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KHAGOL

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Visit Report: French Consul General and Consular team at IUCAA

The French Consul General and Consular team, Mr. Jean-Marc Séré-Charletthe, French Consul General in Mumbai, and Dr. Philippe Maurinthe, the French Science and Higher Education Attaché, visited IUCAA on 22 July 2024. The visit aimed to explore the potential Indo-French collaborations in scientific research and innovation. The critical focus areas discussed included collaborative initiatives such as CEFIPRA, Space-astronomy-related projects, student exchange programs, and France's Year of Innovation for 2026.

Professor R. Srianand, Director, IUCAA, outlined IUCAA's priorities, ongoing research projects, and capabilities in his presentation during the meeting. He also highlighted the Indo-French collaborations involving IUCAA faculty members over several decades. This was followed by a presentation from the Consul General, Mr. Séré-Charlet, who highlighted France's strategic interests in fostering scientific partnerships with Indian universities.

The discussions focused on CEFIPRA Collaborations wherein the emphasis was placed on enhancing joint research efforts under the CEFIPRA framework - which supports bilateral projects between France and India in fundamental and applied research and future Astronomy and Space Projects. With France declaring 2026 as the Year of Innovation, there was discussion about using the opportunity to catalyse innovative projects between IUCAA and French research institutions. Potential ties with IUCAA to help with the planned increase in student exchange and mobility programmes were discussed due to IUCAA's wide reach in Indian universities.

Later, the delegation toured various facilities within the IUCAA campus, including the Instrumentation Laboratory - which provided first-hand insight into IUCAA's technological capabilities and research infrastructure. The visit concluded on a positive note with a mutual commitment to exploring concrete avenues for collaboration. Both parties expressed enthusiasm about leveraging each other's strengths to bring more interest and collaboration in astronomy and astrophysics. The visit underscored IUCAA's pivotal role as a hub for cutting-edge research and as a segue to Indian universities. Its potential to contribute significantly to Indo-French scientific cooperation was noted. Plans were discussed to follow up on specific project proposals and to facilitate exchange between researchers from IUCAA (and associated universities) and French institutions. The visit laid a foundation for ongoing dialogue and future partnership.

Events at IUCAA

Tutorial on IGWN-DHTC-OSG

A three day long tutorial on Introduction to the International Gravitational Wave Network, Distributed High-Throughput Computing and Open Science Grid was held at IUCAA from September 09 - 11, 2024. The tutorial focused on addressing the data analysis and computing requirements of the LIGO-India Scientific (LISC) community members. Miron Livny, the Principal Investigator of the HTCondor / OSG / PATh project and his HTCondor Software Suite team members, Greg Thain

and Rachel Lombardi, from the University of Wisconsin-Madison, USA, along with Siddharth Mohite, Computational Scientist, Pennsylvania State University, USA conducted the tutorial. The tutorial was attended by thirty participants, including students, post-doctoral scholars and faculty from various institutions, universities and colleges in India, including IUCAA.

The topics covered were related to the efficient use of large-scale computing resources for Gravitational Wave data analysis and research, using the HTCondor Software Suite at the individual large HTC computing clusters being provided by institutes like IUCAA and also through the Open Science Grid, using several of such resources spread across the entire world. The participants were also introduced to the latest techniques of accessing the LIGO data reliably and quickly anywhere across the LIGO Data Grid through the Open Science Data Federation (OSDF). The tutorial included lectures, hands-on sessions, and targeted technical interactions to solve specific challenges. The tutorial also had sessions on the administration of HTCondor clusters. The participants found this an excellent opportunity to learn from the experts directly. The feedback received from the participants was very encouraging and was appreciated by the broader LIGO computing community. Participants expressed the need for having such tutorials for longer duration and frequently. The tutorial was organised by Sandeep Joshi and Sanjit Mitra.

Events outside IUCAA

Workshop on Relativistic Cosmology: Theoretical and Data Analysis Techniques

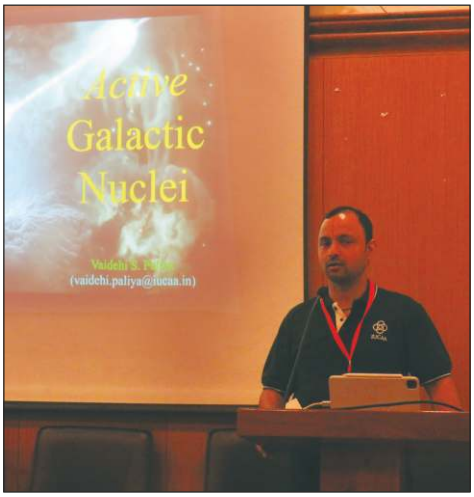
The Centre of Excellence for Astrophysics and Cosmology at G. H. Raisoni College of Engineering, Nagpur, organised a three-day workshop on Relativistic Cosmology: Theoretical and Data Analysis Techniques," from July 15 - 17, 2024. The workshop was a dynamic and intellectually stimulating event designed for junior researchers, physicists, and cosmologists passionate about exploring relativity's profound implications on our understanding of the universe. This workshop provided a unique forum for participants to engage in in-depth discussions, share groundbreaking research, and foster collaborations that push the boundaries of our knowledge in these fundamental areas of theoretical physics. The workshop included a series of lectures, presentations, and interactive discussions covering a broad spectrum of topics, including the mathematical foundations of relativity, gravitational waves, black holes, and applying relativistic principles to cosmological models. The introductory lectures on Relativistic Cosmology enabled the participants to gain insights into the latest developments in cosmology.

Through the workshop, attendees gained valuable insights, exchanged ideas with peers, and contributed to the collective advancement of our understanding of the cosmos. Whether delving into theoretical frameworks or exploring experimental approaches, the workshop served as a pivotal platform for intellectual exchange, fostering a collaborative spirit among participants and inspiring further exploration of the mysteries of the universe.

Lectures were delivered on the topic 'Observational Cosmology' by Surhud S. More (IUCAA), 'Basic Concepts of Cosmology' by Saibal Ray (GLA University, Mathura), and on 'Modern Cosmology'by Goutam Manna (Prabhat Kumar College, Kolkata). S. N. Hasan and Priya Hasan (Maulana Azad National Urdu University, Hyderabad) presented hands-on sessions that introduced Python, machine learning, and big data in cosmology. The Chief Guest of the valedictory function was an eminent personality, astrophysicist and cosmologist, Saibal Ray, Associate Director, Centre for Cosmology, Astrophysics and Space Science (CCASS), GLA University, Mathura and the guest of honour, renowned astronomer Priya Hasan, Assistant Professor of Physics, Maulana Azad National Urdu University, Hyderabad. The chairman and executive director of the Raisoni Group of Industries (RGI), Hon'ble Shri Sunil Raisoni, Chairman and Mr. Shreyas Raisoni acted as the patrons of the workshop. Maxim Khlopov, APC Laboratory, Paris (France), Andrew DeBenedictis, Simon Fraser University (Canada), S.K. Maurya, University of Nizwa, (Sultanate of Oman) and Megandhren Govender, Durban University of Technology (South Africa) were on the External Advisory committee for the workshop. Sachin Untawale, Director of GHRCE, was the Honorary Chair of the workshop. Dy-Director & Dean, Academics, Pramod Walke, Dy-Director & Dean, R&D, Santosh Jaju, and Dean, First year Department, Rupali Thete were the members of the Internal Advisory Committee of the workshop.

Saibal Ray (GLA University, Mathura), Surhud S. More (IUCAA) and Praveen Kumar Dhankar, Bhagwat Thakran, and Archna Deshpande (GHRCEN, Nagpur) coordinated the workshop. Rekha Patel and Rita Mate were the organizing members of this workshop. Surhud S. More (IUCAA) was the inaugural function's chief guest, and S.N. Hasan, Head and Professor, Department of Mathematics and Dean, School of Sciences, Maulana Azad National Urdu University, Hyderabad, was the guest of honour. The workshop was organized by Praveen Kumar Dhankar (G.H. Raisoni College, Nagpur) and Surhud More (IUCAA).

