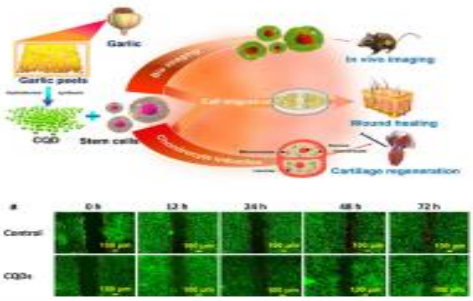
- Carbon Quantum Dots (CQDs) are synthesized from biowaste using simple hydrothermal one pot and rapid process.
- Exceptional biocompatibility, *in-vitro* and *in-vivo*.
- The development method of CQDs are eco-friendly, and cost-effective
- Improved therapeutic efficacy of Mesenchymal Stem Cells (MSCs) in a noninvasive domain of administration.
- Extend the period of safe tracking of the MSCs in the body to cognize the pharmacological characteristics.

METHODOLOGY

UNIQUE FEATURES OF THE TECHNOLOGY

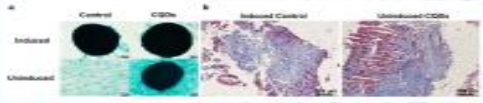
- Carbon Quantum Dots (CQDs) exhibit unique photoluminescence property for bioimaging.
- Facilitate Stem cell migration, imaging and simultaneously directing chondrogenesis
- This was orchestrated without the use of chondrogenic induction factors.
- This technology has immense potential in stem cell biology and regenerative medicine
- The complete technology is made under make in India program and the technology ready for transfer to an industry for production.

PRODUCT FEATURES AND CHARACTERISTICS



Imaging and analysis of wound closure in an *in vitro* model after CQDs treatment, using IHF cells

CHONDROCYTE INDUCTION BY CARBON QUANTUM DOTS WITHOUT USING INDUCTION FACTORS



HORIZONS OF MATERIOBIOLOGY IN BIOMEDICAL APPLICATIONS

Technology 1: Carbon Quantum Dot-Nanocomposite Hydrogel as Denovo Nexus in Rapid Chondrogenesis

- Addition of CQDs as a nanofiller increased hydrogels swelling.
- CQDs addition into hydrogels were stable till 0.1%, above that the gels were having very high swelling ratio and were unmanageable.
- CQDs decreased the crystalline nature of hydrogels, making them more biocompatible.
- Lower Young's modulus was observed CNC-0.1, making it ideal for chondrocyte induction.
- Chondroinductive investigations revealed these CNCs can induce chondrogenesis within 14 days.

Technology 2: Biogenic Carbon Quantum Dots as a Neoteric Inducer in the Game of Directing Chondrogenesis

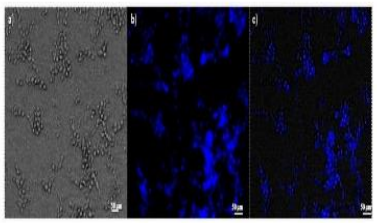
- Carbon Quantum Dots (CQD) facilitate Stem cell migration, imaging and simultaneously directing chondrogenesis
- This was orchestrated without the use of chondrogenic induction factors.
- This technology has immense potential in stem cell biology and regenerative medicine
- CQD are synthesized from biowaste using simple hydrothermal process.
- The CQD are highly biocompatible.
- The complete technology is made under make in India program and the technology ready for transfer to an industry for production.

Technology 3: Click chemistry tailored benzimidazole functionalized triazole block-co-polymer for emergence of exotic chimaeric nano-crystalsomes.

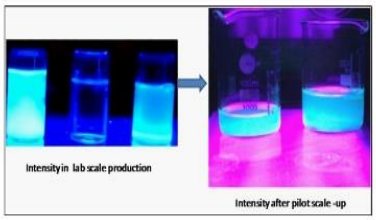
- The product is an antibacterial agent and also a potential candidate for wound healing.
- First reported chimaeric crystalsomes via click chemistry. The innovation lies in the synthesis of an exotic chimeric single-crystalline nano-crystalsomes from 'Click-tailored' benzimidazole functionalised triazole based copolymer, which has been patented.
- A new strategy for developing a nano-framework. Utilizing click monomer consisting 1,2,3 triazole group, synthesized via copper catalyzed 1,3 dipolar cycloaddition reaction along with dimethyl amino propyl methacrylamide (DMAPMA).

Technology 4: Highly fluorescent and biocompatible Sulphur doped Graphene quantum dots from agro industrial bio-waste for bio imaging.

- First time, we present a facile, largescale, one-step, economical, template- and catalyst-free synthesis of sustainable, sugarcane molasses driven single crystalline sulphur-doped GQDs (S-GQDs)
- A waste to wonder technique for mass production of S-doped graphene quantum dots from cane molasses.
- The GQD are highly biocompatible, cytocompatible, hemocompatible, histocompatible quantum dots.
- the present invention is to provide a competent candidate to be used as a bioimaging tool and for diagnostic purposes.



DIC image (a) DF-1 cells, (b) DF-1 cells treated with S-GQDs, (c) Overlay image of (a) and (b)

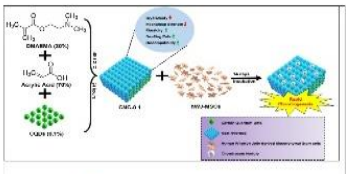


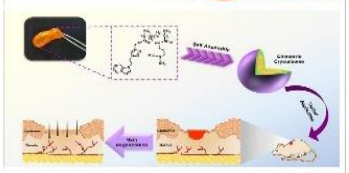
Technology 5: Emergence of Heptazine-Based Graphitic Carbon Nitride within Hydrogel Nanocomposites for Scarless Healing of Burn Wounds

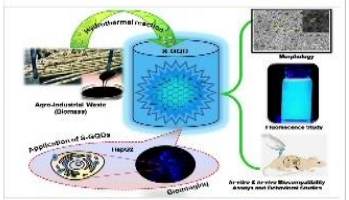
- The technology develops a pH responsive hydrogel nanocomposites for scarless healing of burn wounds.
- The product can be used as hydrogel patches, or as ointment with tunable formulations, for topical wound healing for controlled release of a specific therapeutic agent at skin pH for a long period of time, preferably from 1 to a maximum of 3 days, without having the need to replenish the therapeutic drug.
- The hydrogel nanocomposite are prepared via ex-situ synthetic approach for large scale industrial application.
- The synthesis procedure is done without the use of toxic chemical cross-linkers
- The hydrogels remain dimensionally stable in the pH range from about 1.2 to 9.0

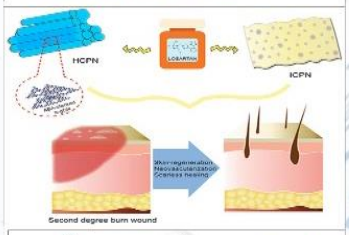
Technology 6: Graphene Quantum Dots in the Game of Directing Polymer Self-Assembly to Exotic Kagome Lattice and Janus Nanostructures

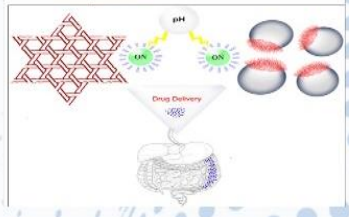
- Graphene Quantum Dots form Exotic Kagome Lattice and Janus Nanostructures by Polymer Self-Assembly
- The technology is utilized for targeted delivery of 5-fluorouracil in the colon cancer
- The technology provide hydrogel-graphene quantum dots (GQDs) nanocomposites and a method for targeted, sustained and controlled release of therapeutic agents
- The nanocomposite can excellently perform pH sensitive drug delivery of a biologically active agent for site-specific drug delivery in a sustained manner.
- The GQDs nanocomposite are highly biocompatable.
- The GQDs are synthesized from agrowaste.











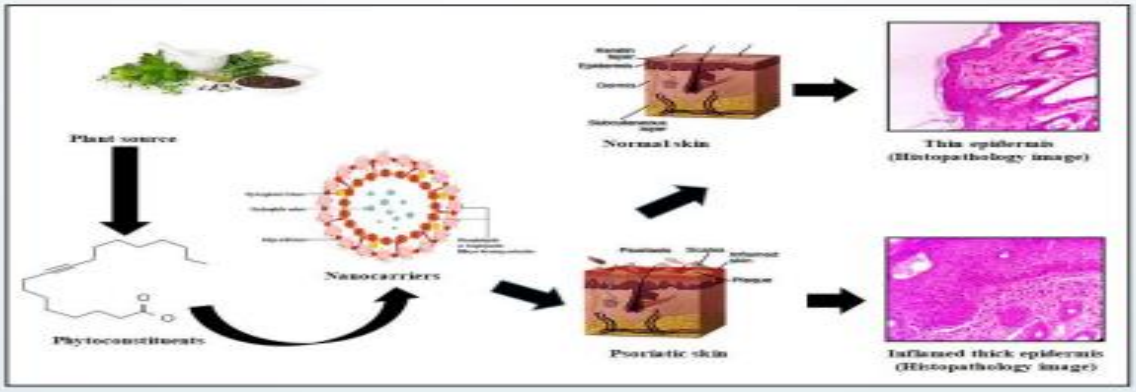
HERBAL REMEDY FOR PSORIASIS

Product Feature and Characteristics

- Herbal product for the treatment of psoriasis which is a chronic inflammatory, multi-system disease associated with considerable morbidity and co-morbidity.
- Majority of patients prefer the topical treatment for psoriasis. The biggest challenge posed by topical treatment is highly resistant stratum corneum which makes conventional creams and ointments reaching deeper layers of skin difficult. Nano formulation is capable of penetrating into deeper layers of skin.

Unique Selling Points (USPs)

- Novel nano delivery system bearing phytoconstituent
- Improved permeation into rigidized psoriatic skin
- Dermatologically tested
- Overcome the limitations associated with conventional formulation available in the market



Unique innovative product developed by Amity Faculty

WATER PURIFIER

AWARD WINNING DEVICE IN
"THE POWER OF IDEAS 2012"

PORTABLE, LOW COST, REUSABLE WATER PURIFIER BASED ON SILVER NANO EMBEDDED POROUS CONCRETE PEBBLES

This unique product has been selected amongst the top 50 innovative ideas, out of 30,000 business plans during the "Power of Ideas" programme, a joint initiative of The Economic Times, IIM, Ahmedabad and Department of Science and Technology (DST), Government of India.

The technology has been awarded the leaders in Innovation Fellowships (LiF): 2015 by Royal Academy of engineering, London.

Amity has developed a reusable, economical and easy-to-carry first of its kind water purifier based on silver nano embedded porous concrete pebbles. The present product, in the form of a small portable dip-dip container, is likely to be priced at an unimaginably low cost as compared to other products in the segment. The eco-friendly purifier provides around 100% decontamination of microbial load in the treated water.

The device has very good reusability and its efficacy remains the same even after 120-125 uses within a time span of 6 months.

UNIQUE FEATURES

- Pocket friendly
- 100% removal of microbial contamination
- Economical & reusable besides being user friendly
- No leaking of nanomaterials or any toxic chemicals
- Does not require any source of energy/ voltage or UV light
- Can be modified in any form i.e, continuous system or water treatment tanks
- Can also be merged with already available treatment system in the market
- Works even in high TDS range
- An alternative to plastic bottles. Prevents environmental pollution by plastics

It was certified by SRL that all the water samples of both Non-Pathogenic as well Pathogenic bacteria's strain becomes 100% free from any kind of Microbial contamination after treatment.

WEARABLE ELECTRO-OPTICAL NO_2 GAS SENSOR

Amity Institute for Advanced Research and Studies (Materials & Devices),
Amity University Uttar Pradesh, Noida
Dr. Devinder Madhwal, Dr. Vivek Kumar, Dr. Prashant Shukla, Nitin Bhardwaj & Dr. V.K. Jai

Patent filed:
May 23, 2023, with
Application no.:
202311035801

NOx are Green-House Gas (GHG) and influence global warming

Nitrogen oxides (NOx) generate from stationary combustion chamber or engines cause numerous undesirable environmental effects. These include negative influences on human and animal health.

Design & Fabricate of wearable system (watch) sensing devices, senses the presence of toxic NO_2 gas in the environment. In comparison to available NO_2 sensors based on electro-chemical, or oxide-based are very expensive., while our is electro-optical-based wearable system is simple, highly sensitive & reproducible.

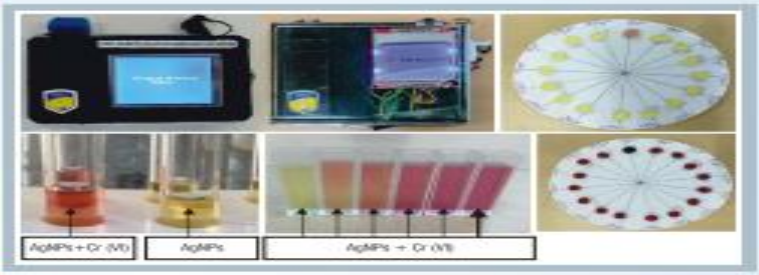
The principle of gas detection is based on the absorption of the wavelength by the gas and detection change in resistance accordingly.

Salient Features

- Wearable Sensing Device
- Rechargeable battery
- Low Cost & Reliable
- Fast response time
- No interference of humidity and temperature changes
- Works at room temperature

POINT OF CARE DEVICE FOR ON-SPOT DETECTION OF CHROMIUM IN CONTAMINATED WATER

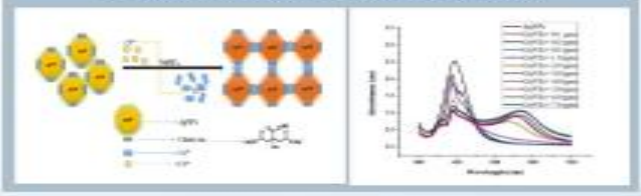
We have developed a device with a small meter of size of mobile phone. It just takes few drops of water and give the quantity of chromium in water. It is highly useful for an instant detection of chromium.



CHROMIUM DETECTION: NEED AND DEMAND

- Chromium (Cr) is one of the toxic environmental pollutants released in the environment due to its wide use in industries such as tanning, corrosion control, plating, pigment manufacture and nuclear weapon production.
- Nearby people and workers are mostly prone to Cr contamination.
- Increased rate of contaminations could leads to national burden of decease & global burden of decease.
- Can decrease other complications due to high cost method of detection.

WORKING PRINCIPAL & CHARACTERIZATION



PRODUCT FEATURES AND CHARACTERISTICS

- Therefore, we have developed a newer electronics with simple algorithms capable of calculating concentration of chromium in liquid medium.

Novelty of the device

- The limit of detection of this device is 0.02 ppm (mg/L)
- Easy to handle & pocket friendly
- Cost effective
- Give both quantitative and qualitative results

FUTURE DEVELOPMENTS

- It can be connect with mobile phone for real time detection and data interpretation.
- Battery can be connect with solar panel to charge anywhere, where light source is available.
- Different type of LED can be used in a single device for many other heavy metal detection.
- It can be calibrated to be used with different type of sample like urine, blood etc.

PORTABLE, SENSING ARRAY SYSTEM FOR THE SAFETY OF WORKERS IN THE MANHOLE OF SEWER

Amity Institute for Advanced Research and Studies (Materials & Devices),
Amity University Uttar Pradesh, Noida
Dr Devinder Madhwal, Dr Prashant Shukla, Mr. Nitin Bhardwaj, Dr. Vivek Kumar, Mr. Rajesh K Samal & Dr. V.K. Jain

An IR Camera assisted detection system for manhole and sewer multi-gasoperations

Software-based sensing array detection unit detects life-threatening gases such as methane, carbon monoxide, ammonia, and Hydrogen Sulfide inside the manhole in real time and displays on the screen the actual concentrations of the gases. The IR camera provides a real-time position of the working men inside manholes.

The system alerts the workers when the gas concentration increases to a safe level. Simultaneously, monitor the health of the workers inside the manhole so that an immediate action can be taken when there is a danger inside the manhole. System can automatically exhaust the gases, & men enter only when it shows the safe limit.

Salient Features
- Fast response time
- Real-time monitoring of workers with IR-CAM
- Portable
- Reliable
- User Friendly
- Can work at remote locations

INDIGENOUS MICRO-SYRINGE PUMP FOR MULTIPURPOSE APPLICATIONS

DESCRIPTION OF DEVICE

- A Micro-syringe pump is a device that flows liquid in control volume rate in the order of micro-liter per second (µL/sec) to milliliter per minute (mL/min).
- The major application of this device is in biomedical as well as in fundamental research of microfluidics and characterizes the surface in terms of hydrophobicity (measuring the Contact Angle, CA and Contact Angle Hysteresis, CAH).
- The micro-syringe pump designed and fabricated at Amity University can flow the volume from nanoliter per second (nL/sec) to milliliter per second (mL/sec) with 98% accuracy.

COMPONENTS USED

- Injection plunger motion by mechanical arrangement
- Pulse Width Modulated (PWM) Motor controller with micro-stepping embedded circuit
- Stepper Motor
- Power supply 12 VDC unit

UNIQUE FEATURES OF MICRO SYRINGE PUMP

- Indigenous
- Low cost
- High accuracy
- Multipurpose application
- Compact and portable

AMITY AGRI-PHOTOVOLTAICS SOLAR FARM

DUAL USE OF LAND FOR FARMERS USING A COMBINATION OF SOLAR PHOTOVOLTAIC PANELS AND AGRICULTURE: AGRIVOLTAICS

Indian Farmers faces lots of challenges due to heavy or no rain, hailstorms, etc.. Sometimes left with no money and suffers very badly. To overcome this problem Amity University has developed a solution by combining Solar Photovoltaic Panels and Food crops to optimise the land use.

