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NATIONAL SCIENCE DAY

The National Science Day was celebrated on February 28, 2015 with wonderfully characteristic zest and adeptness by all at IUCAA. The institute worked on the weekend to welcome the seven and a half thousand visitors estimated to have been at IUCAA during the celebrations.

To kick off the events, several competitions for the rural students of the Ambegaon Taluka were organised on February 7. IUCAA conducted a science quiz along with essay writing, story writing and drawing. Shabbir Shaikh, Bhooshan Gadre and Anuradha Gupta from the academics, along with the Public Outreach personnel enthusiastically encouraged students from twenty five rural schools competed at the venue generously provided by the New English School, Landewadi. A lot of help received from IUCAA Girawali Observatory staff, Nilesh Pokharkar along with others has been acknowledged.

On February 21, about 500 students from 75 schools in Pune city responded to IUCAA's invitation and participated in another set of inter-school competitions, conducted at IUCAA campus. Students from classes VIII to X took part in the drawing, essay, poetry and science quiz competitions. Aseem Paranjpye gave an interactive talk to the teachers. After the finals of the quiz, all winning students received their prizes from Kandaswamy Subramanian. The overall best school performance trophy went to the rural New English School, Landewadi, which won 3 prizes in all.

The National Science Day on February 28 itself was the main attraction when IUCAA welcomed visitors for an Open Day. They were welcomed and guided through the various displays while they discovered the wonders of the Universe. Various programmes were arranged with voluntary contributions from IUCAA staff and family as well as many students and amateur astronomers from across the city.

In view of the year 2015 being declared as the International Year of Light and Light-based Technologies by the United Nations, there were many special attractions. The lecture halls, Bhaskara 1 and Bhaskara 2 had continuous experiments demonstrating various aspects of Optics and Spectroscopy, put together by the IUCAA labs. Members of the IUCAA-NCRA Radio Physics Laboratory highlighted concepts of Radio Astronomy in the foyer outside Bhaskara 2. A special set of light related films, coordinated by Santanu Das and experiment demos coordinated by Ashok Rupner and Manish Jain kept people rooted in the Chandrasekhar Auditorium during the

Contents...

Congratulations to ...

Aseem Paranjape, on being selected for ***Ramanujan Fellowship*** from Department of Science and Technology, New Delhi.

morning. These were followed by special and touching talks on "Life of an Astronomer" by Varun Sahni and Anuradha Gupta, on "Great Projects in Astronomy" by Ajit Kembhavi, and an evening lecture titled "Seeking N-Ligthenment" by Arnab Bhattacharya from TIFR, Mumbai.

More than 20 spectacular posters, introducing general Astronomy and the related work done at IUCAA, were put up by the Research Scholars and Post-doctoral Fellows. These drew a big crowd. Two Marathi, one Hindi and an English popular talks were given respctively by Bhooshan Gadre, Shabbir Shaikh, Anuradha Gupta and Kaustubh Waghmare in the lecture hall, Bhaskara 3. There was also a live interaction, coordinated by Samir Dhurde, in which Jayant Narlikar and Ajit Kembhavi answered various Astronomy related questions from the public.

Details of the large projects that IUCAA is involved in were showcased in a poster display in the Chandrasekhar Auditorium foyer. These were explained by volunteers of Jyotirvidya Parisanstha along with their own well-prepared models. A telescope making information booth, and posters on Astrophotography were put up by the Akashmitra group. Winners of the IUCAA Model Making competition put up their Mars Rover model.

Arvind Gupta gave wonderful explanations of various science experiments developed at the Muktangan Vidnyan Shodhika to a large crowd in a pandal put up in the Science Park. The many science models located in the Science Park were renovated by Maharudra Mate and explained by groups led by Chetan Bavdhankar. Forty college students volunteered, and were trained to showcase the scientific contributions of the four great scientists, whose statues are part of the IUCAA Kund, and to explain the principles behind the Foucault pendulum Revati and Kshitija Angaluri put up a special exhibit about the Sun and Solar System. Some NGOs put up stalls to introduce people to various science books and educational resources.