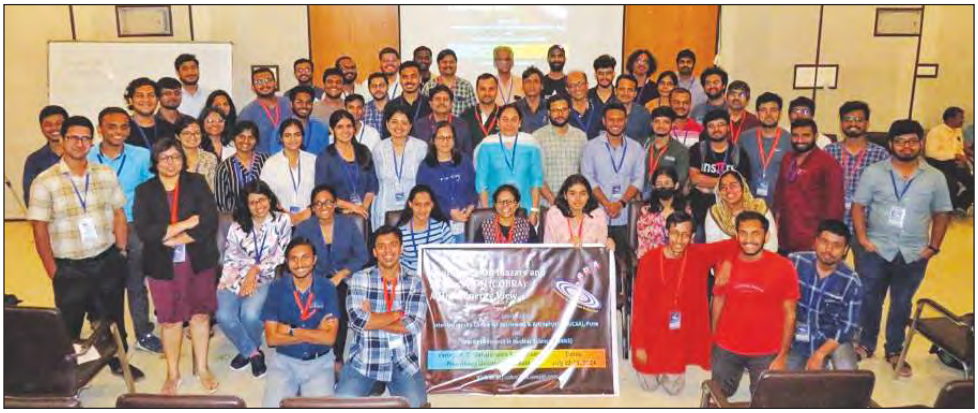
Workshop on Relativistic Cosmology: Theoretical and Data Analysis Techniques



An introductory workshop on Active Galactic Nuclei and Blazars was organized by the Presidency University, Kolkata during July 22 - 23, 2024. The workshop was a precursor to the " Blazars and Restless AGN': A High Energy View" conference held at Presidency University, Kolkata from July 24 - 26, 2024. The workshop was organized by the School of Astrophysics at the Presidency University, Kolkata and IUCAA, Pune. IUCAA provided financial support along with the Board of Research in Nuclear Sciences (BRNS). The workshop aimed at introducing the M.Sc, senior B.Sc students, and Ph.D scholars, primarily located in Kolkata, to the physics of active galactic nuclei (AGN) and related topics such as radiative processes, particle acceleration, accretion, observations & theoretical models of relativistic jets, astronomical detection of high energy photons and neutrinos, and potential career opportunities in Astronomy & Astrophysics. Fifty-five participants from various institutions took part in the workshop.

The workshop comprised day-long lectures with a 30-minute break between lectures. A set of multiple-choice-type questions were asked at the end of each lecture and the participants anonymously responded to those via a web page, which was set up by the organizers. The distribution of answers given by the participants demonstrated that they had learned the topics well. A discussion was held at the last session of the workshop to receive feedback about what the participants found useful in the workshop and what changes they would have preferred. Later, the lecture material was shared and detailed online anonymous feedback was taken from all participants.
The resource persons were Vaidehi Paliya (IUCAA), Sunder Sahayanathan (BARC), Indranil Chattopadhyay (ARIES), and Debanjan Bose (Central University of Kashmir). Vaidehi Paliya (IUCAA) and Ritaban Chatterjee (Presidency University, Kolkata) coordinated the workshop.

Conference on Blazars and Restless Active Galactic Nuclei (COBRA): A High Energy View



The "Conference on Blazars and Restless AGN (COBRA): A High Energy View" was held at Presidency University (PU) Kolkata from July 24-26, 2024. The School of Astrophysics at the Presidency University, Kolkata and IUCAA, Pune, organised the conference. IUCAA provided financial support along with the Board of Research in Nuclear Sciences (BRNS). Approximately eighty-five participants from various institutions nationwide took part in the conference. It was a continuation of a national-level biannual conference series organised since 2014 on high energy emissions from AGN. The PhD scholars and post-doctoral fellows were encouraged to contribute presentations and engage in the discussion of the results of their research with fellow participants. Sankar Bose, former Dean of Natural and Mathematical Sciences, Presidency University and Ranjeev Misra, Dean Visitor Academic Programmes, IUCAA, inaugurated the conference.

In the inaugural session, the speakers highlighted the glorious tradition of two centuries-old Presidency University (formerly Presidency College and Hindu College), from where generations of Indian scholars and scientists graduated. Referring to the School of Astrophysics established in 2022, which runs the M.Sc in Astrophysics programme, the speakers emphasised that this was the only centre in Eastern India carrying out research in astrophysics and cosmology. In this context, the speakers discussed IUCAA's mission to support teaching and research in astronomy and astrophysics at Indian universities.

The three-day conference comprised five invited talks, twenty-six contributed talks and seven posters - with three-minute flash talks on each poster. The presenters included seven MSc students, twenty PhD scholars, three post-doctoral fellows and eight faculty members. The twelve sessions over three days were chaired by Saumyadip Samui (Presidency University, Kolkata), Vaidehi Paliya (IUCAA), Samir Mandal (IIST, Thiruvananthapuram), Debanjan Bose (Central University of Kashmir), Savithri H. Ezhikode (CHRIST University, Bangalore), Sunder Sahayanathan (BARC, Mumbai), Soma Mandal (Government Girls' General Degree College, Kolkata), Zahir Ahmad Shah (Central University of Kashmir, Kashmir), Suchetana Chatterjee (Presidency University) and Ranjeev Misra (IUCAA). The presentations were focused on observations of blazars across the electromagnetic spectrum, including TeV and GeV gamma-rays, X-rays, optical and radio emission and related theoretical modeling of variability and spectral energy distribution, multi-wavelength observations of non-blazar AGN as well as ongoing and future instrumentation efforts for observations of high energy emission from AGN.

Among the invited talks, Sagar Godambe (BARC, Mumbai) described the current status and prospects of very high energy gamma-ray observations of AGN with MACE, Bhargav Vaidya (IIT Indore) discussed numerical simulations of AGN jets, Pankaj Kushwaha (IISER, Mohali) talked about the current status and challenges of multi-wavelength, multi-approach view of blazars, Debbijoy Bhattacharya (MCNS, Manipal) talked about observations of AGN beyond AstroSat, mainly, X-ray polarisation study and design requirements for future wide-field X-ray spectroscopic missions, and Savithri H. Ezhikode (CHIRST, Bangalore) gave an overview of X-ray observations of non-blazar AGN. In the concluding session, Ranjeev Misra discussed the summary of the new results and gave an overview of the presentations. He provided general advice about research in astronomy and astrophysics to MSc students, research scholars, and early-career scientists. Emphasising the importance of probing the underlying physics implied by the observed data and its rudimentary description and analyses he added that it was essential to develop a culture of regularly writing observing proposals to national and international facilities and setting up groups on social media platforms to interact with other Indian AGN scientists to discuss minor technical problems, e.g., troubleshooting data analysis software issues. The organisers requested the participants to provide their anonymous feedback online.

The Scientific Organizing Committee comprised Pratik Majumdar (SINP, Kolkata), Varsha Chitnis (TIFR, Mumbai), Gulab Dewangan (IUCAA), Ranjeev Misra (IUCAA), Soumen Mondal (Jadavpur University, Kolkata), Vaidehi Paliya (IUCAA), Sunder Sahayanathan (BARC, Mumbai), Amit Shukla (IIT Indore), C. S. Stalin (IIA, Bangalore) and Ritaban Chatterjee (Presidency University, Kolkata). Pratik Majumdar (SINP, Kolkata) was the co-convenor, and Ritaban Chatterjee (Presidency University, Kolkata) was the convenor of the conference. The conference was coordinated by Vaidehi Paliya (IUCAA) and Ritaban Chatterjee (Presidency University).

Probing Stars and Galaxies using Innovative Data Science Tools

The Department of Applied Sciences, Gauhati University, Assam, organised a three-day workshop titled "Probing Stars and Galaxies using Innovative Data Science Tools" from September 04 - 06, 2024, in collaboration with IUCAA, Pune, Anusandhan National Research Foundation (ANRF), New Delhi, and National Innovation Foundation (NIF), Gandhinagar. Fifty-six students pursuing their master's degrees and research scholars from different universities attended the workshop. It comprised lectures and hands-on tutorials in Data Science presented by twenty-four speakers and resource persons from various universities and research institutes.