Concept of Agrivoltaics:

- Agrivoltaic System involves Solar Panels installation on the fertile land simultaneously. It benefits both Solar energy production and crop production.
- Using Agrivoltaic System Farmers can produce crop and earn money by selling the generated electricity, thereby, increasing their income concurrently.
- Farmers can use the generated solar energy for their household use as well.

Agrivoltaics Farm

In Amity, we successfully installed 10KW & 2KW solar power plant on the Agricultural land, with an optimized design. The partial generated electric power from 2 KW plant is utilizing for water supply from solar water pump (for the usage of irrigation, solar panel cleaning, drinking R.O. water, bathing & toilet purpose) and for other electrical appliances (such as, fan, tube-light, T.V., mobile charger, R.O., etc.)

Complete software modeling has been performed to keep the particular distance in each panel and the height of the solar panel to get the maximum outcome with minimum shadow effect on the crops.

Using the Model of Agrivoltaics, farmers can earn extra money by selling the electric power of about Rs. 10000/month with the 10KW of solar power plant. In addition to this, farmers can utilize small portion of generated electric power, for running water facilities for toilets and clean drinking water; light, fans and most modern facilities even living near his farmhouse, which in in the remote areas.

Agrivoltaics Model can support two major challenges in Photovoltaics

- Increase in solar panel temperature and
- Accumulation of dust on solar panels. which decrease the efficiency of solar panels.
- Agrivoltaics will automatically cool solar panels by evaporation of water (transpiration) due to the crops below the panels.
- Dust from all the solar panels can be cleaned automatically, in 1-2 minutes (with a special design) using water from solar water pump. The same water after cleaning the panels can also be used for the irrigation.

THE CONCEPT OF AGRIVOLTAICS, SUPPORTS THE GOVERNMENT'S SWACHH BHARAT ABHIYAN (CLEAN INDIA MOVEMENT)

Farmer's Cottage near the Agricultural Field:

Farmer can utilize the partial generated solar power for their toilets, lights, fans and plus even for TV, mobile charger, R.O system to have the clean drinking water, etc.

Dust Cleaning on Solar Panels using water from Solar Water Pump

NOVELTY / UNIQUENESS OF THE AGRIVOLTAIC

- Maximizing a use of agricultural land by combining solar energy harvesting and crop growing simultaneously,
- Provide additional income to the farmers by selling electricity,
- Provide safety to the farmer in case of any extreme bad condition.

AMIAQUA - Point of care device for on-spot detection of Chromium in water

Nitesh Kumar, Devinder Madhwal, Abhishek Verma & V.K. Jain

Amity Institute for Advanced Research and Studies (Materials & Devices), Amity University Uttar Pradesh, Noida

Abstract: Chromium (Cr) is one of the toxic environmental pollutants released in the environment due to its wide use in industries. High concentration of Cr (VI) in the body causes respiratory irritation, asthma, gastrointestinal irritation, and several other harmful effects. Therefore, there is a need to develop a device that can efficiently monitor the concentration of Cr(VI).

We have developed a colorimetric sensor for the detection of chromium using citrate-capped silver/gold nanoparticles in water and urine/serum samples of patients. The device is a small meter of the size of a mobile phone. It just takes a few drops of water and gives the quantity of chromium in water. It is highly useful for the "**Instant detection of chromium**" in water samples.

Chromium Detection: Need and Demand

Heavy metals are ubiquitous in nature and being used extensively in industrial processes, exposure to excessive levels could alter the biochemical cycles of living systems

- Chromium (Cr) is one of the toxic environmental pollutants released in the environment due to its wide use in industries such as tanning, corrosion control, plating, pigment manufacture, and nuclear weapon production.
- Nearby people and workers are mostly prone to Cr contamination.
- Increased rate of contaminations could lead to a national burden of disease & and a global burden of decease.
- This device can lead to flexibility in lifestyle
- Can decrease other complications due to the high-cost method of detection.

Our Innovative Device: Features and Characteristics

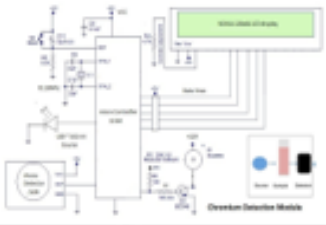
Environmental monitoring through rapid and specific detection of heavy metal contamination in water and biological samples greatest importance.

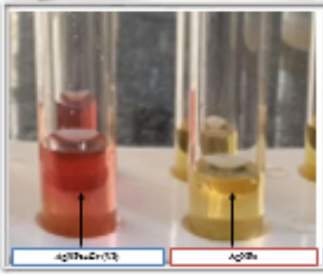
Therefore, we have developed newer electronics with simple algorithms capable of calculating the concentration of chromium in a liquid medium.

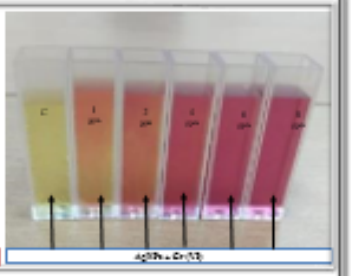
Novelty of the device

- **The limit of detection of this device is 0.02 ppm (mg/L).**
- **Easy to handle, portable & pocket friendly**
- **Cost effective**
- **Give both quantitative and qualitative results**

Innovative Hand-Held Electronic Device





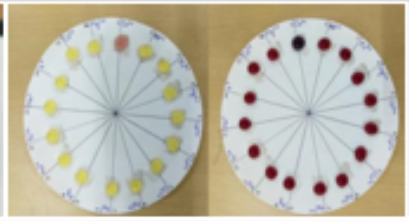


- **Patent Granted:** Application no. 201711036833, Granted on 2023-09-12
- **Acknowledgement:** The work is supported by DST and the product developed under the project given by DST "DST/TM/WTI/2K15/174"
- **Project:** Nanocellulose-based composites for chromium decontamination and speciation in aqueous system.

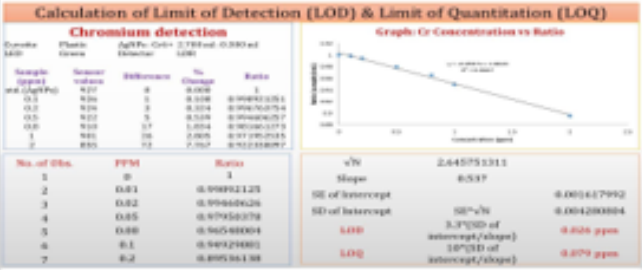
Present Market Access Information

- The heavy metal testing market is estimated at **UDS 2.53** billion in 2017. it is projected to grow at a **CAGR** of **7.6%** (3.65 billion) through 2022.
- Market growth is attributed to the
  - Repetitive occurrence of heavy metal contamination,
  - Stringent regulatory environment and
  - Active evolvement of government and regulatory bodies in monitoring

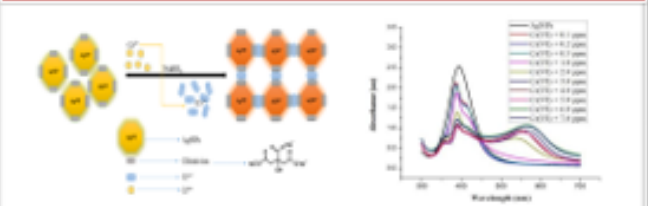
Interference Study with other metals



Calculation of Limit of Detection (LOD) & Limit of Quantitation (LOQ)



Working Principal



Future Developments

- It can be connected to a mobile phone for real-time detection and data interpretation.
- Battery can be connected with solar panels to charge anywhere, where there is no power source.
- Different types of LED can be used in a single device for many other heavy metal detection.
- It can be calibrated to be used with different types of sample like urine, blood

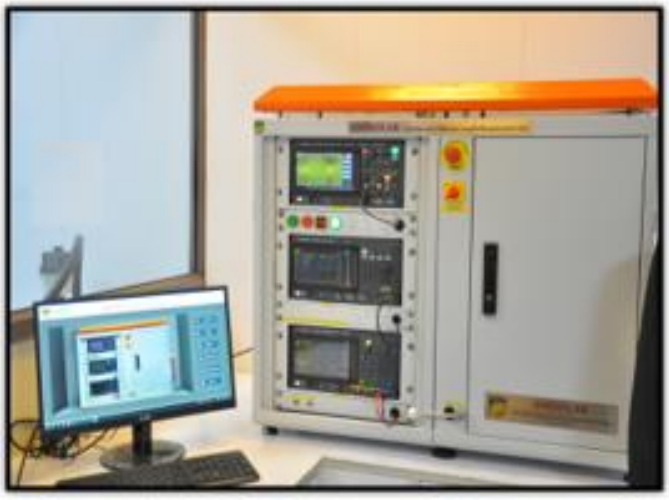
Contact: Technology Query: Dr. Meenakshi Kanojia, Deputy Director, DITT • Email: mkanojia@amity.edu
Technical Query: Prof. (Dr.) V. K. Jain, Distinguished Scientist & Prof., AIARS (M&D) • Email: vkjain@amity.edu

AMISOLAR - *Lifetime and Diffusion Length Measurement Unit*

for minority charge carriers in Silicon Solar Cells and Wafers

Amity Institute for Advanced Research and Studies (Materials & Devices),
Amity University Uttar Pradesh, Noida, U.P.
Prof. V. K. Jain, Dr. Abhishek Verma, Dr. Devinder Madhwal, Dr. Vivek Kumar

Amisolar is an instrument/system which can measure the Lifetime and Diffusion Length for minority charge carriers in Silicon Solar Cells.

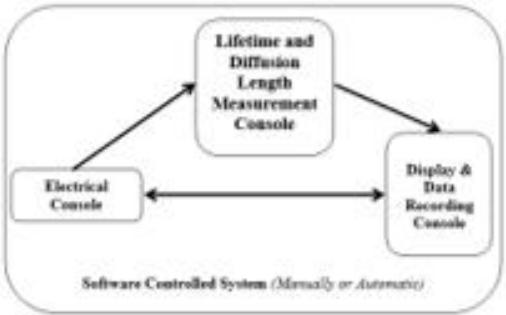


Amisolar can be utilized from any size and shape of solar cells to the latest technology of solar cells with 8" wafer size. Amisolar can build a positive benchmark for all the PV industries and even the electronic component fabricating industries. It will provide a cost-effective solar cell testing tool, which is the most required instrument in all the solar cell manufacturing industries. This too supports researchers and scientists, working in academic or other laboratory organizations.

Technically, when sunlight/photons are falling on solar cell, it produces electron and hole pairs, which should be well collected before they recombine. Therefore, we must measure how much an average time they can take without recombining. More the average time, better will be the collection rate, which will give more output power and so the better efficiency of the cell. One has to measure many times in the fabrication process line of the solar cells; thus, such equipment will be required by all solar cell manufacturing industries.

In academics too, at university, institutes or R&D labs every time the efforts were made to measure this factor, whenever, we are doing any changes in the material or change in design of solar cells or adding some more materials to modify the base or top surface of the solar cells. All research scholars working in the field of solar cell technology need this equipment at R&D labs or universities.

The present equipment has been developed with great efforts by the team including Dr. Abhishek Verma, Dr. Devinder Madhwal, Dr. Vivek Kumar and a few others, under the leadership of Prof. V. K. Jain. The basis of the equipment is completely based on Dr. V. K. Jain's own theory, which was published long back in 1987, in a top journal of USA, when he was in DRDO. Now this equipment is designed and developed as a commercial model at Amity University, Noida, under an important project with financial support provided by DST, Govt. of India, with the Industrial support from M/s Glorisa Technovation India Pvt. Ltd.



Human Thermal Comfort in Helmets using Phase Change Material at Extreme Hot Conditions

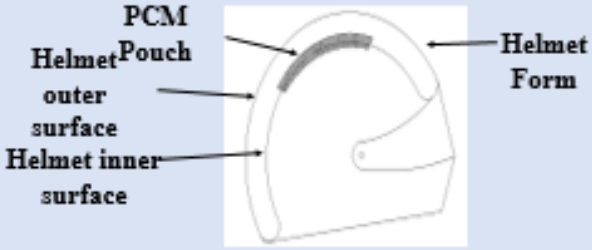
Amity Institute for Advanced Research and Studies (Materials & Devices)
Amity University Uttar Pradesh, Noida
Neeraj Gupta, Vivek Kumar, Abhishek Verma, Nitin Bharadwaj and V. K. Jain

Thermal Discomfort to the Wearer's Head due to Extreme Hot Conditions Leads to

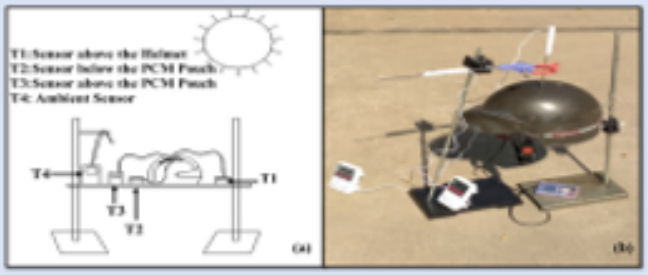
- Hypothermia
- Deadening of senses
- Inability to concentrate during riding



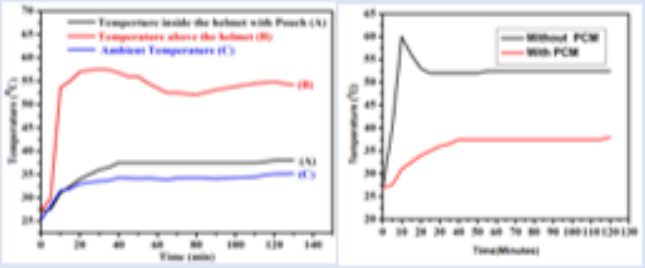
PCM (Novel Cooling Unit) based Pouch Placed Inside the Helmet



Real-Time Analysis

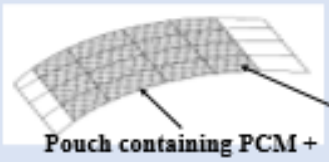


Systematic set up for the study novel cooling unit

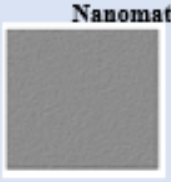
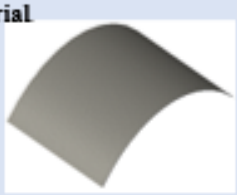


Shows temperature vs time graph with and without PCM nanocomposite

Design and Development of Novel Cooling Unit (PCM-based Pouch) for Thermal Comfort in Helmet a



PCM Pouch Design


Thin and flexible Aluminum foil used for making pouch

PCM Pouch

Characterization of PCM materials using SEM

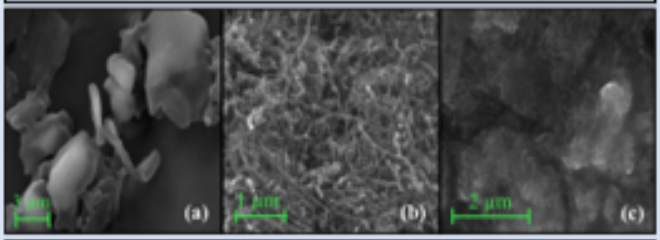


Fig. SEM micrographs of (a) pristine PCM (Eicosane), (b) MWCNTs, and (c) PCM- MWCNTs nanocomposites


PCM-Nanocomposite based Pouch (Novel Cooling Unit) provides Thermal Comfort for around 2 hrs.

Salient Features:

- During sunny days (hot conditions), the helmet's outer surface temperature crosses 40-45 °C
- A novel, reusable cooling unit (PCM-based pouch) placed inside the helmet maintained human thermal comfort at a temperature of 37 °C and remained constant for almost 2 hours.
- After 2 hours, pouch can be re-set by keeping it in shade.
- Specially designed for two-wheelers, desert workers, and miners.

INDIGENOUS PORTABLE AND LOW-COST SOLAR OPERATED ATMOSPHERIC WATER GENERATOR

INTRODUCTION

- The volume of water in the earth's atmosphere as a vapor is evaluated to be about 12900 km3 and Atmospheric water Generator (AWG) is a pragmatic and scalable method for solving potable water scarcity in hot and humid areas.
- The present invention is Atmospheric water Generator (AWG) which produces potable water from the surrounding air up to RH= 45%
- In this device, cooling is Peltier solar based and condensing surfaces are superhydrophobic Aluminium. Heat piped based convective cooling method is developed to extract heat from the 250 Heat from the Peltier system.
- The super-hydrophobic with low contact angle hysteresis Condensing surfaces of 120mm×120mm are fabricated by chemical etching followed by plasma etching.
- The contact angle of water droplets on this condensing surface is 153±5o and the contact angle of hysteresis is ≤8o
- The device has capability to produce water 2 L/hr at cost of Rs 2L/Hr in month of July-September in NOIDA India.