People enjoyed the day as the temperatures were kept low due to clouds. This also prevented the evening sky show.

Winners of the Rural Competitions

Science Quiz

1st - Rutuja Yadav Chaskar
Suyash Mangesh Wagh
Aditya Pravin Pokharkar
from New English School, Landewadi.

2nd - Digvijay Suresh Jarkad
Anuja Raju Jadhav
Prachi Nilesh Sanas
from Vidya Vikas Mandir, Awasari (Bu).

3rd - Anuja Suresh Modhave
Akshay Yayati Kedari
Adesh Rakhamaji Shide
from Hutatma Babu Genu Vidyalaya, Mhalunge Padwal.

Essay Writing

1st - Shreyas Suryakant Joshi
from Vidya Vikas Mandir, Awasari (Bu).

2nd - Priyanka Bharat Lande
from Shri Shivajirao D. Adhalrao Patil Vidyalaya, Landewadi.

3rd - Akanksha Devram Kadale
from Shri Muktai Prashala, Pimpalgaon (Khode).

Drawing

1st - Sakshi Subhash Kale from New English School, Ghodegaon.

2nd - Samira Rafiq Sutar from Mahatma Gandhi Vidyalaya, Manchar.

3rd - Pratiksha Sharad Vishwasrao from Kamlaja Devi Madhyamik Vidyalaya, Kalamb.

Story Writing

1st - Ajay Baban Kengale from Shasakiya Madhyamik Ashram Shala, Rajpur.

2nd - Mansi Balasaheb Nighot from New English School, Landewadi.

3rd - Neha Prakash Jadhav from Vidya Vikas Mandir, Awasari (Bu).

Winners of Model Making Competition

1st Prize Team : Shubham Kulkarni and Chaitanya Kulkarni, from Sinhgad College of Engineering, Pune.

2nd Prize Team : Aadi Bhure and Sandesh Bhure, fromNew India High School, Pune.

Winners of the Urban Competitions

Science Quiz:

1st - Neel Gokhale
Aryan Mandar Wadhavekar
Chinmay Jaggannath Chavadekar
from Symbiosis Secondary School.

2nd - Amogh Ratnaparkhi
Yudhishthir Lokhande
Rashika Jashi
from Army Public School.

3rd - Tulika Bannerjee
Medha Kumar
Shardul Vaidya
from Delhi Public School.

Essay Writing : Marathi

1st - Radhika Rajesh Potdar
from Abhinav Vidyalaya High School (Marathi Medium).

2nd - Shubham Ravindra Mahajan from Jnana Prabodhini Navnagar Vidyalaya (M).

Essay Writing : English

1st - Pradnyee Parthesh Kantak
from Abhinav Vidyalaya High School (English Medium).

2nd - Parvathi Rajan, from Kendriya Vidyalaya, RHE.

Drawing :

1st - Sonali Sudam Kokate
from Nutan Marathi Vidyalaya Girls' High School and Jr. College.

1st Prize - Drawing Competition (Urban)

2nd Prize - Drawing Competition (Urban)

2nd - Tanaya Dhananjay Bapat, from Vidya Bhavan High School.

3rd - Vaidehi Reddy, from Army Public School.

Poetry Writing : English

1st - Ameya Atul Sajgure
from Abhinav Vidyalaya English Medium High School.

2nd - Avanti Mahadeo Deval
from Dr. Kalmadi Shamarao High School.

3rd - Bhagyasree V.
from Delhi Public School.

Poetry Writing : Marathi

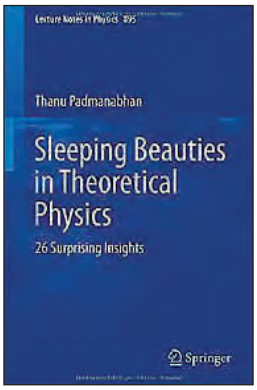
1st - Shruti Suhas Varode
from Ahilyadevi High School for Girls.