Nani Gopal Mahanta, honourable Vice-Chancellor of Gauhati University, attended the inaugural session. In his welcome address, he acknowledged the importance of learning data science tools that students can apply to the plethora of astronomy and space science data. Ajit K. Kembhavi, Emeritus Professor IUCAA, delivered the inaugural lecture on Artificial Intelligence and Machine Learning - A Birds Eye View for Astronomers. Ninan Sajeeth Philip (AIRIS4D, Kerala) and Ranjan Gupta (IUCAA) gave invited lectures on data science and automated methods in astronomy. In the afternoon session, H. P. Singh (Delhi University) gave an overview of four different astronomical data analysis projects for hands-on-sessions to the participants. The hands-on sessions, conducted parallelly in four computer labs, were led by the resource persons in the afternoon sessions of the workshop on all three days. The morning sessions of the next two days of the workshop consisted of invited lectures on contemporary research in stars and galaxies at all wavelengths. Annapurni Subramaniam (Director, IIA) and D. K. Ojha (TIFR, Mumbai) delivered keynote lectures on star clusters and star formation, respectively, while S. K. Pandey (Raipur University) and Kanak Saha (IUCAA) gave lectures on galaxies. S. B. Pandey (ANRF) and Arvind Ranade (Director, NIF) provided an overview of funding opportunities for research and innovation programs. The workshop also included remote lectures from several experts from abroad-- Lucas Macri (Director, US-ELT program), Ashish Mahabal (Caltech, USA), Shashi Kanbur (SUNY-Oswego, USA), and Marcella Marconi (INAF, Naples), who covered various aspects ranging from upcoming large telescopes to theoretical modeling of stars. The participants also visited the Gauhati University observatory during the workshop.

The workshop covered a wide range of topics on multiwavelength studies of stars and galaxies and provided participants with a succinct introduction to relevant aspects of astronomy alongside an in-depth exploration of various astronomical data types, including images, spectra, time-series data, and catalogs. Participants were exposed to a flavour of advanced astronomy research and learned introductory data analysis and machine learning concepts and techniques. A few student participants also presented their research projects in the last session. H. P. Singh chaired the concluding session attended by Jagadish Sharma, Secretary (i/c), University Classes, (Gauhati University). The workshop was coordinated by Eeshankur Saikia (Gauhati University) and Anupam Bhardwaj (IUCAA).

Contemporary Issues in Astronomy and Astrophysics

A national workshop on 'Contemporary Issues in Astronomy and Astrophysics 2024 (CIAA 2024) was organised by the Department of Physics, Shivaji University, Kolhapur, from September 13 - 15, 2024, in collaboration with IUCAA. The workshop aimed to create awareness regarding the advancements in Astronomy and Astrophysics among the graduates, post-graduates and research students in the country. The workshop was of great significance on multiple fronts in Astronomy and Astrophysics. It was pivotal in advancing scientific knowledge of Gravitational Waves, the role of the LIGO

detector, LIGO-India's contribution, the Solar Ultraviolet Imaging Telescope (SUIT) onboard the Aditya-L1 mission and the physics of compact stars that provide a unique laboratory to study the structure of matter under extreme conditions, in which all known forces - gravitation, electromagnetism, weak and strong interactions - play a role. Understanding their properties was paramount for both the astrophysicist and the fundamental physicist. One hundred and thirty participants from across the country registered for the workshop. Of these there were ninety undergraduates and post-graduates, fifteen research scholars and twenty-five faculty, including guest lecturers.

R. Srianand (Director, IUCAA) inaugurated the workshop in the presence of D. T. Shirke (Pro-Vice-Chancellor), P. S. Patil (Vice-Chancellor) and R. G. Sonkawade (Professor and Head, Physics Department). After the inaugural session, R. Srianand (IUCAA) delivered two invited lectures on the advancements in Astronomy and Astrophysics, followed by two talks on Special Relativity and the Theory of General Relativity by Sanjit Mitra (IUCAA). The first day concluded with a talk on 'Black holes: Accretion, Jet and Identification" by B. Mukhopadhyay (IISc, Bangalore). The second day began with a talk on 'Gravitational Waves: An overview' by S. V. Dhurandhar (IUCAA), followed by two talks on 'Astronomical Telescopes and Instrumentation' and 'Solar Ultraviolet Imaging Telescope onboard Aditya L-1' by A.N. Ramaprakash (IUCAA). A visit to the IIG-Kolhapur Radar Centre and the Panhala Space Centre of Shivaji University was scheduled for the second half of the day. During the visit, A. N. Ramprakash advised on ways to improve the upper atmosphere analysis using the three instruments: CCD-based Multiwavelength Airglow Photometer (CMAP), PRL Airglow InfraRed Spectrograph (PAIRS) and Multiwavelength imaging spectrograph (MISE) and referred to the filters used in the instruments to study different emission lines of Oxygen, Nitrogen and Hydroxyl ions. The Department of Physics will work towards strengthening its interaction with IUCAA, Pune, to help reinforce the Panhala Space Centre facilities.

On the concluding day, September 15, 2024, S.V. Dhurandhar delivered two talks on 'Gravitational Waves: An overview-II' and 'How the LIGO-India collaboration started. These talks were followed by a 'Future of Gravitational Waves' talk by Sanjit Mitra (IUCAA). B. Mukhopadhyay (IISc) delivered a talk on 'Massive White Dwarfs and Neutron Stars' by B. Mukhopadhyay. The academic program concluded with the talk on 'Future of Gravitational Waves' by Sanjit Mitra (IUCAA). The participants were requested to submit their feedback about the workshop. The valedictory ceremony was held at 3.30 p.m., and participants provided positive feedback. The workshop served as an invaluable educational platform, inspiring the aspirations of students and early-career researchers, thereby nurturing the next generation of scientists. The workshop equipped the participants with comprehensive knowledge and technical skills. A key highlight of the CIAA-2024 workshop was the opportunity for students and researchers to interact directly with the experts in the field. The workshop was coordinated by Siba Prasad Das (Shivaji University) and Sanjit Mitra (IUCAA).

2nd Himalayan Meet of Astronomers (HMA) 2024

A two-day Himalayan Meet of Astronomers was organised by the University of Kashmir, the ICARD Center, Department of Physics and Astronomical Sciences (DPAS), Central University of Himachal Pradesh (CUHP) and IUCAA, Pune from September 14 - 15, 2024 at the Central University of Himachal Pradesh (CUHP), Dharamshala.

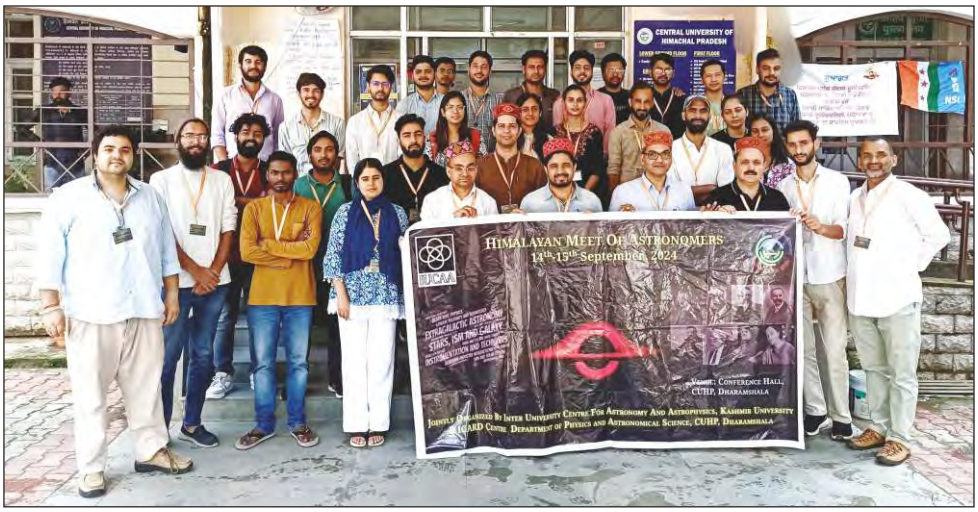
The meet was organised to:

1. Provide a platform for the PhD students, postdoctoral or recently joined young faculty researchers to present and discuss their current research projects.
2. To facilitate feedback and guidance from senior astronomers to enhance the quality and impact of ongoing research.
3. To promote collaboration among young

researchers in Astronomy and Astrophysics.

4. To build a network of researchers and institutions focused on advancing astronomical research in the Himalayan region.