BENEFITS OF ATMOSPHERIC WATER GENERATOR

- AWG creates water from the humidity in air present in ambient atmosphere. Thereby, no depletion of ground water or any other available water resources, Machine's optimum performance ideally requires a minimum humidity level of approximately 40% & above.
- It provides fresh, bacteria free, clean and pure drinking water conforming to all the international water safety standards, AWG create water from air using a patented process.
- The AWG features a superior filter system which ensures that the dispensed water is filtered through a five-stage filter, comprising of Pre-carbon Filter, Sediment Filter, Ultra Filtration, TCR Filter and Ozonation, which removes all unwanted particles, viruses and bacteria and delivers pure drinking water with higher Oxygen levels.
- The AWG dew point also work as a dehumidifier and air filter, thereby performs two tasks at the same time and cost and make home of user less hospitable to allergens such as dust mites, mold and mildew.
- There is no wastage of available water resource, as it does not require water as input. It directly creates water from air. Further, in case of RO, there is lot of wastage of water. However, in case of AWG there is no wastage of water.
- Most importantly, it is affordable, cost effective, easy to install, environment friendly.

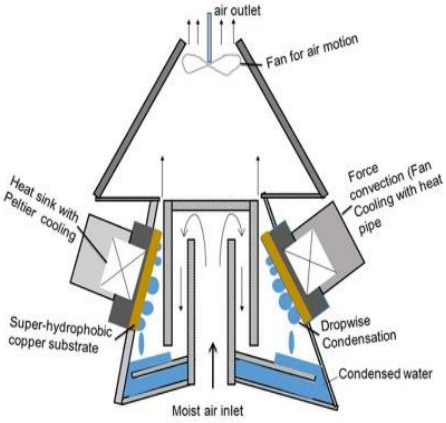


Figure 1: Schematic diagram of proposed atmospheric water generator

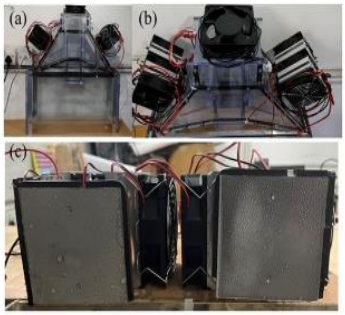


Figure 2: Photographs of the setup (a) Front view of the setup, (b) isometric view and (c) moist air condensation pattern on superhydrophobic surfaces

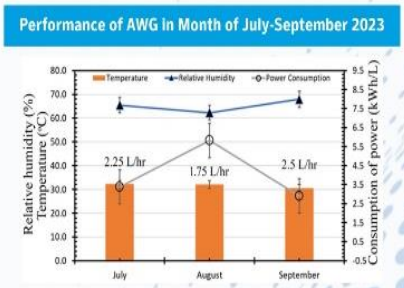


Figure 3: Capacity of water production and Power consumption at various conditions in month of July-September 2023

INDIGENOUS ELECTRIC SCOOTER WITH IMMERSION COOLING BATTERY PACK

DESCRIPTION OF DEVICE

- Immersion cooling based battery pack, drivetrain, light weight frame using polymer composite has been designed and fabricated.
- An Electric Scooter with unique speed control system
- With an Ignition starter Fingerprint Sensor, the Bike will not start the Motor Power until it recognizes the fingerprint, this is to ensure that the vehicle is not stolen.
- The thermal management of the battery will not be air cooled instead it will be a liquid immersed system.
- Efficiency of the battery is close to 98%, thus not resulting in the Battery Catching fire due to overuse of the Vehicle.

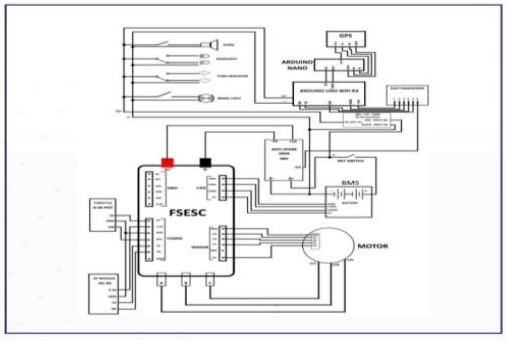


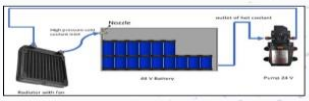
Figure 1: Electrical Circuit diagram of Indigenous Parental Control Electric Scooter

Chassis and Mechanical component drawing of Indigenous Parental Control Electric Scooter

BATTERY PACK AND ITS THERMAL MANAGEMENT

Proposed Configuration of 48 V battery

Assembly of battery packs in box



Assembly of battery packs in box

REGENERATIVE CLUTCH SYSTEM

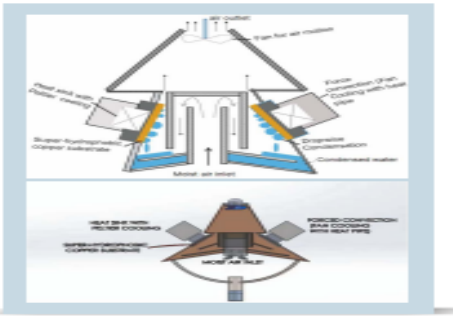
Pinnacle of Automotive Technology

- **Most efficient Plugin Hybrid EV**
  (Pure Engine drive, Pure Electric drive, Electric torque assist)
- **More than just a vehicle**
  (25KW of real-time outboard power)
- **Clever design**
  (Compact enough for any LMV integration)
- **Built around Sustainability**
  (Significantly improved fuel efficiency)
- **Green and Silent**
  (50KW of electric drive capability)
- **Light weight Technology**
  (Vehicle with batteries weighs < 800kg)

But still not expensive (Developed under Rs. 4.5 L)

POTABLE WATER HARVESTING DEVICE FROM MOIST AIR

- A Peltier cooling-based Atmospheric Water Generator (AWG) assembly using super-hydrophobic metallic surface as condensing substrates.
- Peltier with a pumped two-phase cooling system is used for cooling of condensing surface
- Condensing surface is Aluminum super-hydrophobic with low contact angle hysteresis
- Condensing surface is fabricated by chemical etching followed by plasma etching
- Contact angle of water droplets on this condensing surface is $153 \pm 5^{\circ}$ and the contact angle of hysteresis is $\leq 8^{\circ}$
- Have capacity to produce water from moist air up to 25°C and RH = 45%



Atmospheric water generation (AWG) produces potable water from the surrounding air. The volume of water in the earth's atmosphere as a vapor is evaluated to be about 12900 km3. This innovation is a pragmatic and scalable method for solving water scarcity in hot and humid areas of our country.

Type of water harvesting device	Water generation rate (mL/hr)	Power consumption (W)	Environmental condition	specific energy consumption (kWh/m^3)
Present device	185	52	T = 30°C and RH = 75%	665
Amir *et al.* device	66	20	T = 30°C and RH = 80%	922

SO-APT: SOLAR OPERATED AGRO-VEHICLE WITH PORTABLE TOOLS

By: **Suhani Chauhan**
Class XI, Amity International School, Pushp Vihar

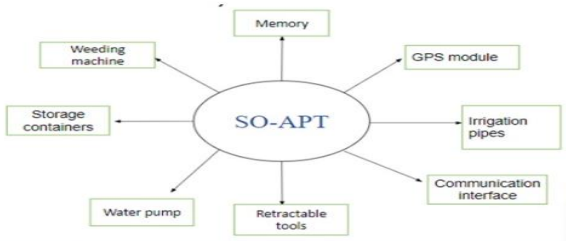
SO-APT is a multi tool integrated, energy efficient, eco-friendly, cost effective Agro Vehicle, appropriately designed as per farmers' needs.

Unique features of the technology

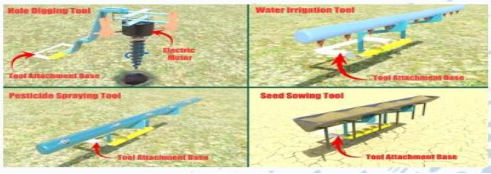
• Fully solar powered • Made of light weight weather proof painted metals
• Solar operated broad wheels •Low maintenance cost • Fulfills Sustainable Development Goal 8- Decent Work and Economic Growth •Tools for irrigation, seed sowing integrated which help in reducing expenses and increasing productivity.

Problems addressed

• Crop yield • Food Security • Optimal use of water, fertilizers, and pesticides.



WORKING PRINCIPLE OF SO-APT



AMITY UNIVERSITY
INDIAN INTERNATIONAL SCIENCE FESTIVAL 2024, 17-20 January 2024

INDIAN INTERNATIONAL SCIENCE FESTIVAL, 2024, Haryana, India

Innovative Concepts in Space Science and Technology

Dekkala Vinay, Raunak Sharma, Yash Raj, Dhruv Panchal, Sanjay Singh, V.R.Sanal Kumar et al.

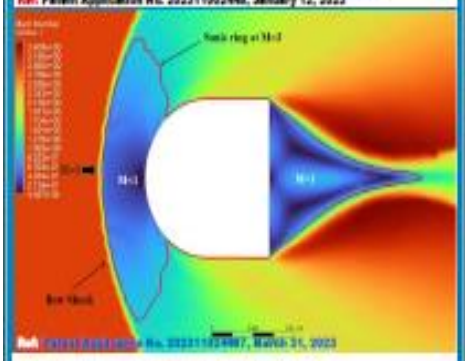
Highlights of Four Innovative Space Projects from Student Entrepreneurs of AMITY

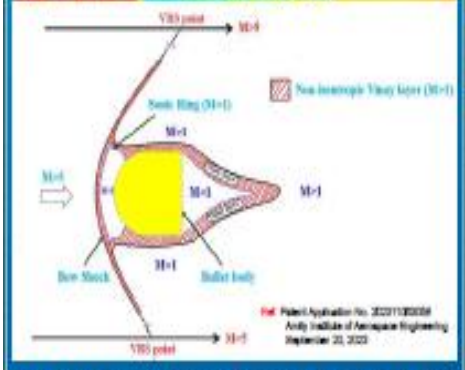
Amity Institute of Aerospace Engineering, Amity University Uttar Pradesh, Noida, India

HYPERSONIC FLIGHT PROJECT

Discovery of Sonic Ring/Jacket Impelling Entropy Waves on Hypersonic Vehicles

Ref: Patent Application No. 202211002448, January 12, 2022





Ref: V.R.S.Kumar, D.Vinay, R.Sharma et al., AIAA 2023-3070

Patent: D. Vinay, V.R.S.Kumar, "Theoretical Discovery of Non-Isentropic Vinay Layer over the Sonic Jacket of Supersonic and Hypersonic Vehicles," Application No. 202311063068, September 20, 2023

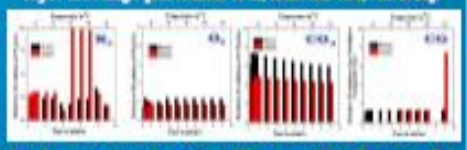
Dekkala Vinay, M.Tech (Aero) | Raunak Sharma, B.Tech (Aero) | Yash Raj, M.Tech (Aero) | Dhruv Panchal, M.Tech (Aero), CEO, Vyadh Aerospace Pvt. Ltd

Contact: vrakumar@amity.edu / dekkala.vinay@s.amity.edu
WhatsApp: +91-8754200501

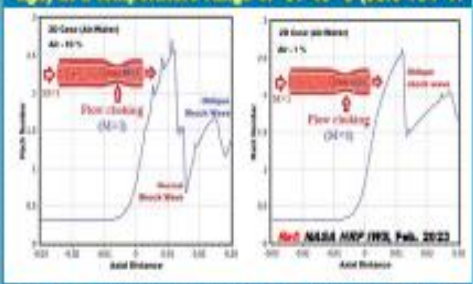
HUMAN SPACEFLIGHT PROJECT

Flow Choking in Human Artery at Gravity and Microgravity Conditions

- V.R.S.Kumar et al [*Physics of Fluids*, 2022] reported that proofs are intensifying on various types of asymptomatic cardiovascular diseases and disorders in humans living on Earth and spaceflight due to flow choking [V.R.S.Kumar et al., NASA NRP IWS, Feb. 2022].
- Microgravity environment decreases plasma volume and increases the hematocrit. It increases the relative viscosity of blood causing an early flow choking in humans in spaceflight due to an enhanced boundary layer blockage [V.R.S.Kumar et al., NASA NRP IWS, Feb. 2022].



In vitro results show that Nitrogen (N_2), Oxygen (O_2), and Carbon Dioxide (CO_2) gases are predominant in fresh-blood samples of the healthy subjects (23-56 age) at a temperature range of 37-40 °C (98.6-104 °F.



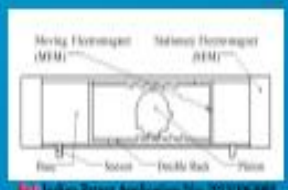
- We have established conclusively through animal *in vivo studies* that flow choking occurs in cardiovascular system due to gas embolism at a critical pressure ratio [Anbu Jayaraman, et al. *Circulation Research*, 2022, 2022;131:AP3028].

Loukik Deshpande B.Tech (Aero) | Swaraj Patil B.Tech (Aero) | Tanishka Verma B.Tech (Aero) | Vedika Garg B.Tech (Aero)

Shivansh Rana B.Tech (Aero) | Adita Kal B.Tech (Aero) | Aayush Raj B.Tech (Aero)

PLANET LANDER PROJECT

Uninterrupted Push-Pull Electromagnetic Propulsion System for Planet Landers

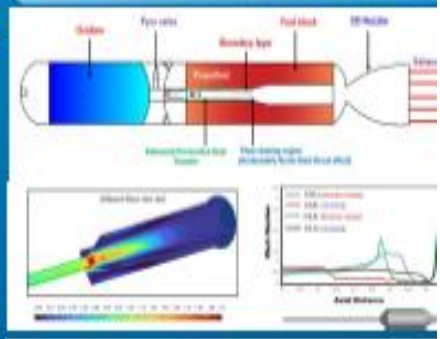


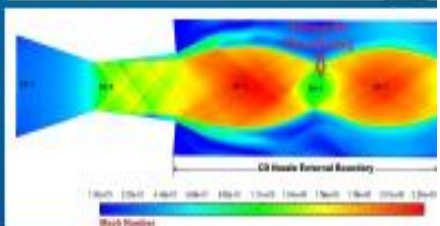
Ref: Indian Patent Application No. 202316063

- The solar/lunar powered push-pull electromagnetic propulsion system is a new addition to the global scientific community and patently a promising device for high-endurance drones and planet landers [V.R.S.Kumar et al., Engineering Reports 2023, Wiley https://doi.org/10.1002/eng2.12703].

HIGH-PERFORMANCE HYBRID ROCKET PROJECT

Detonation Free Dual-Thrust High-Performance Rockets





- The emergence of the detonation-free dual thrust rocket by negating the phenomenon of Sanal flow choking and/or Streamtube flow choking in the development of advanced rocket propulsion systems has brought forth a remarkable innovation that presents several advantages compared to traditional rocket designs [V.R.S.Kumar et al., *Physics of Fluids*, 34, 2022, AIAA 2023-4416].

AMITY UNIVERSITY HARYANA

NASA-AUH COLLABORATIVE RESEARCH PROGRAMS

In a long-term collaborative research effort, a global network station of NASA-AERONET (AErosol RObotic NETwork) site has been successfully established in May 2017 on the roof-top of Academic Block-A of Amity University Haryana, Panchgaon-Manesar-Gurugram for regional air quality and climate research (Fig. 1). Recently, this bi-lateral research project has been extended up to 2032. The valuable data sets (column-integrated aerosol optical depth, size distribution, refractive index, single scattering albedo, phase function, asymmetry parameter, water vapor, fine- coarse-mode fractions, current satellite and long-range transport model trajectories) from this real-time sun-sky radiometer provides almost complete characterization of aerosols over different environments. These datasets are valuable also for developing models for forecast purpose and for calibrating/validating the satellite sensors. Further, this instrument provides the air-health chain monitoring.

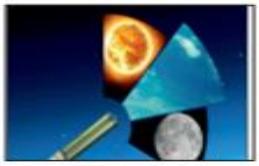


Fig. 1: NASA-AERONET


Fig. 2: MAIA Satellite Mission


Fig. 3: MAIA AMOD


Fig. 4: SAMOSA

The ACOAST-AUH has been selected as one of the sites in this global network. The IIT-D is coordinating these installations in India. Recently, a MAIA AMOD sampler has been installed (Figs.2 & 3), co-located with the existing NASA-AERONET instrument, which has been operating for the past more than 4 years on the terrace of Academic Block-A of AUH. The data from MAIA AMOD would improve our understanding of how aerosols affect local air quality, visibility, and human health through the connections between AOD and fine particulate matter of PM2.5. As a part of the CAL-VAL Program of NASA's satellites(Fig. 4), a Network of Citizen-Enabled Aerosol Measurements for Satellites shows the adequate ground-based measurements of air quality do not exist in most of the country.

BLACK CARBON AEROSOL TRENDS OVER PANCHGAON, HARYANA

A photograph (Fig. 1) depicting [A] Geography around the Amity University Haryana (AUH), [B] Areal view of the University Complex, [C] Four-storey Academic Block 'A' and its terrace where a suit of sensing instruments is installed, and [D] Multi-wavelength Aethalometer used for measurements of simultaneous BC mass concentration (ng/m3) and Biomass Burning (%). Fig. 2 portrays the operation of the Aethalometer by the student, Saurabh Yadav (M.Sc. Project work). Fig. 3 displays the temporal variation of BC mass concentration observed during the study period.

The results suggest that the aethalometer-derived black carbon (BC) aerosol measurements, carried out over a rural (pristine) site, Panchgaon, Haryana State, India during the winter months of 2021–2022 and 2022–2023 indicated the following:

- Good agreement with collocated and concurrent observations from the Air Quality Monitoring Station (AQMS).
- Secular variations in BC mass concentration showed good correlation with those in surface meteorological parameters.
- The biomass burning fire count retrievals from NASA-NOAA VIIRS satellite, and backward airmass trajectories from NOAA-ERL HYSPLIT Model analysis have also been utilized to explain the findings. They reveal that the north-west Indian region contributes maximum to the BC mass concentration over the study site during the study period.
- The observed BC mass concentrations corroborate the synchronous fire count. This information in conjunction with the primary and secondary pollutant concentrations were found to aid the development of mitigation methods to achieve a sustainable climate system.