2nd - Amruta Rajaram Khune
from Huzurpaga Katraj Madhyamik School.

3rd Prize - Drawing Competition (Urban)

CLOUDY Workshop

IUCAA will organize a workshop on Simulating Photoionised Plasmas with Cloudy, during September 21 - 26, 2015. The workshop will cover observations, theory, and apply Cloudy to a wide variety of astronomical environments, including the Interstellar Medium, AGB Stars, Active Galactic Nuclei, Starburst Galaxies, and the Intergalactic Medium. The lectures and hands-on sessions will be carried out by Gary Ferland, with help from young researchers. The sessions will consist of a mix of textbook study, using the book, **Osterbrock and Ferland, Astrophysics of Gaseous Nebulae and Active Galactic Nuclei**, and application of Cloudy. Participants will be grouped into small teams and organized research projects of mutual interest. Young researchers, especially Ph.D. Students and Post-doctoral Fellows from India and abroad, who plan to use Cloudy or want to gain in-depth knowledge of Cloudy should send their application by email to **aocp@iucaa.ernet.in** by **May 21, 2015.** The application should be in pdf format, and contain the applicant's CV and a short (not exceeding one page) write-up of applicant's current research interests. Ph. D. Students should also arrange a reference letter from their advisers to be directly sent to the above e-mail address, to reach before the last date. The number of participants is limited to 35. Selected participants will be informed by June 21, 2015, and they will be provided accommodation on IUCAA campus and meals free of charges. Limited travel support to participants from Indian Universities is also available. For further information, please visit: http://www.iucaa.ernet.in/~cloudy_workshop/index.html.



New Book by T. Padmanabhan

This book by **T. Padmanabhan** addresses a fascinating set of questions in theoretical physics which will both entertain and enlighten all students, teachers and researchers and other physics aficionados. These range from Newtonian mechanics to quantum field theory and cover several puzzling issues that do not appear in standard textbooks. Some topics cover conceptual conundrums, the solutions to which lead to surprising insights; some correct popular misconceptions in the textbook discussion of certain topics; others illustrate deep connections between apparently unconnected domains of theoretical physics; and a few provide remarkably simple derivations of results which are not often appreciated. The connoisseur of theoretical physics will enjoy a feast of pleasant surprises skilfully prepared by an internationally acclaimed theoretical physicist. Each topic is introduced with proper background discussion and special effort is taken to make the discussion self-contained, clear and comprehensible to anyone with an undergraduate education in physics.

A Ground Breaking Ceremony was carried out on January 24, 2015 at IGO, Girawali for the construction of a new building adjacent to the service building, which will have two small telecopes (upto 0.5 metre) on its terrace for studying transient phenomena

Welcome to ...

Swagat Mishra,

who has joined as a Research Scholar.

Farewell to ...

Suprit Singh,

who has joined the Department of Physics and Astrophysics, University of Delhi, as a Dr. D.S. Kothari Post-doctoral Fellow.

Barun Kumar Pal,

who has joined a college in Kolkata, as an Assistant Professor.

Mandar Patil,

who has joined the Institute of Theoretical Physics, Rikkyo University, Tokyo, Japan, as a Post-doctoral Fellow.