In addition to the brief about their work from the experts, the primary component of the meeting was the presentations given by the participants explaining their research work, findings and the feedback and valuable suggestions from the expert faculty.



The conference was attended by twenty-two PhD students, two post-doctoral fellows, and three M.Sc. students from various institutes and universities in the Himalayan regions. The expert faculty included Durgesh Tripathi (IUCAA), Naseer Iqbal (University of Kashmir), Hum Chand (CUHP), Sowgat Muzahid (IUCAA), Anupam Bhardwaj (IUCAA), and Jeevan C. Pandey (ARIES). The workshop was coordinated by Hum Chand (CUHP), Naseer Iqbal (University of Kashmir) and Ranjeev Misra (IUCAA).

Welcome to...

V. N. Nived and **Anshuman Borgohain** who have joined IUCAA as Post-Doctoral Fellows.

Yogita Kumari, Soumil Girish Sahu, Khushi Lalit, Shubham Sati and **Mohd. Asim Ansari** who have joined IUCAA as Research Scholars.

Visiting Associates selected with effect from 01 August 2024

1. **Dr. Md Sabir Ali,**
   Department of Physics, Mahishadal,
   Raj College (Affiliated To Vidyasagar University)
   Medinipur, West Bengal.
2. **Dr. Soumya Chakrabarti,**
   School of Advanced Sciences,
   Vellore Institute of Technology, Tamil Nadu.
3. **Dr. Samyaday Choudhury,**
   Ahmedabad University, Ahmedabad Gujarat.
4. **Dr. Shubhrangshu Ghosh,**
   Center For Gravitation, Cosmology and Cosmology(CAGC),
   SRM University Sikkim.
5. **Prof. Prabir Kumar Haldar,**
   Department of Physics,
   Cooch Behar Panchanan Barma University West Bengal.
6. **Prof. Syed Najamul Hasan,**
   Maulana Azad National Urdu University,
   Hyderabad Telangana.
7. **Dr. Gopal Hazra,**
   Department of Physics,
   Indian Institute of Technology Kanpur, Uttar Pradesh.
8. **Dr. Nur Jaman,**
   Dhruba Chand Halder College, 24 Parganas,
   West Bengal.
9. **Dr. Chandan Joshi,**
   JECRC University, Jaipur, Rajasthan.
10. **Dr. Haris M K,**
    Department of Physics,
    National Institute of Technology Calicut, Kerala.
11. **Prof. Subhash Kumar,**
    Department of Physics,
    Acharya Narendra Dev College (University of Delhi), Delhi.
12. **Dr. Upendra Kumar Singh Kushwaha,**
    Department of Physics,
    University of Allahabad, Uttar Pradesh.

13. **Dr. Poonam Mehta,**
School of Physical Sciences,
Jawaharlal Nehru University, New Delhi.

14. **Dr. Rupak Mukherjee,**
Sikkim University, Gangtok, Sikkim.

15. **Dr. Sajal Mukherjee**
BITS-Pilani Campus, Rajasthan.

16. **Prof. Dibyendu Nandi,**
Indian Institute of Science Education and Research
Kolkata.

17. **Dr. Sabyasachi Pal,**
Midnapore City College, Midnapore, West Bengal.

18. **Dr. Kanik Palodhi,**
Department of Applied Optics, University of Calcutta,
Kolkata.

19. **Dr. Abhishek Paswan,**
Department of Physics,
University of Allahabad, Prayagraj, Uttar Pradesh.

20. **Dr. Prashant Pathak,**
Indian Institute of Technology Kanpur, Uttar Pradesh.

21. **Dr. Raj Prince,**
Department of Physics, Institute of Science,
Banaras Hindu University, Varanasi, Uttar Pradesh.

22. **Dr. Aasheesh Raturi,**
Dolphin PG Institute of Biomedical and Natural Sciences,
Dehradun, Uttarakhand.

23. **Dr. Sonali Sachdeva,**
Jaypee University Anousheh, Uttar Pradesh.

24. **Dr. Kaushal Sharma,**
Regional Forensic Science Laboratory, Uttar Pradesh.

25. **Dr. Prerana Sharma,**
Government Ujjain Engineering College,
Ujjain, Madhya Pradesh.

26. **Dr. Mayuresh Prakash Surnis,**
Indian Institute of Science Education and Research,
Bhopal, Madhya Pradesh.

27. **Dr. Shabnam Iyyani Syamsunder,**
School of Physics, Indian Institute of Science Education
and Research, Thiruvananthapuram, Kerala.

28. **Dr. Vivek Baruah Thapa,**
Department of Physics, Bhawanipur Anchalik College,
Assam.

29. **Dr. Ajay Tripathi,**
Department of Physics,
Sikkim University, Gangtok, Sikkim.

30. **Dr. Surender Verma,**
Department of Physics & Astronomical Science,
Central University of Himachal Pradesh,
Kangra, Himachal Pradesh.

31. **Dr. Vinu Vikraman,**
Department of Physics,
Central University of Kerala, Kerala.

32. **Dr. Abhay Pratap Yadav,**
Department of Physics and Astronomy,
NIT Rourkela, Odisha.

Visiting Associates term Extended with Effect from 01 August 2024

1. **Dr. Gazi Ameen Ahmed,**
Department of Physics, Tezpur University, Assam.

2. **Dr. Sampurn Anand,**
Department of Physics,
Central University of Tamil Nadu, Thiruvarur, Tamil Nadu.

3. **Dr. Indrani Banerjee,**
Department of Physics, and Astronomy,
National Institute of Technology, Rourkela, Odisha.

4. **Prof. Shyamal Kumar Banerjee,**
School of Basic Science & Research,
Sharda University, Greater Noida.

5. **Dr. Prasad Basu,**
Department of Physics,
Cotton University, Guwahati, Assam .

6. **Dr. Piyali Bhar,**
Department of Mathematics, Government General Degree
College, Hooghly, West Bengal .

7. **Dr. Bari Maqbool Bhat,**
Department of Physics, Islamic University of Science and
Technology, Pulwama, Jammu and Kashmir.

8. **Dr. Ritabrata Biswas,**
Department of Mathematics,
The University of Burdwan, West Bengal.

9. **Dr. Debasish Borah,**
Department of Physics,
Indian Institute of Technology, Guwahati Assam.

10. **Dr. Koushik Chakraborty,**
Institute of Education (P.G.) For Women,
Chandannagar, West Bengal.

11. **Dr. Laxmikant Chaware,**
Centre for Basic Sciences,
Pandit Ravishankar Shukla University, Raipur.

12. **Prof. C.D. Ravikumar,**
Department of Physics,
University of Calicut, Kozhikode, Kerala.

13. **Dr. Partha Sarathi Debnath,**
Department of Physics, A.P.C. Roy Government College,
Himachal Siliguri, West Bengal.

14. **Dr. Shanti Priya Devarapalli,**
Department of Astronomy, University College of Science
Osmania University, Hyderabad, Telangana.

15. **Dr. Anoubam Senorita Devi,**
Department of Physics,
Manipur University, Canchipur, Imphal, Manipur.

16. **Prof. Vijayakumar Honnappa Doddamani,**
Department of Physics,
Bangalore University, Bengaluru, Karnataka.

17. **Dr. Broja Gopal Dutta,**
Department of Physics,
Rishi Bankim Chandra College, Naihati, West Bengal.

18. **Dr. Jibitesh Dutta,**
Department of Basic Sciences and Social Sciences,
School of Technology, North-Eastern Hill University,
Shillong, Meghalaya.

19. **Dr. Sudip Kumar Garain,**
Department of Physical Sciences, Indian Institute of
Science, Education and Research, Kolkata, West Bengal.

20. **Dr. Suman Ghosh,**
Department of Physics,
Birla Institute of Technology Mesra, Ranchi, Jharkhand.

21. **Dr. Tuhin Ghosh,**
School of Physical Sciences, National Institute of Science
Education and Research, Odisha.

22. **Dr. Sarbari Guha,**
Department of Physics, St. Xavier's College, Kolkata.

23. **Dr. Golam Mortuza Hossain,**
Department of Physical Sciences,
IISER, Kolkata, West Bengal .