Fig. 1


Fig. 2

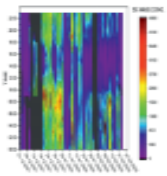


Fig. 3

Acknowledgment: The ACOAST and ACESH gratefully acknowledge the constant support and encouragement from Hon'ble Founder President; Hon'ble Chancellor; President, ASTIF; Vice Chancellor and Pro-Vice Chancellor, AUH. Thanks, are also due to B.N. Holben, M.D. Giles, K. Jason, M.S. Amy of NASA, USA; and N. Athauda, L.Yang, H. Rose, S. Jeremy, C. Sabrina, O. Margaret of Emory University and Prof. Sagnik Dey is Institute Chair Professor at the Centre for Atmospheric Sciences, IIT Delhi.

DEVELOPMENT OF NANO-SENSOR FOR THE DETECTION OF ADVANCED GLYCATION END-PRODUCTS

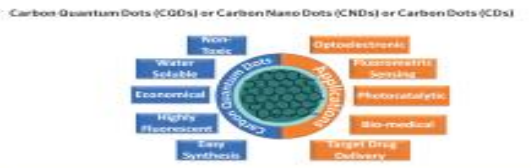
INTRODUCTION TO ADVANCED GLYCATION ENDPRODUCTS

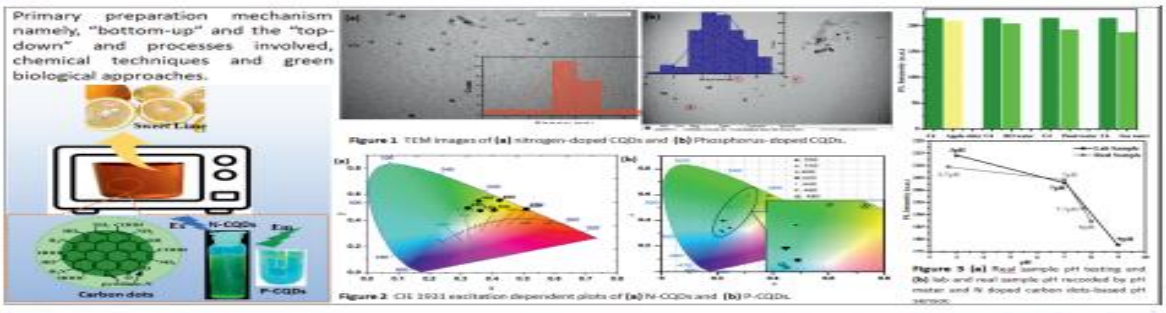
- In India, up to 12% of adults are thought to have diabetes, making it the country with the largest prevalence of the condition worldwide according to the estimates, and by 2045, it is anticipated to reach more.
- In diabetic patients, glucose builds up in the blood since it is not used by the cells for energy.
- When proteins or lipids in the body interact with sugars (like glucose), a cascade of chemical reaction starts that leads to formation of a variety of heterogeneous compounds called advanced glycation end products (AGEs).
- AGEs change intracellular signalling, gene expression, the release of pro-inflammatory chemicals, and the production of free radicals by interacting with plasma membrane localised receptors (RAGE, receptors for AGE) and it creates intra- and extracellular cross-links with lipids, nucleic acids, and other endogenous important molecules in addition to proteins.
- The long term effect of diabetes is associated with CVD, kidney failure, diabetic retinopathy, neurological disorders including rheumatoid arthritis, osteoporosis, ageing, all are linked to AGEs.

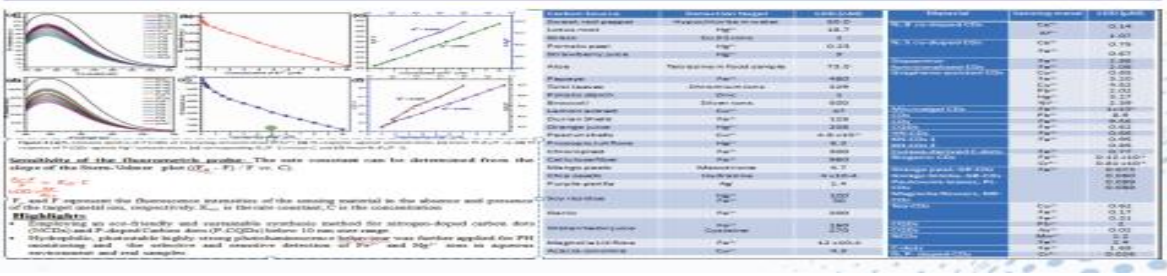
DETECTION OF ADVANCED GLYCATION ENDPRODUCTS

- Heterogeneity and limited information made Advanced Glycation Endproducts detection difficult.
- High-end instrument and experts are required to detect Advanced Glycation Endproducts.
- Our aim is to develop metal nanoparticle based colorimetric sensor for detection of Advanced Glycation Endproducts which is user friendly, easy to identify by naked eye and inexpensive.

CARBON QUANTUM DOTS BASED FLUOROMETRIC SENSOR FOR HEAVY METAL IONS - AN APPROACH FOR SUSTAINABLE ENVIRONMENTAL AND WATER





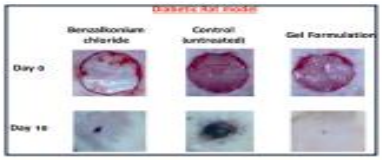


NANOTECHNOLOGY'S "NANO-MARVELS: TRANSFORMING HUMAN HEALTH AND WELLNESS"

nanoBreath – N95 PM 2.5 Antimicrobial Face Mask

Scientifically validated eliminating more than 99.99% of pathogens
FDA registered material and EU Compliant

"Nano Breath N95: Breath clean, Breath safe- Your shield against the unseen"



SMART-SKIN CONSTRUCT

A first of its kind, indigenous and cost-effective, bio-synthetic, silica enriched, smart skin construct has been developed for scar-free burn wound healing.
Further studies to establish its efficacy as underway.
A patent has also been filed for the same.
The project is funded by ICMR (File no. 17X(3)/Adhoc/87/2022-ITR.

Rejuvenation of Bilaspur Pond

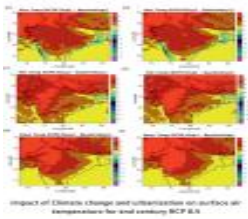
A high societal project to rejuvenate a waste- water pond at nearby village named Bilaspur in Haryana.
Firstly, the cleaning of pond was done with 100 KLD MBBR (Moving bed biofilm reactor) technique along with Ferrite based nanoparticles as heavy metal adsorbents.
Project aimed to enhance the ecosystem of the area.

AMITY SCHOOL OF APPLIED SCIENCES: DST-SERB SPONSORED PROJECTS

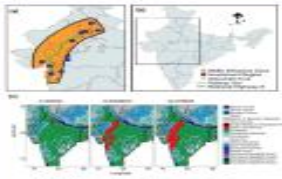
Development of high - resolution future climate scenarios for the NCR region under climate change and urbanization - PI: Dr Sarika Jain

- Recent decades have seen NCR's expansion, encouraging increased urbanization and industrial activity.
- NCR faces a dual challenge as climate change. Global studies indicate that LULC changes influence regional temperatures, impacting both maximum and minimum values.

	Year
Base Line	1996-2005 (Historic)
Mid century	RCP4.5(2050-59)
Mid Century	RCP8.5(2050-59)
End Century	RCP4.5(2090-99)
End Century	RCP8.5(2090-99)



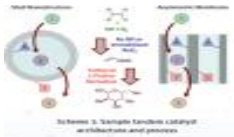
- Study the impact of urbanization on Delhi NCR.
- Study the impact of climate change for future scenarios (RCP 4.5, RCP 6.0 and RCP 8.5) considering all seasons.
- Study the combined impact of urbanization and climate change.



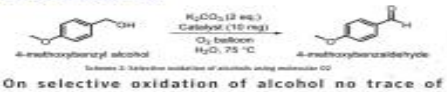
- The minimum temperature shows an increase of 4°C to 7 ° C with a maximum warming of 7.1 ° C at the end of the century for the extreme urbanization case under the RCP8.5 climate scenario.
- The maximum temperatures also show an increase in the 1.5 ° C to 3.5 ° C range.
- The increase in temperature is due to decrease in latent heat and increase in sensible heat flux..

References: Modeling Earth Systems and Environment, 7: 1309-1319. ISSN No: 2363-6211.
- The International Journal of Climate Change: Impacts and Responses, 13(2): 39-60.

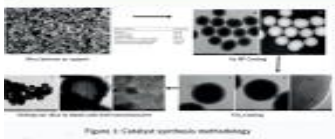
Novel nanostructures for selective multistep catalysis - PI: Dr Anirban Das



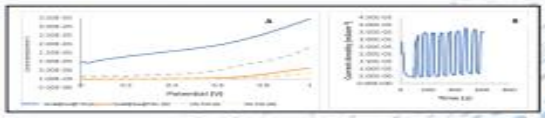
- Architectures with multiple catalysts on single support may lead to greener catalytic processes (e.g. Scheme 1)
- Need to purify intermediates would be eliminated.
- We report nano-architectures having hollow titania shells enclosing sub 2 nm Au nanoparticles.



On selective oxidation of alcohol no trace of corresponding carboxylic acid observed, indicating a controlled oxidative pathway (Scheme 2).



- SiO_2 nanospheres templates synthesized & functionalized with presynthesized Au NPs.
- TiO_2 coating followed by etching out SiO_2 core lead to Void@Au@TiO_2 architectures (Figure 1).



- Photoelectrocatalytic studies indicated stable photo-response (Figure 2).
- The developed architectures would be evaluated for tandem catalysis reactions after tethering an additional catalyst.

Reference: Journal of Solid State Chemistry, 2024, 330, 124484.
Acknowledgement: DST-SERB Grant: TAR/2020/000289

AMITY UNIVERSITY

A RESEARCH & INNOVATION DRIVEN UNIVERSITY **GRADE A+ ACCREDITED BY NAAC**

ANALYSIS OF PHOTOSYNTHETICALLY ACTIVE SOLAR RADIATION FOR AGRI-VOLTAIC PLANT

INTRODUCTION

Agri-voltaic is defined as the dual use of the same land area for solar electricity and plant cultivation including aquaculture.

There are three different layouts of the AVPs (Pulipaka et al. 2021):

- Interspace farming wherein crops are grown in the space between two rows of solar arrays.
- Farming below the panels which are installed with a tilt angle equal to the latitude and no special arrangement is made for growing crops underneath these panels. Manual cultivation is only possible under these panels.
- Farming below elevated structures which are around 3m high (Casares de la Torre et. al. 2022).

Photosynthetically Active Radiation (PAR)

Plants use solar radiation in the wavelength of 400-700 nm for photosynthesis – photosynthetically active radiation (PAR). Quantum sensors are utilised for measuring PAR at any site.

Availability of solar radiation underneath the solar panels is a major challenge while growing crops in agri-voltaic plant.

Mathematical relations were derived to calculate the fraction of light that reach the ground under the collector field when collectors are mounted 2m above the ground with row spacing equal to three times the height of the collectors (Goetzberger et al. 1982).

But it is difficult to have a ground measured PAR data for all sites which can be utilized for decision making for the selection of plants that can be grown in the given site.

Objective is to develop a model to estimate the photosynthetically active radiation (PAR) under an agrivoltaic plant at AUH.

AGRI-VOLTAIC PLANT AT AMITY UNIVERSITY HARYANA

Agri voltaic plant under an 185kWp conventional grid connected solar photovoltaic power plant which is in Amity University Haryana which is surrounded by the Aravalli Mountain range from one side.

Fifteen different variety of plants were grown to study the impact of radiation on the plant's growth and identify the plants which grow best under the given radiation conditions. Solar radiation availability were also studied underneath the panels.

CONCLUSIONS

- The proposed model can be utilized to estimate the photosynthetically active solar radiation under a solar photovoltaic power plant for any location.
- The model is simple and utilizes only the location, date and time of the day for computing the PAR values.
- The model can be utilized to estimate PAR at a given location and can be utilized to select the variety of plant that can be grown under the solar PV power plant.

MODEL TO ESTIMATE PHOTOSYNTHETICALLY ACTIVE RADIATION

The monthly average hourly PAR on a horizontal surface (PAR_H) can be calculated using the following relation:

$$PAR_{H,i} = 0.389f \times I_{oi} \; ; i = 1, 2 \qquad (1)$$

Where

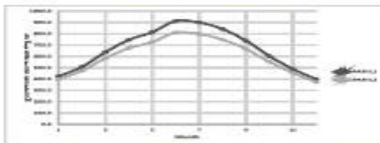
[illegible] (2)

[illegible] (3)

[illegible]

For altitude up to 300 m	January, February, December	March, April, May	June, July, August	September, October, November
a	0.18	0.21	0.25	0.25
b	0.51	0.49	0.51	0.51

RESULT AND DISCUSSIONS



It is observed that mean $PAR_{H,1}$ = [illegible] kJ/m²h, having a range of [illegible] kJ/m²h for the entire year using eq (2).

- Mean $PAR_{H,2}$ = [illegible] kJ/m²h having a range of [illegible] kJ/m²h for the entire year using eq (3).
- There is a [illegible] difference in the value of PAR_H computed using eq. (2 & 3).

VALIDATION

Comparison of results for peak value of PAR, using Proposed model with measured values reported by Ghayas et al. 2022

[illegible]

REFERENCES

Casares de la Torre F.J., Varo M., Lopez-Luque R., Ramirez-Faza J., Fernández-Ahumada L.M. (2022). Design and analysis of a tracking / backtracking strategy for PV plants with horizontal trackers after their conversion to agrivoltaic plants. Renewable Energy 187, 537-550.

Ghayas H., Radhakrishnan S.R, Sehgal V. K. et.al (2022). Measurement and comparison of photosynthetically active radiation by different methods at Delhi. Theoretical and Applied Climatology, 150 (3-4):1-13.

AMISOLAR-LIFETIME AND DIFFUSION LENGTH MEASUREMENT UNIT

FOR MINORITY CHARGE CARRIERS IN SILICON SOLAR CELLS AND WAFERS

Amisolar is an instrument/system which can measure the Lifetime and Diffusion Length for minority charge carriers in Silicon Solar Cells.

Amisolar can be utilized from any size and shape of solar cells to the latest technology of solar cells with 8" wafer size. Amisolar can build a positive benchmark for all the PV industries and even the electronic component fabricating industries. It will provide a cost-effective solar cell testing tool, which is the most required instrument in all the solar cell manufacturing industries. This too supports researchers and scientists, working in academic or other laboratory organizations.

Technically, when sunlight/photons are falling on solar cell, it produces electron and hole pairs, which should be well collected before they recombine. Therefore, we must measure how much an average time they can take without recombining. More the average time, better will be the collection rate, which will give more output power and so the better efficiency of the cell. One has to measure many times in the fabrication process line of the solar cells; thus, such equipment will be required by all solar cell manufacturing industries.

In academics too, at university, institutes or R&D labs every time the efforts were made to measure this factor, whenever, we are doing any changes in the material or change in design of solar cells or adding some more materials to modify the base or top surface of the solar cells. All research scholars working in the field of solar cell technology need this equipment at R&D labs or universities.

The present equipment has been developed with great efforts by the team including Dr. Abhishek Verma, Dr. Devinder Madhwal, Dr. Vivek Kumar and a few others, under the leadership of Prof. V. K. Jain. The basis of the equipment is completely based on Dr. V. K. Jain's own theory, which was published long back in 1987, in a top journal of USA, when he was in DRDO. Now this equipment is designed and developed as a commercial model at Amity University, Noida, under an important project with financial support provided by DST, Govt. of India, with the Industrial support from M/s Glorisa Technovation India Pvt. Ltd.

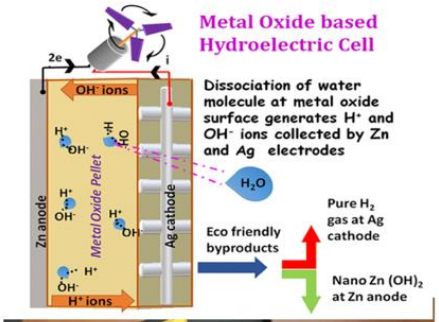
ACKNOWLEDGMENTS:

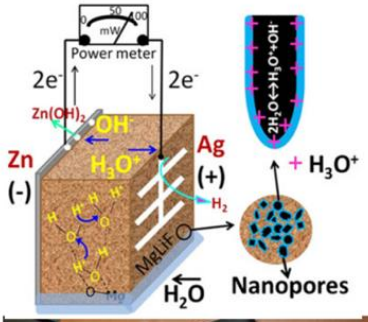
We wish to express our gratitude to the Founder President of Amity University, Dr. Ashok K. Chauhan for his encouragement and guidance and Department of Science and Technology for the financial support.