Winter School on the Central Region of Spiral Galaxies

Winter school on the Central Region of Spiral Galaxies was organized at IUCAA during January 12 - 23, 2015. This was the first time in the country such a school on galaxy dynamics was organized. There were about 50 participants, of which majority were Indian Ph.D. students, currently working on various topics related to galaxies. The aim of the winter school was to unfold the complex dynamical nature of the central region of spiral galaxies. The school covered a number of topical issues related to the central region of galaxies as well as basic introduction to stellar dynamics. The entire duration of the school was divided into three parts: Preparatory lectures (12 - 13); Main school (14 - 21) and a Symposium (22 - 23). The preparatory lectures were given by Ajit Kembhavi and Kanak Saha. These lectures covered the most basics of galaxy photometry and galaxy dynamics. The primary aim of these lectures were to prepare the student participants to better appreciate the more advanced topics that were covered in the main school. The main school started with the welcome remarks by Ajit Kembhavi, Director, IUCAA. The lectures were delivered by 6 highly experienced researchers in the field of galaxies, and there were about 23 lectures on various topics related to galactic bars, bulges, supermassive black holes, orbital structures in barred and double-barred galaxies, sloshing, and dynamical modeling. The introductory lecture on the subject primarily focused on central region of our Milky Way, and was delivered by James Binney. Besides the lectures, the participants were also given hands-on session on galaxy photometry by Sudhansu Barway and team, and a demo on computing orbits in galaxies by Daniel Pfenniger. In the end, the students (in group) presented their analysis on the surface photometry on a number of galaxies spanning the Hubble Tuning Fork diagram. The school was organized in such a way as to facilitate the participants interacting with the lecturers and exchange scientific ideas. In the last part, a symposium on structure and evolution of galaxies was conducted. The speakers in this symposium were mostly from the winter school participants plus a number of Indian scientists working on galaxies.

Details about the school's scietific programe (lecture notes and videos) are available on the webpage: http://www.iucaa.ernet.in/~galaxies/

ASI Satellite workshop on Multi-wavelength Astronomical Data, Analysis, Visualization and the Virtual Observatory

At present, the volume and quality of astronomical data from various state-of-the-art facilities is unprecedented in history, and these are expected to significantly increase in the next decade. Moreover, it is being understood that significant breakthroughs in our understanding of astronomical sources will require multi-wavelength study across the electro-magnetic spectrum as well as from precise information regarding the temporal behaviour of these sources. This raises new challenges in selecting, visualizing, analyzing and finally interpreting the data, that can only be met through non-conventional techniques, which will require astronomers to have different skill sets than what were traditionally known.

A one-day workshop was held on Multi-wavelength Astronomical Data, Analysis, Visualization and the Virtual Observatory on February 16, 2015, to introduce participants to these challenges and some basic understanding of how they would be met by new analysis and data handling techniques such as those provided by the Virtual Observatory. The introduction was done through real life case studies, where such techniques have been used to solve intractable problems in astronomical data handling leading to important scientific results. These case studies covered examples from different contexts, such as galaxy morphology studies, rare object detection and astronomical classification. There were 35 students from all over India who attended this workshop. The lectures were given by Ajit Kembhavi, S. Barway, Somak Raychaudhury and Divakara Mayya.

The hand-on session was coordinated by Kaustubh Vaghmare.

Workshop on RoboPol and Polarimetry in Astronomy

The RoboPol programme is run by a collaboration of astronomers at the California Institute of Technology, USA; Max Planck Institute for Radio Astronomy, Germany; University of Crete, Greece; Nicolaus Copernicus University, Poland and IUCAA. The primary science programme is a comprehensive monitoring of optical linear polarization in an unbiased sample of about 100 blazars over a period of three years. Other science programmes include magnetic field mapping of galactic molecular clouds, polarimetry of GRB afterglows, X-ray binaries, etc. The RoboPol instrument was designed and built at IUCAA to cater to these diverse science drivers. The instrument was commissioned on the 1.3 m telescope at Skinakas Observatory in Greece in May 2013, and has since been in use for the survey as well as other programmes.

The collaboration members meet twice annually at one of the participating institutes. The fourth one of these meetings was held at IUCAA during January 8-9, 2015. For two days prior to the main collaboration meeting, a workshop on Polarimetry in Astronomy was organized, in which about twenty five astronomers and a handful of students from India participated in addition to the RoboPol collaboration members. The lectures covered polarimetric science and instrumentation, spanning wavelengths ranging from X-rays through optical to radio. There was also an evening lecture on "Cosmology with Microwave Background Radiation" given by Anthony Readhead, who is the Robinson Professor of Astronomy at Caltech and the Director of Owens Valley Radio Observatory. The workshop provided a forum for astronomers employing polarimetric techniques in diverse fields of astronomy to interact and exchange ideas.