24. **Dr. Joe Jacob,**
Department of Physics, Newman College, Kerala.

25. **Dr. Rajeev Kumar Jain,**
Department of Physics,
Indian Institute of Science, Bengaluru, Karnataka.

26. **Prof . Deepak Jain,**
Deen Dayal Upadhyaya College (University of Delhi),
Dwarka, New Delhi.

27. **Dr. Jessy Jose,**
Department of Physics, IISER Tirupati, Mangalam.

28. **Dr. Charles Jose,**
Department of Physics, Cochin University of Science and
Technology (CUSAT), Kochi, Kerala.

29. **Dr. Minu Joy,**
Department of Physics, Alphonsa College, Kerala.

30. **Dr. Jeena K.,**
Department of Physics,
Providence Women's College, Calicut Kerala.

31. **Dr. Nishikanta Khandai,**
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Education and Research, Bhubaneswar.

32. **Dr. Mamta,**
Dept. of Physics, and Electronics,
S.G.T.B. Khalsa College, University of Delhi Campus, Delhi.

33. **Dr. Biman Jyoti Medhi,**
Department of Physics, Gauhati University, Assam.

34. **Dr. Sourav Mitra,**
Department of Physics,
Surendranath College (University of Calcutta) Kolkata.

35. **Dr. Sajahan Molla,**
Department of Physics, New Alipore College, Kolkata.

36. **Dr. Soumen Mondal,**
Department of Physics, Jadavpur University, Kolkata.

37. **Prof. Hemwati Nandan,**
Department of Physics,
HNB Garhwal University, Uttarakhand.

38. **Dr. Rajesh Kumble Nayak,**
Department of Physical Sciences, Indian Institute of
Science Education and Research (IISER) – Kolkata,
West Bengal.

39. **Prof. Sanjay Kumar Pandey,**
Department of Mathematics,
Shri. L.B.S. Degree College, Gonda, Uttar Pradesh.

40. **Dr. Biswajit Pandey,**
Department of Physics, Siksha Bhavana,
Visva-Bharati University Santiniketan West Bengal.

41. **Dr. Uma Papnoi,**
Department of Physics, Government PG College, Raipur.

42. **Dr. Amit Pathak,**
Department of Physics,
Banaras Hindu University, Varanasi, Uttar Pradesh.

43. **Dr. Bikash Chandra Paul,**
Department of Physics,
North Bengal University, Siliguri, West Bengal.

44. **Dr. Bhargav Pradeep Vaidya,**
Discipline of Astronomy,
Astrophysics and Space Engineering,
Indian Institute of Technology, Indore, Madhya Pradesh.

45. **Dr. Ananta Charan Pradhan,**
Department of Physics and Astronomy,

National Institute of Technology, Rourkela, Odisha.

46. **Dr. Farook Rahaman,**
Department of Mathematics, Jadavpur University, Kolkata.

47. **Dr. Chayan Ranjit,**
Department of Mathematics,
Egra S.S.B. College, Medinipur, West Bengal.

48. **Dr. Reshma Sada Raut Dessai,**
School of Physical and Applied Sciences,
Goa University, Goa.

49. **Dr. Aswathy S.,**
Department of Physics,
Providence Women's College, Calicut, Kerala.

50. **Prof. Sanjay Kumar Sahay,**
Department of Computer Science and Information Systems, BITS-Pilani, Zuari Nagar, Goa.

51. **Prof. Sandeep Sahijpal,**
Department of Physics, Panjab University, Chandigarh.

52. **Dr. Prasant Samantray,**
Department of Physics, BITS-Pilani Hyderabad Campus, Secunderabad, Telangana.

53. **Dr. Subrata Sarangi,**
Department of Physics, Centurion University of Technology and Management, Bhubaneswar.

54. **Dr. Rathin Sarma,**
Department of Physics,
Rabindranath Tagore University, Hojai, Assam.

55. **Prof . Asoke Kumar Sen,**
Department Of Physics,
Assam University, Silchar, Assam.

56. **Prof . Somasri Sen,**
Department of Physics, Jamia Millia Islamia, New Delhi.

57. **Dr. Priya Hasan,**
Department of Physics, Maulana Azad National Urdu University. Hyderabad, Telangana.

58. **Dr. Aishawnnya Sharma,**
Department of Physics, Bahona College, Assam.

59. **Dr. Ranjan Sharma,**
Department of Physics, Cooch Behar Panchanan Barma University, Cooch Behar, West Bengal.

60. **Dr. Amit Shukla,**
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61. **Dr. Alkendra Singh,**
Department of Physics,
Institute of Science Banaras Hindu University Varanasi.

62. **Prof. Parijat Thakur,**
Department of Pure and Applied Physics,
Guru Ghasidas Central University Bilaspur, Chattisgarh.

63. **Dr. Vithal P. Shet Tilvi,**
Department of Physics,
Government College, Khandola, Goa.

64. **Dr. Sanil Unnikrishnan,**
Department of Physics,
St. Stephen's College, University Enclave, New Delhi.

65. **Dr. Sudhaker Upadhyay,**
Department of Physics, K.L.S. College Nawada
(A Constituent Unit of Magadh University Bodh Gaya)
Bihar.

Farewell to...

Sourav Bhadra, Jaiverdhan Chauhan, Dhruv Pathak and **Prasia P.**, Post-Doctoral Fellows, who left IUCAA on the completion of their tenure or to take up a new assignment.

Samanwaya Mukherjee, Labanya Kumar Guha, Shrabani Kumar, Amit Kumar, Navin Lalta Prasad Chaurasiya, Sukanya Mallik, and **Meenakshi,** Research Scholars, who left IUCAA at the end of their tenure.

Sanket Ajay Munishwar, Junior Research Fellow, who left IUCAA to take up a new assignment.