Hydroelectric cell

Amity Centre of Nanotechnology

AMITY UNIVERSITY GURUGRAM





Sensing electrodes

Amity Centre of Nanotechnology

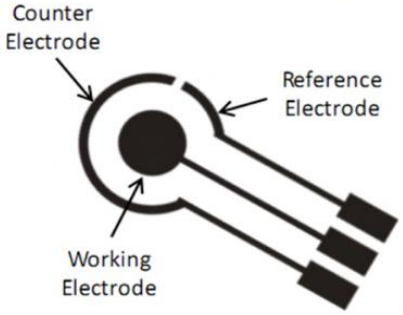
AMITY UNIVERSITY GURUGRAM

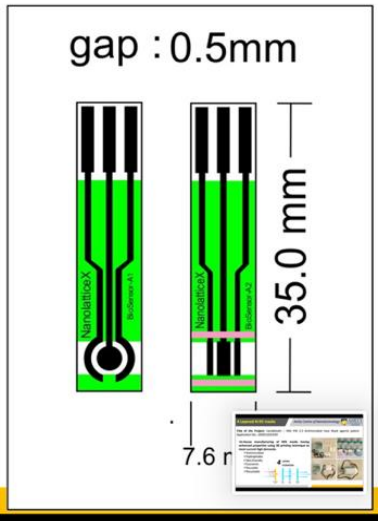
Benefits to the Society

Electrochemical devices having the advantages of low price, miniaturization, and obtaining real-time data using graphene nanoparticles with the different base substrates, fr4, and mylar.

Advantages

- Impedance
- Biosensor applications
- I-V curve
- Adulterations
- Electrochemical properties





Hydrogen gas sensor

Amity Centre of Nanotechnology

AMITY UNIVERSITY GURUGRAM

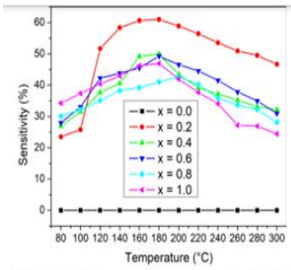


Fig. 5. Sensitivity (%) the sensors with the temperature range from 80 to 300 °C at 1000 ppm of H_2concentration.

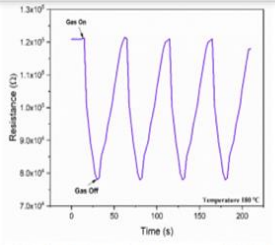


Fig. 7. The change in resistance with time at a temperature of 180 °C in the presence of 1000 ppm hydrogen gas.

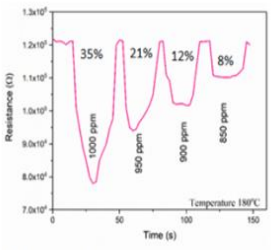


Fig. 6. The response of the sensor with tungsten (x = 0.2) at an optimum temperature of 180 °C for a concentration 850, 900, 950 and 1000 ppm of hydrogen gas.

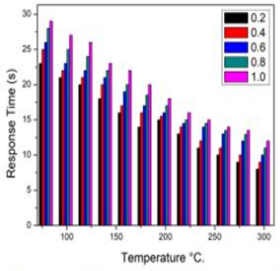


Fig. 8. The response time for all sensors at temperature range from 80 to 300 °C in a step of 20 °C.

Contents lists available at ScienceDirect

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journal homepage: www.elsevier.com/locate/rinp

Development of tungsten doped Ni-Zn nano-ferrites with fast response and recovery time for hydrogen gas sensing application

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Office of the Controller General of Patents, Designs & Trade Marks
Department of Industrial Policy & Promotion,
Ministry of Commerce & Industry,
Government of India

INTELLECTUAL PROPERTY INDIA

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APPLICATION TYPE	ORDINARY APPLICATION
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APPLICANT NAME	AMITY UNIVERSITY
TITLE OF INVENTION	HIGH RESPONSE AT LOW POWER TUNGSTEN DOPED NI-ZN FERRITES RESISTIVE SENSOR FOR HYDROGEN GAS
FIELD OF INVENTION	PHYSICS
E-MAIL (As Per Record)	
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Agricultural applications

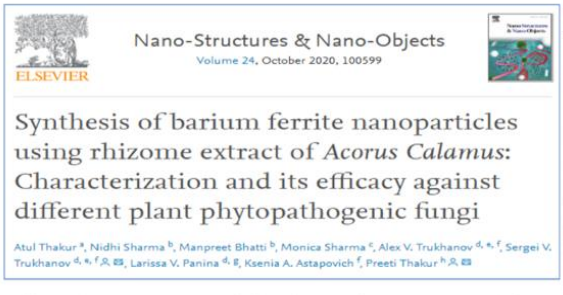
Amity Centre of Nanotechnology

AMITY UNIVERSITY GURUGRAM

FULL PAPER
Nanoferrite-Fungicide

Global Challenges
www.global-challenges.com

Nanomaterial Fungicides: In Vitro and In Vivo Antimycotic Activity of Cobalt and Nickel Nanoferrites on Phytopathogenic Fungi



Nano-Structures & Nano-Objects
Volume 24, October 2020, 100599

Synthesis of barium ferrite nanoparticles using rhizome extract of *Acorus Calamus*: Characterization and its efficacy against different plant phytopathogenic fungi

Atul Thakur [a], Nidhi Sharma [b], Manpreet Bhatti [b], Monica Sharma [c], Alex V. Trukhanov [d, e, f], Sergei V. Trukhanov [d, e, f], Larissa V. Panina [d, g], Ksenia A. Astapovich [f], Preeti Thakur [b]

Effect of (a) $CoFe_2O_4$ and (b) $NiFe_2O_4$ ferrite nanoparticles against *Fusarium* wilt of capsicum under pot culture conditions compared to (c) control.

HYDROGEN GENERATION TECHNOLOGY WITH AI SUPPORTED SOLAR PHOTOVOLTAIC SYSTEM FOR GREEN ENERGY

MOTIVATION:

Demand of clean and green energy and ubiquitous access to electricity are the key factors which can be anticipated as constraints of economic development and human growth prospects.

The need for energy conservation, especially electricity, is of crucial importance as it is an economic solution to the problem of energy shortage and atmospheric carbon reduction.

The role of Arti cial intelligence (AI) has also been displayed by researchers in the promotion of energy management. Most of the past literature in the line of energy management strategies proposed various energy management models based on smart grid and smart meter technology, demand side management, home energy management schemes and management based on AI.

CONCLUSION & EXPECTED OUTCOMES:

Amity University Haryana has vast research infrastructure and has already installed 500 kW solar power plant in the campus for ful lling its daily energy requirements.

The proposed system is portable, compact and highly ef cient for ful lling the energy requirements of remote rural areas and transportation, therefore, is bene cial for improving the life standard of society in innovative manner.

The storage of hydrogen fuel is a big challenge which can be addressed by maintaining cryogenic environment for its storage and transportation.

With the availability of resources and competent faculty, this project can be made successful to the expectations of SECI/ Govt. of India.

The proposed system is able to commission an ef cient & clean hydrogen generation technology with the help of AI supported SPV system.

AIMS AND OBJECTIVES:

Ef cient and clean hydrogen generation by electrolysis with SPV power systems to achieve sustainable energy demand.

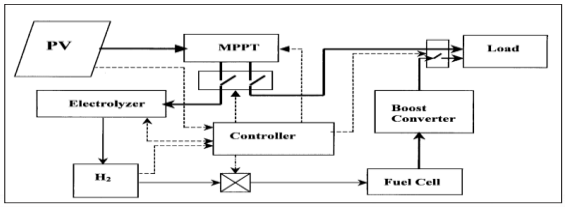
Solar energy forecasting and ef cient capturing of Solar Irradiance with Arti cial Intelligence Techniques.

Optimizing Operational System Cost

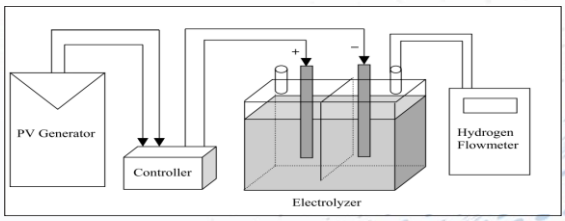
Eliminating RE Barriers and Strengthening Energy Security

Arti cial Intelligence based energy management and sustainable growth management

To procure a compact, portable and highly ef cient hydrogen generation system for remote and rural areas in view of improving the life standard of society in innovative manner



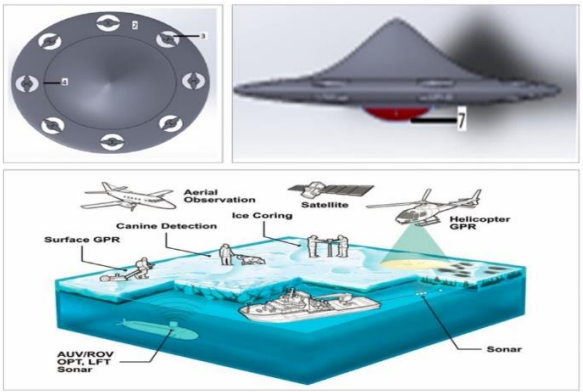
(a)



(b)

Fig. 1 (a) Line diagram of the project and, (b) Electrolysis Process

HAPS FOR SURVEILLANCE & NAVIGATION



High-Altitude Pseudo-Satellite for Agricultural, Military & Other Surveillance & Navigation Applications

The proposed project is a carbon-free cost-effective solution in which the satellite will not be projected to LEO but the Nano Satellite (inbuilt with SAR) would be attached **to High altitude pseudo satellite platform** at the height of 25 to 30 km from the sea level. This is a **hybrid system where solar energy** will be trapped by thin film lightweight high-efficiency solar cells that are placed on the upper area of the dome where inside the dome a **helium balloon** will be placed, the purpose is to reduce the overall weight of the HAPS system. Here are some other unique features of using HAPS for surveillance & navigation applications:

- **Continuous Power Generation**
- **Greater Efficiency**
- **Reduced Maintenance**
- **Easy Deployment**
- **Reduced Carbon**

AMITY UNIVERSITY MADHYA PRADESH

FOLDABLE WASHING MACHINE

BRIEF ABOUT YOUR TECHNOLOGY:

- The project comprises of a flexible drum whose height can be adjusted as per the requirement, thus obtaining the name "Foldable Washing Machine.
- The design is highly compact promising an optimum space utilization

UNIQUE FEATURES OF THE TECHNOLOGY:

- Since the height of the drum is adjustable.
- it can be easily moved from one place to another.

PROBLEM IT IS ADDRESSING.

- It is a foldable device with an effective cleaning potential.
- Due to compact size, it has less water consumption

RESULTS/SCIENTIFIC DATA IF ANY:

REGENERATIVE BRAKING SYSTEM

BRIEF ABOUT YOUR TECHNOLOGY:

- The project utilizes the conversion of Kinetic energy of the rotating wheels into electrical energy. which could otherwise have been converted into heat due to action of the brake.

UNIQUE FEATURES OF THE TECHNOLOGY:

- The energy kinetic energy getting converted into heat dissipated during braking action is very high
- Generally lost into the surroundings with no further utilization.
- The device utilizes a major portion of such kinetic energy to convert into electrical energy
- It may be used in lighting system of the vehicle.

PROBLEM IT IS ADDRESSING:

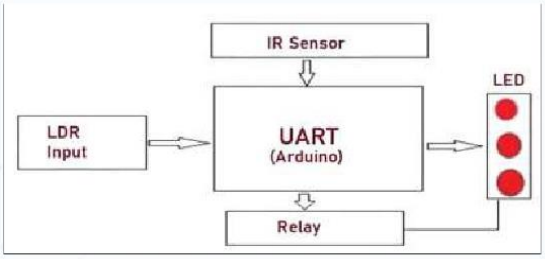
- The negligible heat dissipation leads to higher fuel efficiency
- Lower maintenance of the vehicles
- Improving the overall vehicle economy.

RESULTS/SCIENTIFIC DATA IF ANY:

SMART CONTROL OF STREET LIGHT USING SOLAR PANEL

BRIEF ABOUT TECHNOLOGY:

- Smart street light system is to reduce energy consumption, optimize maintenance, on public roads.
- It integrates advanced technologies such a sensors, wireless communication, and intelligent control systems.
- Sensor Deployment: Smart street light systems use sensors to detect the presence of vehicles and pedestrians. The sensors are installed at strategic locations along the street to provide the required coverage.
- Data Collection: The sensors collect data on vehicle and pedestrian traffic, as well as ambient lighting conditions. The data is then transmitted to a central controller for processing.
- Sensor unit: It consists of the motion sensor, the communication device and the controller. It sends out the message to other units under the condition that motion is detected.



UNIQUE FEATURE OF THE TECHNOLOGY:

- Automatically switches ON lights when the sunlight goes below the visible region of our eyes.
- Detect movement that enables dynamic lighting and dimming.
- It is more energy efficient as compared to normal systems.

PROBLEM IT IS ADDRESSING

- Large amount of electric energy is consumed by the street lamps, which are automatically turned on when it becomes dark and automatically turned off when it becomes bright.
- The street light system in this project turns on the lights with full intensity when they are needed.
- By reducing energy consumption, the system can help to save costs associated with energy bills and maintenance

RESULTS/SCIENTIFIC DATA IF ANY:

TERRABIN

BRIEF ABOUT YOUR TECHNOLOGY:

- Terrabin is a machine by which we can produce organic manure.
- It converts the raw organic waste into small particle by mechanical churning.
- Molecular degradation of the waste by bacterial consortium and enzymes.

UNIQUE FEATURES OF THE TECHNOLOGY:

- Easy to install.
- Microbes mediated faster degradation.
- Quality control of organic manure is possible.
- Simple and economic setup.
- Decrease the agriculture input cost.
- Solar operated.

PROBLEM IT IS ADDRESSING:

- It will provide farmers a solution by which they can produce their own nutrient rich manure in very low cost with limited resources and skills.
- Producing organic manure using our product Terrabin is a solution to overcome the economic burden of chemical fertilizers in farming.
- By this process the organic waste will be converted into nutrient rich organic manure in 5 to days.

RESULTS/SCIENTIFIC DATA IF ANY:

EYE BLINK ANTI SLEEP ALARM SYSTEM

BRIEF ABOUT TECHNOLOGY

- Eye Blink Anti Sleep Alarm system is basically used to track the driver's eye movements using Eyeblink Sensor.
- If the driver is feeling drowsy, then the system will trigger a warning message using a loud buzzer alert and simultaneously switch off the motor of the vehicle to avoid accidents.

UNIQUE FEATURES OF THE TECHNOLOGY

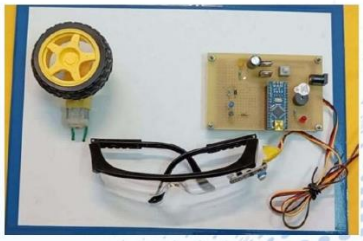
- Eye blink systems can be in variety of applications where the attention needs to be monitored.
- It can be used while driving, so that an alarm or a notification can be sent if the driver eye is closed for more than two seconds.
- Other applications are, scientific studies to measure fatigue or can be used for research purposes to count number of eyeblinks.

PROBLEM IT IS ADDRESSING:

- The goal of this project is to develop a system that can accurately detect sleepy driving and make alarms accordingly,
- It aims to prevent the drivers from drowsy driving and create a safer driving environment.

RESULTS/SCIENTIFIC DATA:

- Hence, eye blink sensors are a revolutionary technology that has the potential to transform various fields such as medicine, gaming, and even everyday life.



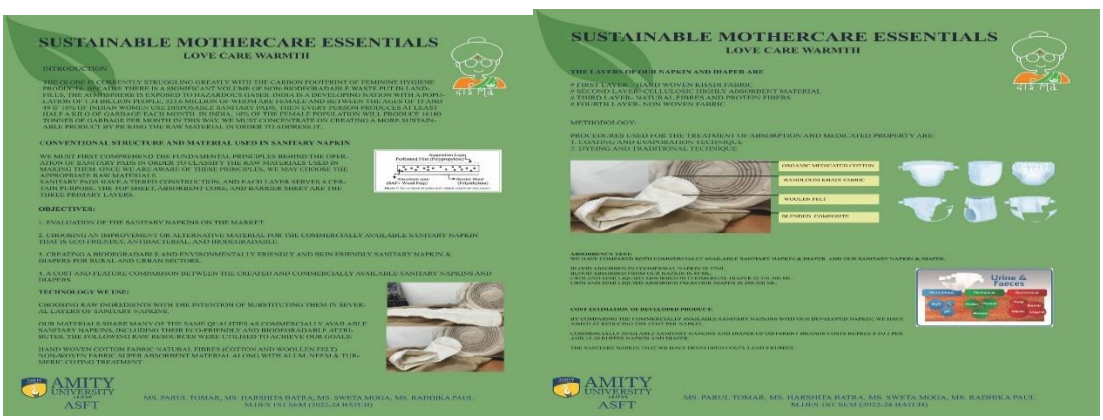
AMITY UNIVERSITY RAJASTHAN

- **Inner Cosmos**

In a bustling world where the cacophony of daily life often drowns out the whispers of our inner selves, there exists a serene refuge known as the Inner Cosmos. Far more than just a café, it is a visionary haven, meticulously designed to provide essential mental health services while nurturing awareness of their significance in our daily lives. Students of Amity Institute of Behavioural and Allied Sciences introduce a unique café name as "Inner Cosmos".At the heart of Inner Cosmos lies a profound ethos that recognizes the universality of mental health challenges. Unlike many establishments, Inner Cosmos places no age limits on its patrons. The philosophy behind this inclusivity is simple yet profound: mental health issues and disorders do not discriminate. It offers self-healing techniques and mental health services that cater to the unique needs of every individual.

- **Sustainable Mothercare Essentials - Love Care Warmth**

Sustainable diapers for old age people and kids - Development of sustainable and homemade diapers for old age people and kids and distribution to nearby villages.



- **pKiosk: Introducing the future of document printing** - our self-service kiosk delivers a seamless, convenient, and affordable printing experience that meets all your needs. Our self-service printing kiosk provides a convenient, affordable, and efficient solution to the challenges of traditional document printing, while our vision is to revolutionize the printing industry with cutting-edge technology and unparalleled customer experience.

PROBLEM

The traditional method of document printing in universities can be Time – Consuming, Inconvenient and Long Waiting times.

In addition, it can be difficult for students and faculty to access the printing resources they need, especially outside of regular business hours.

SOLUTION

Say goodbye to long queues, inconvenient locations, and frustrating printing experiences - discover the solution to your document printing problems with our innovative self-service kiosk.

Upload docs from phone or computer, scan code or enter key, preview, and print in seconds with pKiosk. Quick Printouts, No Waiting Time, 24/7 Ready to Print, Low Printing Cost, Easy File Transfer, Easy Payments.

RESOURCES USED Hardware- Iron Body**,** Printer**,** Raspberry Pi**,** Arduino**,** Fans**,** Wires**,** Paper Ejecting Rollers**,** Stepper Motor**,** Power Supply**,** Inverter**,** Battery**,** Power Resource**. Software-** HTML**,** CSS**,** JavaScript**,** MySQL**,** Python**,** Flutter.

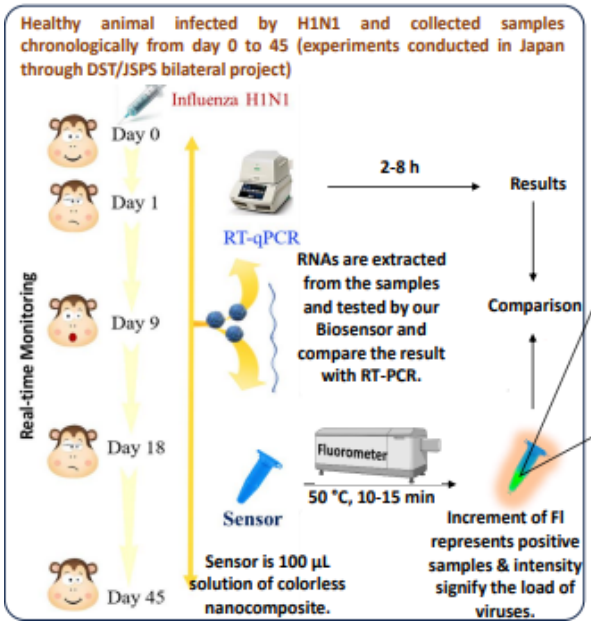


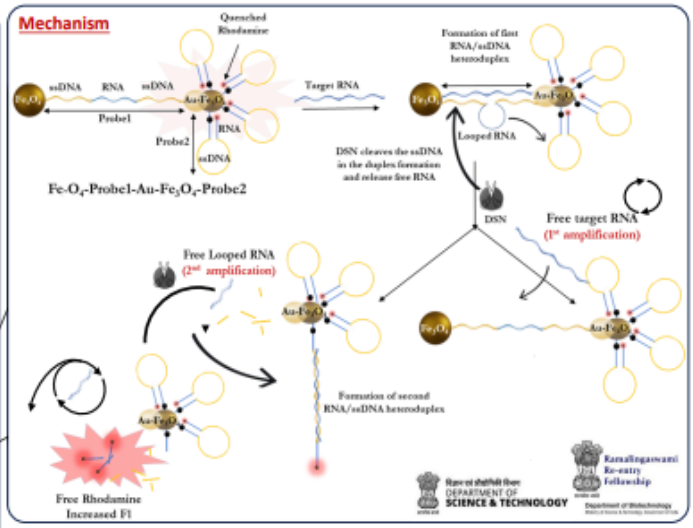
AMITY UNIVERSITY WEST BENGAL

AMITY UNIVERSITY KOLKATA

Direct detection of RNA by bi-functional nanocomposite using DSN assisted double cyclic amplification

Dr. Ankan Dutta Chowdhury, Associate Professor & RLS fellow, Amity Institute of Nanotechnology Kolkata





Novelty: To achieve an alternative method of RT-PCR, a nanoprobe has been designed in such way that a single target RNA can trigger two cyclic amplification processes simultaneously for multiplying the detection fluorescence signals.

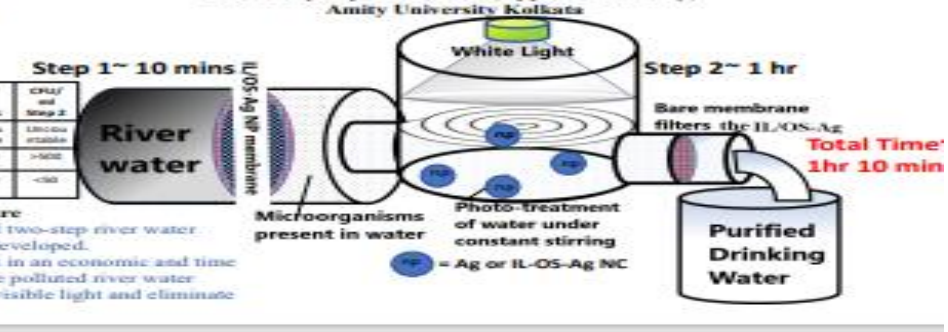
AMITY UNIVERSITY KOLKATA

Visible Light-Driven Water Purification System With Enhanced Antimicrobial Activity Using OS-Ag Nanocomposite

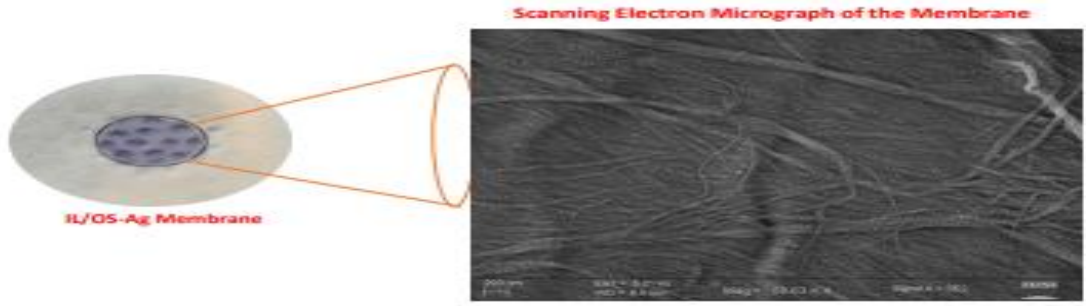
Dr. Susmita Das, Associate Professor Department of Chemistry
Dr. Kajari Datta, Associate Professor Department of Physics
Mr Soumyadip Nandi, MSc (Applied Chemistry)
Amity University Kolkata

Issues
Affordable and lesser time-consuming membrane filtration technique to a remediate polluted water

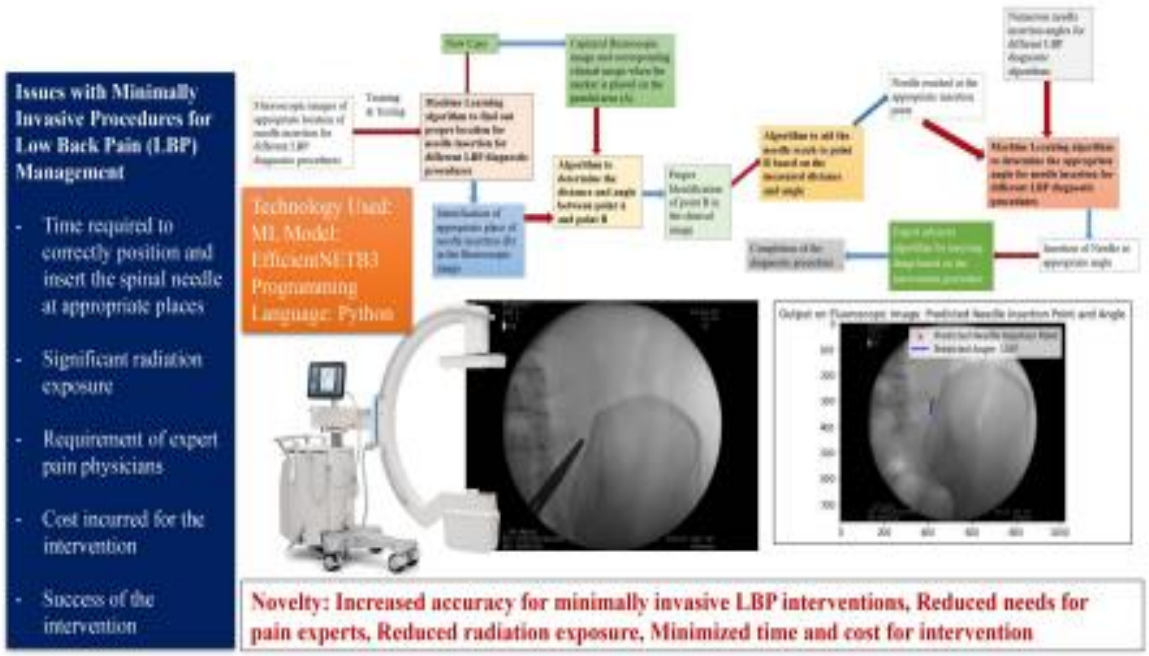
Filter Type	TDS (ppm) After Step 1	CFU/ml Step 1	CFU/ml Step 2
Bare Filter	1900	Uncountable	Uncountable
Ag NP Filter	600	>500	>500
IL/OS-Ag NP Filter	225	>500	<50

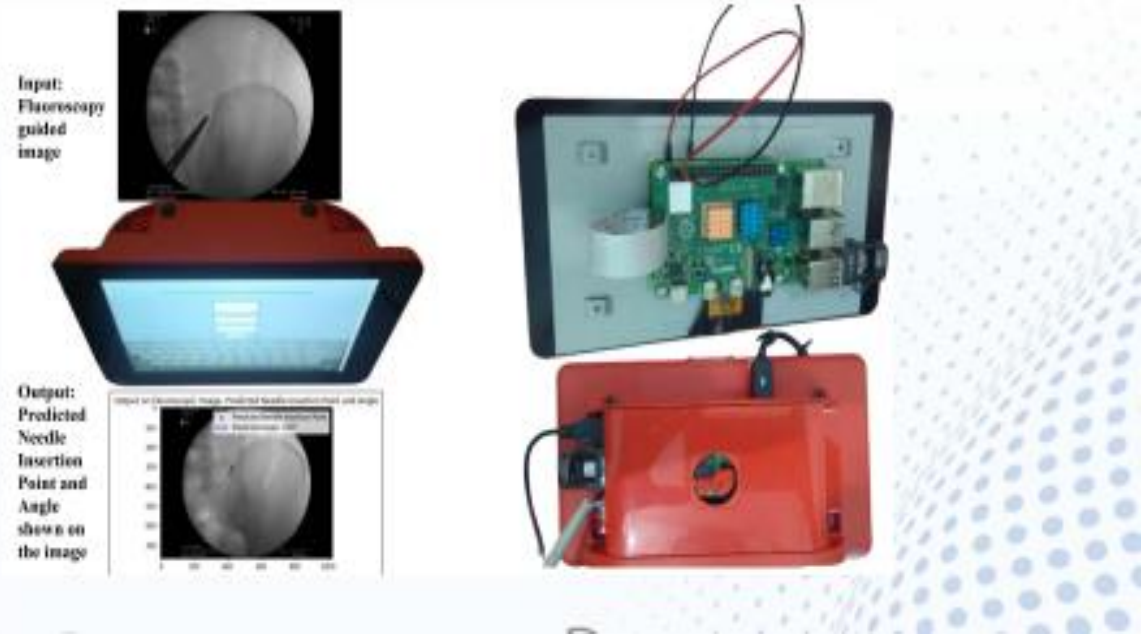


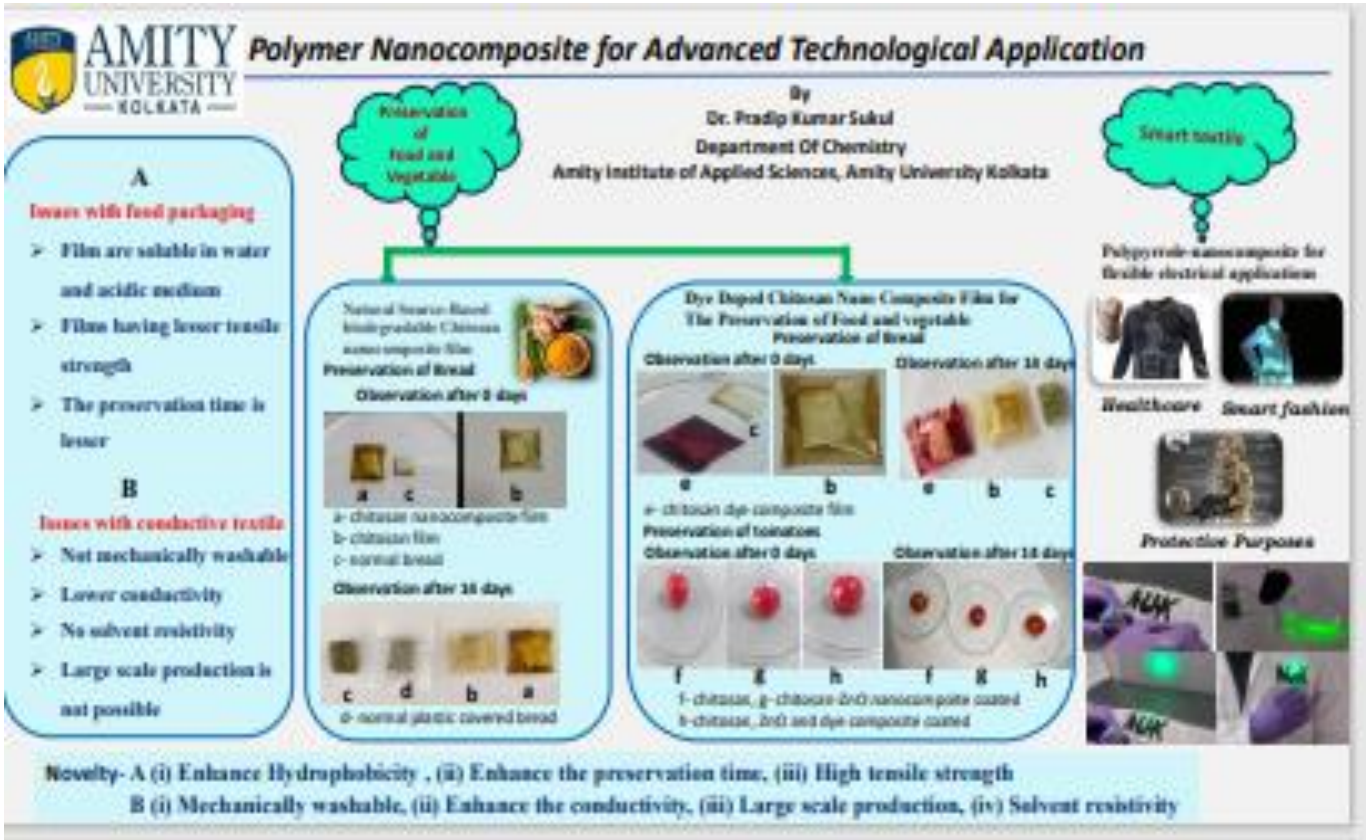
Outcome and Unique Feature
- A novel visible light aided two-step river water purification technique is developed.
- The technology will result in an economic and time saving approach to recycle polluted river water using naturally abundant visible light and eliminate use of UV light

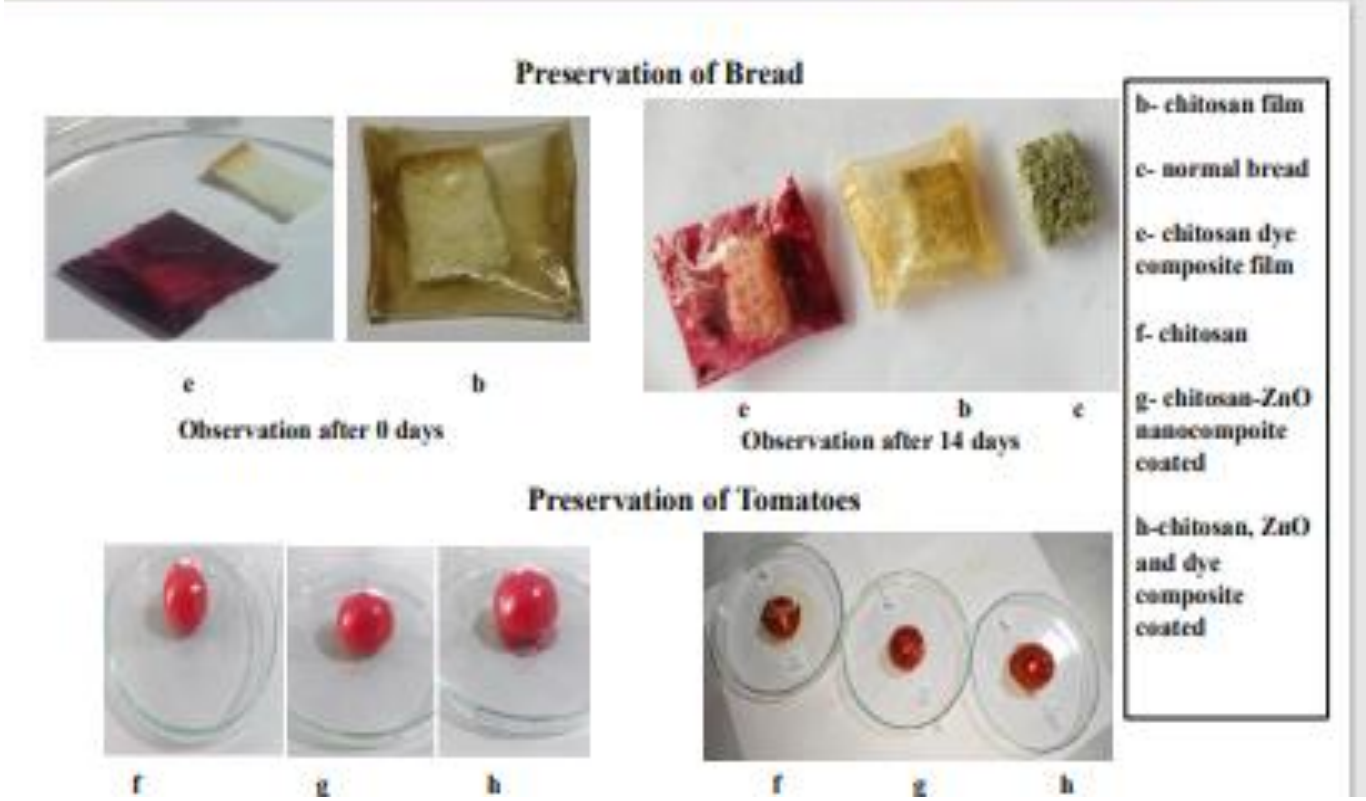


MACHINE LEARNING TECHNIQUES FOR AIDING IN FLUOROSCOPY-GUIDED MINIMALLY INVASIVE INTERVENTIONAL LOW BACK PAIN MANAGEMENT PROCEDURES