Colloquium

11.07.2024 Samir D. Mathur on ***The black hole information paradox.***

22.08.2024 T. R. Govindarajan on ***Ultra-light dark matter: a novel proposal.***

19.09.2024 Michael Rutkowski on ***How the UV reveals cosmic evolution: a brief review with HST, AstroSat, and JWST.***

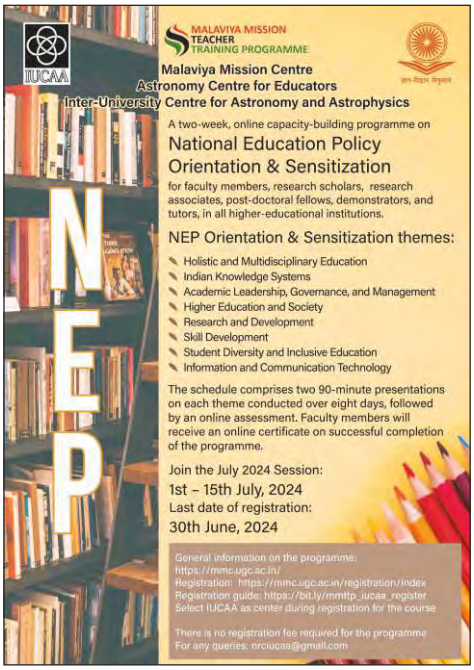
Seminars

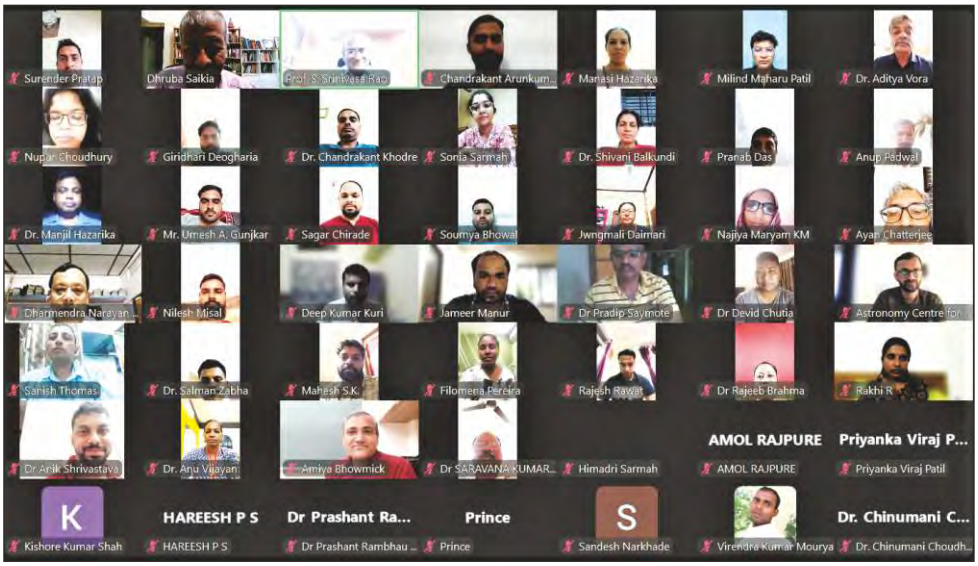
02.07.2024	Madhurima Choudhury on ***Deciphering the Epoch of Reionization with the HI 21-cm Signal and Neural Networks.***
04.07.2024	Dimple Panchal on ***A Data-Driven Approach to GRB Classification: Unveiling Diversity with Machine Learning.***
09.07.2024	Vikram Khaire on ***Tracing the Shadows of Civilizations: Tools for Hunting Alien Megastructures in Transits.***
25.07.2024	Mukul Bhattacharya on ***Magnetized outflows from protomagnetars as the sources of heavy nuclei and multi-messenger emission.***
24.09.2024	Hamsa Padmanabhan on ***Deciphering Cosmic Dawn: Conquest of the Final Frontier.***
26.09.2024	Subhankar Patra on ***General relativistic accretion flow around non-Kerr black holes.***

Astronomy Centre for Educators

Malaviya Mission Teacher Training Centre

National Education Policy (NEP) Orientation and Sensitization Programmes: 2024 July





An NEP Orientation and Sensitization Programme under the Malaviya Mission Teacher Training Programme was held online from 1st to 15th July 2024. For this programme, the resource persons were Arima Mishra, Azim Premji University and Anwesha Borthakur, KU Leuven, on Indian knowledge systems; Maithreyi Ravikumar, Karnataka Health Promotion Trust, and Brinda Kharbirymbai, NEHU, on skill development; S. Seetha, ISRO and Raman Research Institute, and R. Srianand, IUCAA, on research and development; Sherin Sabu, IIT Jodhpur and Prakash Arumugasamy, IUCAA on Information and Communication Technology; Ashok Kumar Mocherla, IIT Indore and S. Srinivasa Rao, Mahindra University, on student diversity and inclusive education; Dhruba J Saikia, IUCAA and Sourav Pal, Ashoka University, on academic leadership, governance and management; Kalpana Sarathy, TISS Guwahati, and Saumen Chattopadhyay, JNU, on higher education and society; Dhruba J Saikia, IUCAA, and Brinda Kharbirymbai, NEHU, on holistic and multi-disciplinary education. There were about 90 participants in the programme.

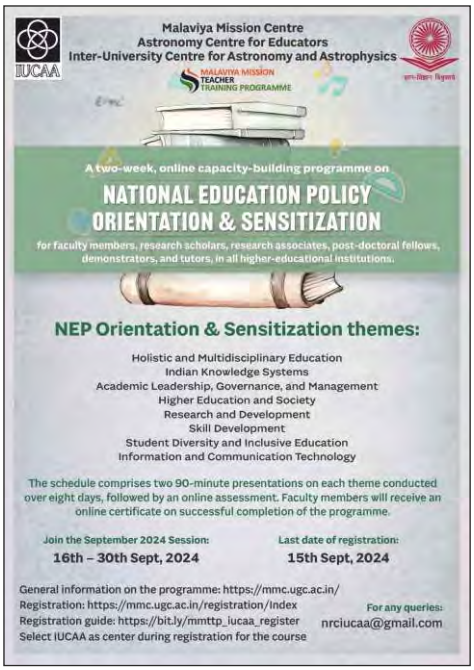
Science, Astronomy and Society

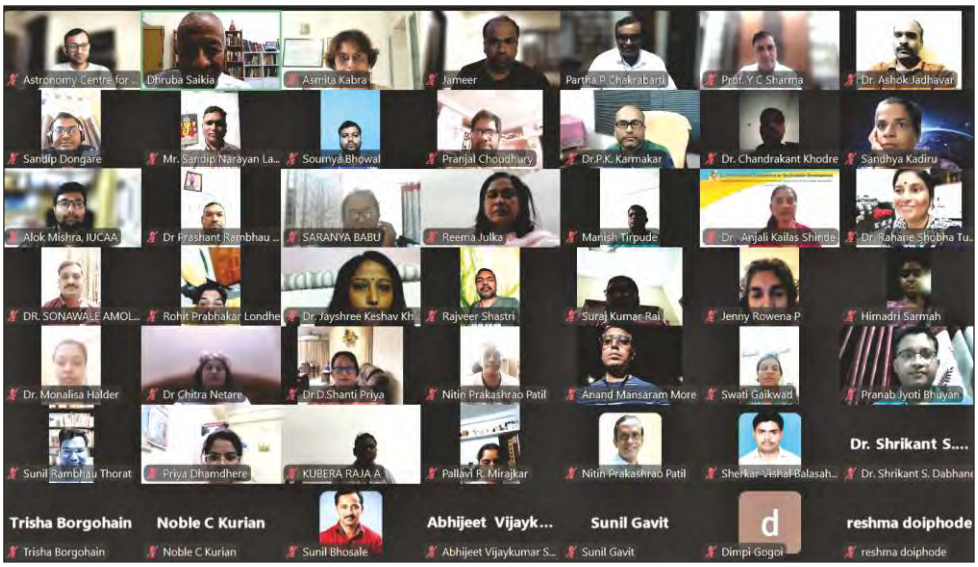
A workshop on the theme of Science, Astronomy and Society, was organized from 3rd to 5th September 2024 by the Maharashtra State Faculty Development Academy (MSFDA) and the Astronomy Centre for Educators of IUCAA at MSFDA, Pune. The objectives of these workshops which are often held in smaller towns of Maharashtra are to bring the excitement of astronomy and science to faculty members across disciplines and also discuss broader issues related to science and society such as inclusiveness and non-discrimination. On the first day of this workshop Jameer Manur gave an overview of the nearby Universe, Moupiya Maji spoke on exoplanets, Sanjit Mitra introduced them to gravitational waves and LIGO while Prakash Arumugasamy conducted a hands-on session on understanding the changing sky. The participants visited the Giant Metrewave Radio Telescope (GMRT) on the 4th of September where GMRT scientists Kaushal Buch and Shubendu Joardar, and Jameer Manur spoke to them on the telescope and showed them around. On the final day, Vaidehi Paliya introduced them to the Universe at high energies, Sudha Rajamani from IISER Pune spoke on the chemical origin of life and Dhruba J. Saikia gave a glimpse of astronomy and the Moon. The participants enthusiastically took part in all the events. The workshop had about forty participants including resource persons and organizers. This was organized by Suraj Babar and Ganesh Bhise from MSFDA and Team ACE, IUCAA.

Participants of the Science, Astronomy and Society workshop at GMRT

National Education Policy (NEP) Orientation and Sensitization Programmes: 2024 September

An NEP Orientation and Sensitization Programme under the Malaviya Mission Teacher Training Programme was held online from 16th to 30th September 2024. For this programme, the resource persons were Vasant Shinde, CCMB Hyderabad and former Vice-Chancellor, Deccan College Deemed to be University, and Purnima Bhatt, Hood College, Maryland, on Indian knowledge systems; Parth P. Chakrabarti, former Director, IIT Kharagpur and Sudha Rajamani, IISER Pune, on research and development; Asmita Kabra, Dr. B.R. Ambedkar University, and Shubhangi Vaidya, Indira Gandhi National Open University, on holistic and multidisciplinary education; N. Sathyamurthy, Founding Director, IISER Mohali, and Somak Raychaudhury, Vice-Chancellor, Ashoka University, on academic leadership, governance and management; Akalesh Kumar Verma, Cotton University, and Amman Madan, Azim Premji University, on higher education and society; Virginius Xaxa, former Deputy Director, TISS Guwahati, and Nandini Manjrekar, former Dean, TISS Mumbai, on student diversity and inclusive education; Santosh Mehrotra, Jawaharlal Nehru University on skill development; and Yogendra Pal, NIIT





University on information and communication technology. There were about 90 participants in the programme.