AMITY UNIVERSITY KOLKATA
Polymer Nanocomposite for Advanced Technological Application
By
Dr. Pradip Kumar Sukul
Department Of Chemistry
Amity Institute of Applied Sciences, Amity University Kolkata
A
Issues with food packaging
Film are soluble in water and acidic medium
Films having lesser tensile strength
The preservation time is lesser
B
Issues with conductive textile
Not mechanically washable
Lower conductivity
No solvent resistivity
Large scale production is not possible
Preservation of Food and Vegetables
Smart textile
Polypyrrole-nanocomposite for flexible electrical application
Healthcare
Smart fashion
Protective Purposes
Preservation of Bread
Observation after 0 days
Observation after 16 days
Dye Doped Chitosan Nano Composite Film for The Preservation of Food and vegetable
Preservation of Bread
Observation after 0 days
Observation after 16 days
Preservation of tomatoes
Observation after 0 days
Observation after 14 days
Novelty- A (i) Enhance Hydrophobicity , (ii) Enhance the preservation time, (iii) High tensile strength
B (i) Mechanically washable, (ii) Enhance the conductivity, (iii) Large scale production, (iv) Solvent resistivity


Preservation of Bread
e
b
Observation after 0 days
e
b
c
Observation after 14 days
Preservation of Tomatoes
f
g
h
f
g
h
b- chitosan film
c- normal bread
e- chitosan dye composite film
f- chitosan
g- chitosan-ZnO nanocompoite coated
h-chitosan, ZnO and dye composite coated

AMITY UNIVERSITY PUNJAB

- **Application of Integrated Personal Omics Profiling in Treatment of Urolithiasis using Homeopathic Approaches**

✓ **Objectives:**

a) Screening and efficacy of select homeopathic medicines on calcium oxalate monohydrate (COM) nanocrystal-induced injury to renal cell lines. To delineate responsible pathways and possible mechanisms acquired by the homeopathic medicines in Urolithiasis.

b) NGS based differential transcriptomic profiling: Basic research- COM injured cells exposed to homeopathic medicines. Clinical research -Blood samples of patients treated with homoeopathic medicines.

c) LC- MS/MS based differential proteome profiling: Basic research - COM injured renal cell lines exposed to homeopathic medicines. Clinical research - Blood samples of patients treated with homoeopathic medicines. To correlate changes in the expression level of various genes at the RNA and protein levels in patient and cell lines in response to homeopathic medicines to devise a connectivity map for Kidney stone disease

d) To generate an integrative Personal Omics Profile and examine several biological components in context of various personality types

- **Expected Outcome**

➢ Identify genes and networks that respond to antilithiatic Homeopathic medicine

➢ Integration of Omics dataset shall provide scientific basis of selecting Homeopathic medicine

➢ Building of database of omics, diagnostics, and clinical findings of Indian patients in conformation with Homeopathic principles

➢ Provide scientific basis to homeopathic treatment

Translational Value

This will be the first study in the area of Kidney stones which will integrate cutting edge omics technologies, machine learning and homeopathic clinical information. It is expected to generate significant translational value in terms of development of new scientific framework for the treatment of kidney stones using homeopathy and modern scientific techniques.

AMITY UNIVERSITY MAHARASTRA

- **Design, Fabrication and Performance Evaluation of 6 DoF Robotic Arm**

The main purpose of building this robotic arm was to create an easy to replicate design for other students to make and modify. The 6 DOF robotic arm was made using off the shelf servo motors, a combination of laser cutting 3mm MDF and 3D printing PLA. The software for controlling the robot runs on an ESP32 Wi-Fi and Bluetooth enabled microcontroller which is powered by a 12v wall adapter. The controller is a custom made app made using MIT APP INVENTOR.

The study and research for the project included researching different types of robots, history, and various control schemes. These control schemes and designs inspired the design of the robotic arm. What makes this different from the other available designs is the extreme modularity that is provided by the laser cut design. Each item is panelized and hence can be modified or replaced as needed according to requirements. The control for each motor also uses standard PWM signals and the actuators can also be replaced. The tool also as a result is very versatile and can be replaced according to needs like drilling, cutting, welding etc.

In the current design, configuration and parts used, the arm has a maximum load capacity of 200 gm when fully extended. The cost of the entire project was also minimized and kept under ₹10,000.

- **Microalgae cultivation facility:** Innovative approach of integrating wastewater treatment and microalgae cultivation

Microalgae are considered as promising feedstock for biofuels production; however, the cultivation is still unfeasible due to input cost of chemical nutrients and fresh water requirement. Wastewater is comprised of nutrients such as ammonia, nitrates, phosphates, organic carbon etc. which can support microalgal growth. Use of wastewater can improve the economics of microalgae cultivation and reduce the fresh water footprint of the process. During cultivation microalgae also sequester CO2 for photosynthesis process. The biomass generated can be used for production of biofuels, biofertilizer and various bioproducts.

AMITY UNIVERSITY CHHATISGARH

- **Next-GEN Wound Dressings -Biocompatible, Biodegradable and Sustainable Gauze**

The conventional Cotton Wound Dressing Gauze creates huge Biomedical Waste and Contagion Issues with increased Environmental Load. To counter this, we plan to Innovate the Next GEN biocompatible, biodegradable, and sustainable wound dressing gauze from the cellulosic biomass derived from the agricultural waste. The project has led to the development of research collaboration with Dr. Anuj Kumar (Ramalinga swami Fellow and Assistant Professor) Department of Material Science, IIT BHU Varanasi for the material characterization and successful completion of the project. The outcome would be the Development of Wound dressing gauze with Cost effective (Source of Raw material, Agro-waste Cellulose

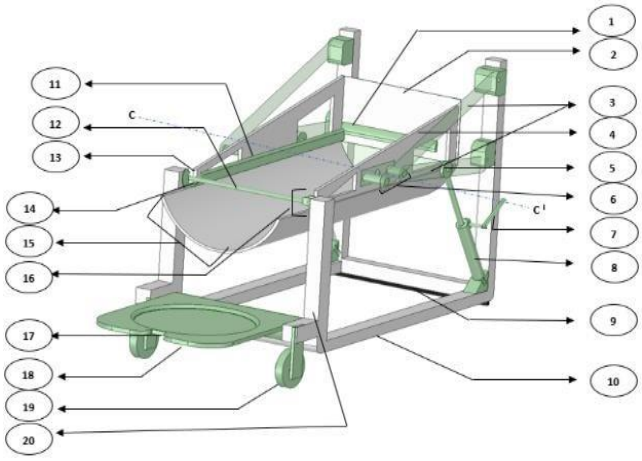
Biomass) Persistent with 3 of sustainability (Reduce, Reuse, Recycle). Micro/Nanofiber based material with higher surface area and adhesion properties. High Biocompatibility Biodegradability Sustainability with at-par efficiency to the currently available conventional gauze.

Future benefits to the society: 3 R's of sustainability (Reduce - Reuse - Recycle) - Cost effective (Source of Raw material, Agro-waste Cellulose Biomass) - Applicability - Public/Community Health Centres, First Aid Essentials, Medical Emergency and Trauma Centres

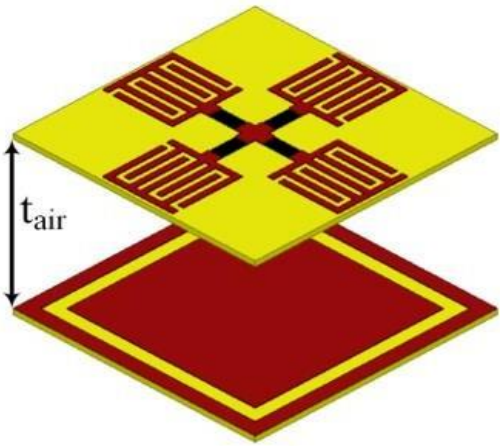
AMITY UNIVERSITY BIHAR

- **Smart Lifting and Dispensing Device Assembly for Heavy Weight Water Containers**

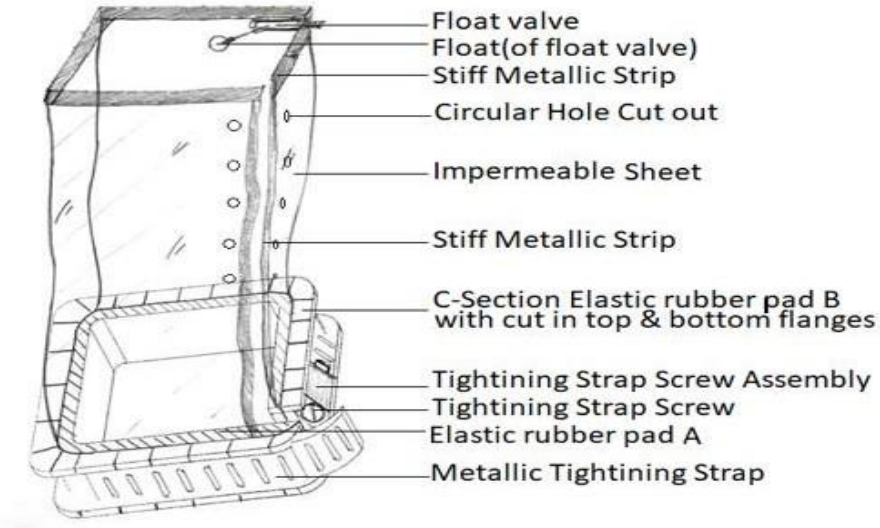
Recognizing the challenges associated with dispensing water from heavy-weight refillable containers, the device offers a creative solution. This inventive mechanism simplifies the process of lifting, rotating, and precisely aligning heavy water jars onto dispensers, enhancing user efficiency and convenience.



- **Efficient Electromagnetic Interference Suppression System** based on Ultra-Compact Interdigital Broadband Rasorber." This cutting-edge invention addresses the pressing need for electromagnetic interference (EMI) suppression in electronic devices. The miniaturized interdigital resonator-based broadband rasorber presents a breakthrough solution, featuring an array of interdigital resonators strategically designed to trap and dissipate microwave energy across a broad frequency spectrum.



- **Curing Apparatus System for Construction Structural Elements** with an auto-refill mechanism of the curing vessel, thus maintaining constant humidity thereof.The strength and durability of Reinforced Cement Concrete (RCC) significantly impact the overall robustness of a structure. However, maintaining the required humidity for concrete hydration, particularly in certain RCC structural components like columns and beams, poses a challenge with conventional curing methods. The newly proposed apparatus offers an innovative approach to this issue.



Chapter - 11 A BIRD'S EYE VIEW OF DIVERSE ACTIVITIES UNDERTAKEN BY ASTIF IN 2023

- **S20 CONFERENCE at "DISRUPTIVE SCIENCE FOR SUSTAINABLE DEVELOPMENT" (4th– 5th September 2023)**

ASTIF had organized the Science20 (S20)/G20 Conference as an outreach engagement under the patronage of INSA at Amity University Uttar Pradesh, Noida. **Dr. Jitendra Singh**, the Hon'ble Minister of State (Independent Charge) Ministry of Science & Technology, Minister of State for Prime Minister's Office, Ministry of Personnel, Public Grievances and Pensions, & Department of Atomic Energy & Department of Space, was the **Chief Guest**. **Dr. Mahesh Sharma**, Hon'ble Member of Parliament was the **Guest-of-Honour.**

Dr. Jitendra Singh being felicitated by Dr. Ashok Chauhan Founder President, Dr. Amita Chauhan, Chairperson and Dr. Atul Chauhan Chancellor AUUP

Dr. Ashutosh Sharma, President INSA and Co-Chair S20 delivered the Presidential address, Dr. Jitendra Singh, the Hon'able Minister delivered an Inaugural address.

Technology Exhibition

The Hon'ble Chief Guest also inaugurated the S20 Technology Exhibition which displayed technology/products developed by faculty and students at Amity Universities; and, DST STUTI, Delhi University, DST-SATHI Foundation-IIT Delhi. A few demonstrable prototypes were also exhibited.

Theme of the Conference

The theme for the Science 20 Conference held at Amity University was "**Disruptive Science for Innovative and Sustainable Development**. The Conference had four technical sessions on the following subthemes.

1. **Clean Energy for Greener Future**
2. **Universal Holistic Health**
3. **Role of Media in S&T**
4. **Science for Society and Culture**

In addition, there was a Round Table session on "**Innovation and Sustainability through Start-Ups**". The two-day Conference also held two parallel sessions for **school students** on Science Quizzes and Debate Competitions; about 200 students participated.


AMITY
UNIVERSITY


AMITY
UNIVERSITY

- **ASTIF Orations: ASTIF** identifies eminent speakers in the fields of S&T/Engineering/ Medicine, etc, and invites them to deliver expert talks that would resonate with the faculty/researchers and students, and they would benefit with new insight into the fields and take the advantage of the speaker's tacit knowledge and life-long hand on experience. The following celebrated experts were invited in the year 2023

    - ✓ Dr. Kalaiselvi, Director General, Council of Scientific & Industrial Research & Secretary, Department of Scientific and Industrial Research (DSIR)
    - ✓ Dr. Alok Dhawan, Director, Centre of BioMedical Research (CBMR)
    - ✓ Maj Gen (Dr.) Raman Kumar Marwah, Former Additional Director, Senior Consultant & Head, Department of Endocrinology and Thyroid Research Centre, Institute of Nuclear Medicine & Allied Sciences, DRDO, Ministry of Defence.

Dr N. Kalaiselvi, Director General Council for Scientific and Industrial Research (CSIR) inspired the young, budding scientists of Amity through her invigorating oration on "Energy Management - Indian Perspective"

Lecture on "Supporting **Risk in Science, Technology and Innovation for an Atmanirbhar Bharat" by Prof. Alok Dhawan, Director, Centre of BioMedical Research (CBMR)**

Guest Lecture on t he Topic "State of Vitamin D Deficiency Disorder in India and Measures to Deal with Public Health Problem"

- **Pathbreaking Scientific Achievements Deliberation in 2023.** A total of 3 brilliant researchers of Amity shared their outstanding research accomplishment in diverse areas under the series which was attended by 8 experts outside Amity in the related field from India and abroad.

- **ASTIF has formulated a draft "Policy for the promotion of start-ups at Amity" in** order to motivate our brilliant scientists to be entrepreneurs. The same is under implementation.

- **MoUs:** A total of **11 MoUs were initiated by ASTIF** in 2023 namely
  - ✓ Defence Institute of High-Altitude Research (***DIHAR***) -DRDO
  - ✓ Terminal Ballistics Research Laboratory (TBRL)-DRDO
  - ✓ Solid State Physics Laboratory (***SSPL***) -DRDO
  - ✓ India Glycols Ltd.
  - ✓ Compelson Labs
  - ✓ FARMLEY
  - ✓ ICMR (Renewed)
  - ✓ NIT Uttarakhand
  - ✓ Dr. Willmar Schwabe (Renewed)
  - ✓ Telangana University
  - ✓ INUP i2i program of MeitY at IIT Guwhati
  - ✓ Guwahati Medical College
  - ✓ The Catalysts Biotechnologies Pvt. Ltd
  - ✓ IGIMS, Patna
  - ✓ Astana University, Kazakhstan
  - ✓ Inferigence Quotient Private Limited
  - ✓ ***Association of Certified E-Discovery Specialists*** (***ACEDS***)
  - ✓ Nueberg Diagnostics

  Additionally, ASTIF has provided support for signing the 20+ MoU

- **Research Project Management System** on Amizone has been developed for approvals relating to procurement, reimbursement, advance, UC Submissions for AUUP Noida. **In 2023, the progress of 180 Projects was monitored**. A total of **1073 indents were raised in 2023** which were analyzed and approved for the release of funds. ASTIF is also involved in providing support to PIs for any project related activities. In addition, **38 cases of refund** were also processed.