Astronomy-themed experiments competition

An astronomy-themed experiments competition was announced in 2024 August with the last date of registration being 23rd September 2024. The last date for submission is 31st December 2024. This competition aims to design astronomy-themed experiments for undergraduate and postgraduate laboratories in institutions of higher education, including engineering institutions. Ongoing experiments may also be submitted for consideration. It could be in any area of astronomy, astrophysics or engineering aspects. The competition is open to individual faculty members/ demonstrators/ scientific assistants involved in either college or university-level teaching. Nineteen entries were submitted of which fourteen have been selected to participate in the competition.

Office of Astronomy for Education (OAE) Center - India

Activities undertaken by OAE Center - India

1. **Objective: Professionalize astronomy education**

The OAE, India Center assisted the IUCAA SciPop team in organizing a Teachers' Training workshop on the campus during August 23-24, 2024. The workshop was attended by thirty teachers from rural areas in the state and comprised lectures, hands-on activities, and sky observations. A lecture on the lifecycle of stars was delivered during the program.

2. **Objective: Provide access to good resources**

Resource Translations

OAE Center - India undertook the English translation of the Marathi book titled 'Khagol Goshthi'(on positional astronomy). The Center completed the

review of the Marathi version of the book 'Big Ideas' and plans to print copies for distribution in the schools.

Distribution of Resources:
The OAE Center - India team has created user guides for the books 'Big Ideas in Astronomy', 'Khagol Goshti', and 'Jantar Mantar' to assist the teachers in using the books effectively in class. The Center has distributed approximately 100 sets of Marathi books in the schools. They have received a request for three hundred books which is in the process of distribution.

3. Objective: Promote astronomy in curricula

The OAE Center - India conducted a baseline survey for the status of astronomy education throughout the country over the last year and the manuscript based on the results is currently under peer review. The OAE Center - India is working on the analysis of the survey data to investigate the differences in astronomy education among different states of India. The preliminary results show there is a large variance in the understanding of astronomy concepts and the availability of resources among the states. The Center also conducted a public astronomy survey during the Science Day activities over the past two years. The data analysis will help understand the public perception of astronomy and prepare a manuscript on the same.

4. Objective: OAE Networking

The OAE Center - India assisted in the organisation of the 6th SHAW IAU workshop (A virtual international workshop held from November 12 - 15, 2024). Also, as a part of the Astronomy Education Research Scientific Organizing Committee, the OAE Center - India team reviewed the submitted abstracts and helped to create the program. The Center also volunteered for the JWST session of the workshop.

Public Outreach Activities

The redesigned website of the IUCAA Public Outreach Programmes was made live in August 2024. It can be accessed via the URL - https://scipop.iucaa.in/

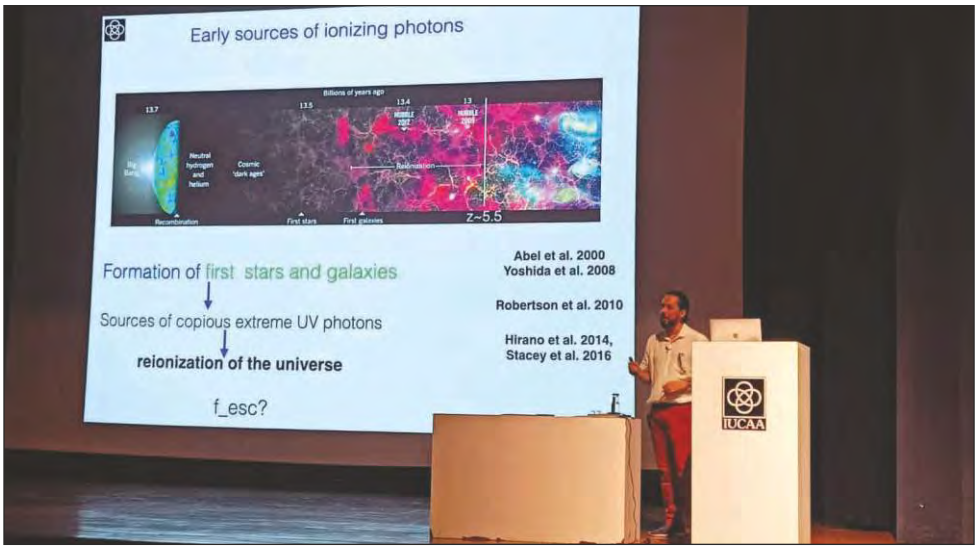
National Space Day celebrations

IUCAA conducted and collaborated on various outreach events across the country to celebrate the first nationwide Space Day. Samir Dhurde delivered two talks titled 'India and Space Astronomy' at IIT, Dhanbad on August 21, 2024, and 'Space Astronomy' for teachers at the State Council for Educational Research and Training (SCERT), Bihar.

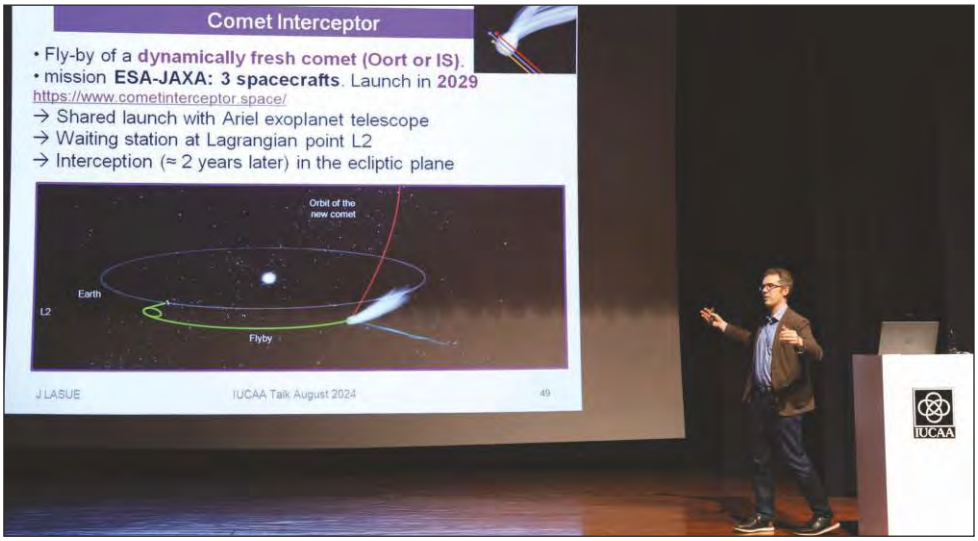
A National Space Day exhibition was organized for school and college students in collaboration with the Department of Physics, SPPU on August 23, 2024.

Chandra Public Lectures

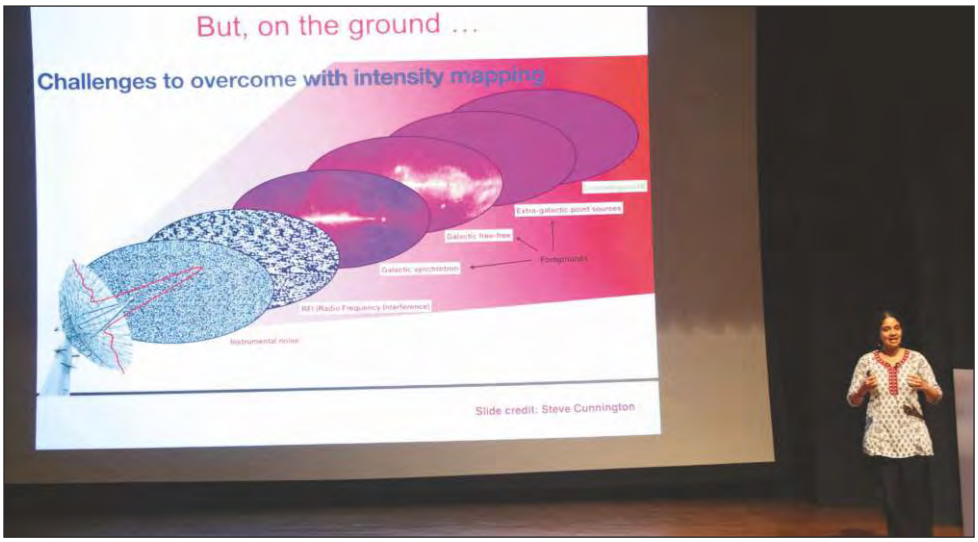
The Public Talk series at IUCAA has been renamed "Chandra Public Lectures" to honour Prof. Subrahmanyan Chandrasekhar, whose name is also given to the venue, the Chandrasekhar Auditorium. The following talks were conducted.



1. *August 23, 2024. Talk by Kanak Saha titled 'Exploring the Cosmic Re-ionization with India's AstroSat'*



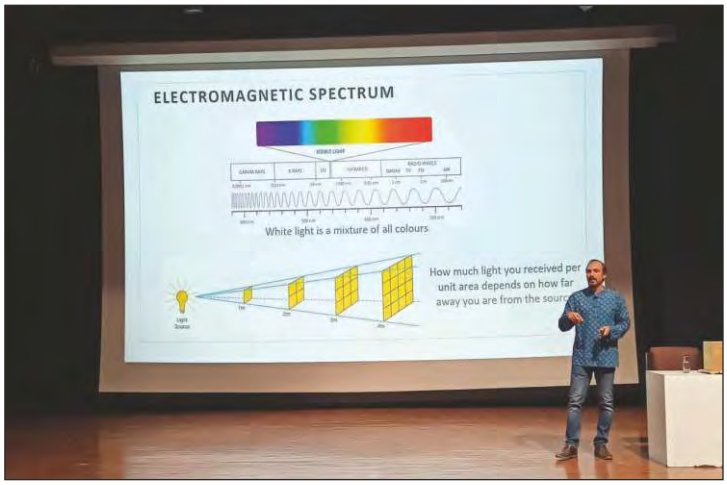
2. *August 29, 2024. Talk by Jérémie Lasue (IRA, France) titled 'The European Space Exploration of Comets: from Giotto to Comet Interceptor'*



3. *September 26, 2024. Talk by Hamsa Padmanabhan (University of Geneva) titled, "Mapping The First Billion Years: Secrets from our Invisible Universe"*

2nd Saturday Lecture / Demos

A fresh round of the 2nd Saturday lecture/demonstration was initiated with the new school academic session:



July 13, 2024 "Decoding our Universe through Spectroscopy" by R. Srianand [English]

August 10, 2024 "Exploring Habitability and Our Sun" by Sneha Pandit [English & Marathi]

September 14, 2024 "Cosmic Dawn: Birth of First Stars" by Atrideb Chatterjee [English]

Regular Workshops, Visits and other outreach events:

July 18-19, 2024: Teachers workshop for Maratha Vidya Prasarak Samaj, Nashi. Twenty teachers participated in this basic astronomy workshop.

July 26 - 27, 2024: Telescope-making workshop at JRD School, Akola. Fifty students and five teachers participated in the workshop.

13 August 2024: Telescope-making workshop at Shiv Nadar Schools, New Delhi. Thirty students and five teachers participated in the workshop.

August 23 - 24, 2024: Rural teachers workshop at IUCAA. Thirty teachers from the rural area of Ambegaon taluka participated in this two-day residential event.

September 03, 2024: Science toys workshop for Euro School, Wakad. Eighty-three students and six teachers attended the workshop.

September 12, 2024:
Science toys workshop for the Hill Green School, Undri.
One hundred and two students and four teachers attended the workshop.

September 19, 2024:
Special interactions for D.Y. Patil College Astronomy Club, PCMC.
Twenty-five engineering students participated in the workshop.

September 22, 2024:
Telescope-making workshop for school students at IIT (ISM), Dhanbad.
Thirty students and 10 teachers attended this workshop.

September 27, 2024: Science toys workshop for Zilla Parishad school teachers at IUCAA. Two hundred and seventy zilla parishad teachers attended this workshop with support from the Akanksha Foundation.

[The above sessions had various members of the IUCAA Scipop Team as organizers or resource persons.]

In-reach (for IUCAA members)

A special session on DIY Spectroscopy was initiated by Debarati Chatterjee and Samir Dhurde and conducted by the Scipop team for IUCAA-NCRA Graduate School students on 19 September. This gave them hands-on experience in making low-cost, effective spectroscopes and using them to look at real spectra. The 16 students who participated in the session also became aware of the IUCAA outreach programmes and expressed interest in participating.

Visitors

[July - September 2024]

Shamim Akhter, Musavvir Ali, Kalyani Bagri, Samuzal Barua, Naseer Iqbal Bhat, Soumya Bhattacharya, Subhra Bhattacharya, Sree Bhattacherjee, Gautam Bhuyan, Promila Biswas, Ritabrata Biswas, Samrat Biswas, Sujay Kr. Biswas, Hritwik Bora, Himakhi Borah, Aniruddha Chakraborty, Nand Kumar Chakradhari, Nabajit Chakravarty, Hum Chand, Krishan Chand, Tej Chand, Amom Lanchenbi Chanu, Suchismito Chattopadhyay, Pranjal Chaturvedi, Suraj Kumar Chaurasia, Madhurima Choudhury, Tanmoy Chowdhury, Pratik Dabhade, Mamta Dahiya, Pravat Dangal, Satyapriya Das, Sushmita Deb, Sanmesh Manish Deshmukh, Shishir Deshpande, Parmeshwar Dewangan, Ruchika Dhaka, Payaswinee Dhoke, P.P. Divakaran, Johann Fernandes, Romanshu Garg, Sushama Ghodmare, Srotoshi Ghosh, Sumit Ghosh, Surajit Ghosh, Sushant G. Ghosh, Keshav Godani, G.K. Goswami, T.R. Govindarajan, Ranjan Gupta, Sandip Haldar, Disha R Hegde, Hereita Herman, Anikul Islam, Venu Jangam, Solai Jeyakumar, Akhila K., Anil Kakodkar, Sammi Kamal, Praveen Kangjam, G.S. Khadekar, Vikram Khaire, Pema Khandu, Ram Kishor, Dawood Kothawala, Debasish Krishnatreya, Ritish Kumar, H. Lalthantluanga, Jeremie Lasue, Miron Livny, Rachel Lynn Lombardi, Premchand Mahapatra, Siddharth Maharana, Zahoor Ahmad Malik, Goutam Mandal, Samir Mathur, Priya Mehra, Parita Mehta, Shubham Mehta, Irom Ablu Meitei, Kyle Francis Miller, Bibhu Prasad Mishra, Sneha Prakash Mudambi, Pranamita Mukherjee, Samanwaya Mukherjee, Subhasis Nalui, Tenzin Namsey, Prasia P., Sreebala P.S., Hamsa Padmanabhan, Main Pal, Subhajit Pal, Kunj Panchal, Divya Pandey, Sanjay Pandey, Uma Papnoi, Lalit Pathak, Pravin Patole, Subhankar Patra, Geetha Paul, Devraj Pawar, Ninan Sajeeth Philip, Anirudh Pradhan, Arbind Pradhan, Chetan Prakash, Naeem Ahmad Pundeer, Anagha R., Dhatri Raghunathan, Gitanjali Erassery Rajulal, Divya Rana, Yashwanta Rao, Divya Rawat, Saibal Ray, Mary Regi, Michael Rutkowski, Sonali Sachdeva, Mohit Raj Sah, Anirban Saha, Sanjay Kumar Sahay, Pragati Sahu, Mohammad Sajid, Prasant Kumar Samantray, Subrata Sarangi, Anish Sarkar, Shiv Sethi, Aishawnnya Sharma, Himanshu Sharma, Paryag Sharma, Sherehan Shehata, Ashish Shokeen, Malay Shukla, Anoop Singh, Gyan Prakash Singh, H.P. Singh, Saikhom Johnson Singh, Suprit Singh, T.P. Singh, Bikash Kumar Sinha, Sagar Soni, S. Sridhar, Sree Suswara, Hitesh Tanenia, Javaid Ahmad Tantray, Gregory Gardener Thain, Prashant Thakur, Praveer Tiwari, Suraj Verma, Aditya Vijaykumar, Priyanka Vyas.

Khagol (the Celestial Sphere) is the quarterly bulletin of IUCAA

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