- **Target setting and Monitoring** for Research and Innovation at Amity University Campuses for 2023. Online quarterly review meetings were undertaken to ensure achievement of the Target set.

- **MEGA MISSION: PUBLICATIONS** – ASTIF maintains the database of publications across Amity University and undertakes analysis, a report of which is shared on monthly basis.

- **Mission h-index:** ASTIF has been motivating the faculty members and sensitizing them to improve the faculty citations and their h-index.

- **Visit to Amity University campuses** is a regular practice to ascertain the health of the campus, specially in the area of research and innovation and support the University's endeavors. In 2023, the team visited Amity University **Chhattisgarh, Madhya Pradesh, Haryana.**

- Documentation of research accomplishments for QAA, UK.

- Data related to Accreditations such NAAC – AQAR (Criteria III), WSCUC panel review, NIRF, Write-ups as well as information for Academic council, IQAC & other University level meetings for AUUP was provided.

- ASTIF was also instrumental in facilitation of submission of nomination of Amity faculty and student for the prestigious awards such as

    - ✓ Ms Suhani Chauhan: **Pradhan Mantri Rashtriya Bal Puraskar for Innovation**
    - ✓ Agrivoltaic by Dr. V.K Jain & Team : **THE Asia awards 2024** under STEM Category. The innovation has been shortlisted amongst the top 8. The final results will be declared in April 2024.

- Visits undertaken by Dr. W. Selvamurthy for collaborations:

Visit detail	Objectives	Important persons involved/ interacted
Steering committee meeting organized on 10th Jan 2023 at CSIR Headquarters, Anusandhan Bhawan, Rafi Marg, New Delhi	review the progress made so far and chalking out a future course of action. Delivered presentation	Dr. N. Kalaiselvi and Dr. Meenakshi Singh
Meeting Prof. Ajay Kumar Sood, Principal Scientific Adviser (PSA) to Government of India at his office	To brief PSA about Amity's achievements	Prof. Ajay Kumar Sood, Principal Scientific Adviser (PSA)
Visit to S-VYASA, Bengaluru	LENR project collaboration between Amity and SVYASA (involvement of AINST)	Dr. Prahlad Ramarao
Visit to Defence Bioengineering and Electromedical Laboratory (DEBEL)	To foster research and academic collaborations between Amity faculties and DEBEL scientists and propose MoU signing	Dr T. M. Kotresh, Director, DEBEL and other senior scientists.
Visit IISER, Trivandrum to attend STUTI programme organised by DST alongside Dr. Nitin Batra	Suggestions and recommendations were provided to improve further sessions. Amity Presentation delivered	Director Dr. Narayana Murthy, who had come on deputation from IIT, Kanpur
International Conference on Unani Medicine 10-11 February, 2023 at Vigyan Bhawan, New Delhi. Theme of the event would be “Unani Medicine for Public Health”.	To Chair a Session on “Global Opportunities for Unani Medicine”	Union Minister Mr. Sonowal ji, Secretary Vaidya Kotecha and Dr. Asim Ali Khan

National Science Day lecture at Vigyan Bhawan on February 28, 2023	Amity participation at the National Science Day lecture at Vigyan Bhawan	Principal Scientific Advisor Dr. A.K. Sood, Secretary DST Dr. Chandrasekhar, Secretary DBT Dr. Rajesh Gokhale, Dr. M Ravichandran, Secretary, Earth Sciences and Dr. K. VijayRaghavan, former Principal Scientific Advisor Dr. P.S. Goel who is Chairman of National Innovation Foundation India Mr. R.K. Bhandari who knows you and late Dr. D.V. Singh Executive Director of Birla Institute of Scientific Research, Jaipur Prof. Purnendu Ghosh and Dr. A.M. Ramesh, CEO, Karnataka Science and Technology Academy, Bangalore
UNICEF, Chhattisgarh	to further expand the collaboration between UNICEF and Amity Universities.	Mr. Job Zachariah, Chief of UNICEF in Chhattisgarh
Visit to USA i) AFRL - Air Force Research Lab, Dayton, Ohio ii) DTRA – Defence Threat Reduction Agency, Washington D.C. iii) NASEM – National Academy of Science, Engineering & MedicineNIH – National Institute of		Col Jeffery Autrey, J Col USAF AFMC 711 HPW/RH• Dr. Anthony Waldroup, USAFSAM/CCP• Dr. Daniel Zelik, 711 HPW/CL• Dr. Saber Hussain, 711HPW/RH• Mrs. Martha Williamson, 711 HPW/XP• Dr. Nancy Kelley-Loughnane,

Healthiv) Amity New York Long Islands		AFRL/RX• Dr. John Boeckl, AFRL/RXOP• Dr. Nicholas Glavin, AFRL/RXDr. Michael Cheetham, Sr. Science Policy Analyst at The National Institutes of HealthColonel (Dr.) Raj GuptaDr. Micah LowenthalDr/ Dave FranzMs. Sripriya Ranganathan, Deputy Chief of Mission (DCM), at the Embassy of India Dr. Somnath Sengupta, President of "Every Life Works"
University of Hyderabad, Telangana during 17-18 April, 2023	To attend TEC Conclave and important presentation being delivered by Amity	
Shriram Institute for Industrial Research	57th Shriram Institute Founder Memorial Lecture	Shri Somnath S. Secretary, DOS and Chairman, ISRO
Dr Ambedkar International Centre, Delhi on April 24, 2023	To attend 'VishwaVidyalaya Anusandhan Utsav' where Amity PMU Team presented Amity Research activities including DST PURSE, DST FIST and DST STUTI	Dr. Jitendra Singh, Dr. S. Chandrasekhar, Secretary, DST, Dr. Akhilesh Gupta, Sr. Adviser, DST, Dr. Ramgopal Rao (Former Director- IIT Delhi and Current VC of BITS Pilani), and Dr. Appa Rao (Former VC, University of Hyderabad)
DRDO Bhawan	For the procurement of table-top models of DRDO developed products/weapon systems	Shri Haribabu Srivastava and Shri Vipin Kaushik

NITI Aayog on May 3, 2023	To deliver a presentation on "Seaweed value chain – Challenges and way forward"	Dr. V.K. Saraswat, Member, NITI Aayog
DRDO-Academia Conclave at Kothari Auditorium, DRDO Bhawan, New Delhi on 25-26 May, 2023	To attend the Conclave alongside Founder President and identify priority areas for boosting research at Amity	Dr. Samir V. Kamat, Dr. Haribabu Srivastava as well as Dr. Narendra Kumar Arya
Participation in India Defence Conclave organized by The Economic Times on May 26, 2023	Founder President being awarded at the inaugural session by Dr. Jitendra Singh, Hon'ble Minister of Science and Technology,	
visit to Chhattisgarh during June 3-5, 2023	Meeting with Prof (Dr.) Colonel Umesh Kumar Mishra. Chairman, Chhattisgarh Private Universities Regulatory Commission (CGPURC) Interaction with VC- AUC, HoIs/ HoDs, faculty members and researchers to take review of the progress made in terms of research and student admissions . To assess and review the performance of new Vice Chancellor of AUC.	Prof (Dr.) Colonel Umesh Kumar Mishra. Chairman, Chhattisgarh Private Universities Regulatory Commission (CGPURC)
India Habitat Centre on 17th June, 2023	To deliver lecture on "Creation of an Ecosystem of innovation in India" and active role of Amity in this regard	Shri S. N. Bhargava
Anusandhaan Chintan Shivir on 27th June 2023 at DRDO Bhawan, New Delhi.	identified priority areas were released and the potential impact they can have on our economic growth, innovation, and job creation was elucidated.	

Visit of Dr. N. Kalaiselvi, DG, CSIR to AUUP, Noida on 28 July, 2023	For ASTIF oration series- title of the talk was "Energy Management - Indian Perspective".	
Visit to Coimbatore to attend the Final Summit of Science20 Engagement group (synthesis & policy recommendations) during 21-22 July, 2023.	To discuss on the development of scientific R&D infrastructure through collaboration and partnerships among relevant parties, and discussion on Amity conducting the S20 event at AUUP	Dr. Ashutosh Sharma, President, INSA
Visit to DRDO Bhawan on August 3, 2023 to meet Dr. Samir V. Kamat, Chairman, DRDO	1. Invite Dr. Samir V. Kamat to attend and deliver his keynote address as Guest of Honour in the inaugural session and also to be the distinguished member of the Advisory Board in the upcoming S-20 Conference being 2. To discuss on the proposed "Indian Defence Conclave 2023" to be jointly organized by Amity University and DRDO 3. Invite Dr. Kamat to visit Amity University to deliver ASTIF oration series as per his convenience during the month of September 2023 and visit the labs.	
Meeting at NITI Aayog on 31st August, 2023	to discuss the plans and strategies to enhance performance of State Universities.	Dr. V.K. Saraswat, Member, NITI Aayog & Dr. Neeraj Saxena, Advisor

To participate in Workshop on “India’s Startup Revolution” under the One Week One Lab program on September 12, 2023 at CSIR-NPL Auditorium, New Delhi.	To participate, chair and deliver keynote address	
Participation in I.I.M.U.N's Kanyakumari Conference	To deliver keynote address as Chief Guest of the programme	
Participation in the International Conference cum Exhibition on "Aerospace & Aviation in 2047” organized by the Aeronautical Society of India (AeSI) on November 18, 2023 at Yashobhoomi Convention Centre, Delhi.	Attending the conference and identifying new opportunities in S&T in the area of space and aerospace	
Visit to Solid State Physics Laboratory, DRDO on November 22, 2023	1. To proceed with the signing of MoU between Amity University and Solid State physics Laboratory (SSPL), DRDO 2. To invite Dr. Meena Mishra, Director, SSPL to visit AUUP, Noida at a suitable date and time convenient to her and deliver a talk for our faculty members, researchers and students.	
Global Bio India Exhibition at Bharat Mandapam, Pragati Maidan on 5.12.2023	To ensure Amity's effective participation and identify opportunities where Amity can contribute effectively to Aatmanirbharta in the area of Biotechnology and allied areas	

Visit to National Research Institute of Unani Medicine for Skin Disorders (NRIUMSD), Erragadda, Hyderabad, Telangana on December 14, 2023	To attend National Seminar on "Innovation, Design, Entrepreneurship and Startups in Unani Medicine"	a. Dr. Shailendra Saraf Director National Institute of Pharmaceutical and Research, Hyderabad. b. Dr. S. Glory SwarupaDirector General, National Institute for Micro, Small and Medium Enterprises (ni-msme), Hyderabad.c. Mr. Mohsin DehlviManaging Director-Dehlvi Remedies Pvt. Ltd.President-World Unani FoundationGeneral Secretary-Unani Drugs Manufacturers Associationd. Dr. Sumer SinghDepartment of DesignIndian Institute of Technology Delhi
Visit to Indo-U.S. Science and Technology Forum (IUSSF), New Delhi	To build strong relationship with the organization and introduce to the achievements and initiatives of Amity	Dr. Nisha Mendiratta Executive Director

- **Some Events/ Visits/ Webinars organized by ASTIF**

Visit detail	Objectives
Dr. O. R. Nandagopan, Director of DRDO Industry Academia-Ramanujan Centre of Excellence (DIA-RCoE), IIT Madras on February 16, 2023	Invited to visit Amity and brief about the DIA-RCoE's activities, and encourage Amity faculty and researchers to participate in the research programme
Prof. Virinder Parmar, Faculty in Nanoscience, CUNY Graduate Center and in Chemistry, Lehman College & Medgar Evers College, The City University of New York (CUNY, USA) to Amity University on 5th April 2023	Lecture on "Current challenges and opportunities in Organic synthesis"
Dr. Satheesh Reddy, Scientific Adviser to the Minister of Defence to Amity University on April 19, 2023	Motivating and inspiring the students of the institute
DST Task Force to Amity on 22nd May 2023 • Shri S. S. Kohli • Dr. Murli Mohan • Dr. Praveen Arora, Scientist G, Advisor DST	Technical assessment of optimal utilisation S&T infrastructure created with the support of DST in AUUP
Dr. Suvrokamal Dutta, renowned political economic and foreign policy expert to AUUP Noida on July 11, 2023	to explore collaborative opportunities
Dr. Madhusudan Pal, Director, Footwear Design & Development Institute, Noida, Uttar Pradesh to Amity University Uttar Pradesh, Noida on October 6, 2023.	to explore collaborative opportunities with the FDDI Institute
Lt. Gen. P J S Pannu, PVSM, AVSM, VSM (Retd.) to Noida ON October 18, 2023	To discuss how his expertise can benefit Amity

AIIMS delegation visit to AUUP, Noida on October 13, 2023 Dr. Manjari Tripathi, HoD Neurology, AIIMS, and Dr. P. Sarat Chandra, Senior Professor, Dept of Neurosurgery	to explore research collaboration and including discussing Amity's participation in establishing a Centre of Excellence for Epilepsy Research
Delegation from Society of Indian Defence Manufactures (SIDM) to AUUP, Noida ON October 31, 2023 • DG Sunil K Misra, DG (Designate) Shri K Ramesh • Principal Advisor Maj Gen P K Saini, VSM (Retd)	Discussing collaborative initiatives
Delegation from Moscow Aviation Institute, Russia to AUUP, Noida on November 2, 2023 a. Mr.Alexey Zarechenskiy, Head International Department b. Mr. Alexander Balashov, Head of Science & Technology Section c. Ms. Sofya Spasskovs, Admission Manager	To identify new opportunities especially engaging in industry networking
TBRL Delegation on December 7, 2023 • Prof. Prateek Kishore, Outstanding Scientist and Director • Dr. P K Soni, Sc G • Dr. Pal Dinesh Kumar, Sc G • Dr. I P Sandhu, Sc FDr. Vijay Kumar, Sc F	To sign the MoU with Amity Universities & Institutions (AU) and discuss the cooperation both in academics and research
Delegation from SSPL, DRDO to AUUP, Noida on December 20, 2023	MoU signing and lecture delivered during the ongoing event

Dr. Meena Mishra, Ms. Vijeta Gambir, Scientist 'G', and Ms. Kartiki Mishra, Scientist 'E'	
Dr. Kimura from Japan on 13.01.2023, after his visit AIISM were able to organize a week course on Yoga for AIISM students.	Collaboration in Yoga
Dr. G. Athithan/ Former DG DRDO on February 24, 2023	Delivering talk
Dr Manoranjan Mohanty Scientist G / Adviser at the PSA office on February 27, 2023	Interactive session on important national programmes that he is handling like **"Millet" Mission of the Hon'ble PM, "Waste to Wealth", "Swachhta Saarti Samaroh", "Decentralised Waste Management" and, "Swachhta Saarthi Fellowship".**
HE Kamlesh Prakash, HC and, Counsellor Fiji on July 23, 2023	Collaboration
Mr. Manish Kumar Jha, Deputy Editor, The Financial Express	Promoting Amity innovations
Dr. U. Chandrasekhar, CEO at GMSIR Scientific Innovation and Research Centre and Former Scientist 'G' at Gas Turbine Research Establishment, GTRE-DRDO, Bangalore ON October 4, 2023	Discuss the potential collaborative research, entrepreneurial development, startups, technology development
Dr. Ashish Mahabal, Caltech, USA on December 18, 2023	Collaboration in space sciences
Dr. Vinod Kumar, Senior Lecturer in Microbial Technology and Biorefining, Centre for Renewable and Low Carbon Energy, along with Ms. Trisha Hegde, Representative South Asia Cranfield University, UK on 11th December 2023	Lecture and exploring possibility of collaboration

- **More than 180 presentations and panel discussions were delivered by Dr. W. Selvamurthy. In addition, he was also invited by various news channels such as Rajya sabha TV, Republic TV, NewsX, DD etc. for discussion on Space, Defence and other National priorities.**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- **Dr. W. Selvamurthy was invited by Niti Aayog to share his insights for inclusion in the** compendium of Extreme Cold Weather Technologies.

- **Dr. W. Selvamurthy along with a team of scientists from Amity was invited by Niti Aayog to share the work undertaken by Amity on** the Seaweed value chain. Dr. W. Selvamurthy also delivered a presentation on Challenges and way forward in the area.

- Dr. W. Selvamurthy was invited by Defence Institute of Physiology and Allied Sciences (DIPAS), DRDO to Chair the Preliminary Design Review meeting of Oxygen Enrichment Facility for High Altitude under project OXYSOL.

- **Amity Institute of Defence Technology**

✓ ASTIF coordinated the procurement of 12 DRDO table-top models from DRDO Hqrs for AIDT Lab
✓ ASTIF under the guidance of Dr. W. Selvamurthy has been supporting the institute of student dissertation and admissions.
✓

- Review and monitoring of Directorate of Technology Transfer & DST-TEC
- Review and monitoring of Projects relating to DRDO-TDF, T**echnical Assistance Program supported by DTRA** and Ami-Cube Sat.
- New Year Greetings and birthday greetings sent to all VCs, senior members and faculty/ researchers of Amity family (1600+) and 200+ external important dignitaries.
- Support was extended for various events across Amity Universe for inviting dignitaries, panelists as well as for successful culmination of the event.
- ASTIF was also involved in supporting the exhibitions and promotional activities of Amity such as UP Expo, IISF 2023, Global Bio India Summit etc.
- Disseminated information regarding Webinars/Conferences/ Workshops, Admission etc. to various faculties/dignitaries.
- Invitations for Honorary Doctorates for Convocation 2023 sent to various external dignitaries.
- Sent New Year greetings and birthday greetings to external dignitaries in various important positions and laboratories.