Workshop on Solar Astrophysics

IUCAA funded workshop on Solar Astrophysics was organized at the Regional Science Centre and Planetarium, Kozhikode, in collaboration with Providence Women's College, Kozhikode during January 19-20, 2015. The aim of the workshop was to introduce the students of B.Sc., M.Sc., B.Tech. and early Ph.D. to solar astrophysics. The topics presented in

the workshop were: Introduction to Sun, Introduction to Solar Atmosphere, Solar Magnetic Field, Eruptive Phenomenon and Space Weather, Open Problems in Solar Astrophysics, and Upcoming and Current Facilities for Solar Studies, Experimentation with Small Solar Telescope like MEADE's Coronado SolarMax II. The academic programme of the workshop consisted of 11 lectures by three speakers: Durgesh Tripathi (IUCAA), Girjesh Gupta (IUCAA), and B. Ravindra (IIA). On the second day, the participants observed the Sun through Coronado SolarMax II telescope. On the last day, a planetarium show titled "Exploring Universe with Galileo" was screened. A total of 120 students participated in the workshop from different universities, institutes and colleges of Southern India. Around 15 teachers from colleges of Kozhikode also participated in the workshop.

The workshop was coordinated by Jayant Ganguly (Regional Science Centre, Kozhikode), Mini P. Balakrishnan (Providence Women's College, Kozhikode) and Durgesh Tripathi (IUCAA). The workshop was also partially supported by Vigyan Prasar, Government of India.

Workshop on Statistical Applications to Cosmology and Astrophysics

A 4-day Workshop on Statistical Applications to Cosmology and Astrophysics was held at Indian Statistical Institute, Kolkata, during February 10-13, 2015. This was the first of its kind in Indian Statistical Institute, which is an ideal place to build collaboration among physicists and statisticians. The workshop was primarily planned keeping in mind that with the advent of huge amount of data, statistical techniques have become indispensable tools in data analysis in Cosmology and Astrophysics. Along with existing techniques, proposals for novel statistical tools are also coming up in order to fulfill the growing demand of handling the data more efficiently. In this workshop, we tried to focus on three broad aspects: Existing and Emerging Statistical Techniques, Their Applications to Cosmological Data Analysis, and to Astrophysical Surveys. Some specific topics that were also discussed at length include Bayesian and Other Statistical Techniques, Parameter Estimation and Model Selection Algorithm, Cosmic Microwave Background Radiation, Large Scale Structure, Dark Matter, Dark Energy Surveys, 21 cm Cosmology, Gravitational Waves, and Neutrino Astrophysics.

The workshop had to its credit around 100 participants, mostly young researches, and majority of them were doctoral students and fresh post-doctoral fellows working actively in this field in different institutes and universities from all over India. A fraction of advanced masters students were also chosen with a view to groom them as aspiring researchers in this rapidly developing field. There were 13 invited talks, with duration of one hour each, by delegates from different institutes. The invited talks were coordinated in such a way that the programme had one review talk on broad aspect covering almost all facets on one of the above topics, followed by a more technical talk on the same topic. This helped the audience to have a broad perspective on a particular topic and also on recent trends of research in the same field. Additionally, the workshop had provision of 11 contributed talks, 25 minutes each, carefully chosen by the Scientific Advisory Committee from a number of contributions. These were found particularly suitable for the theme of the workshop and the young speakers presented some interesting ideas and analysis, which could be carried forward. Special stress was on exhaustive discussion session at the end of each day for around one hour, which was very lively, encouraging and leading to possible future collaboration.

From the feedback and enthusiasm of the audience, we believe that the workshop was a success as it had provided a good opportunity to get them enlightened with these active areas, interact with them and with the experts, discuss about the opportunities in this field and build possible collaborations. The organizers of the meeting were Supratik Pal (ISI, Kolkata) and Tarun Souradeep (IUCAA).

Workshop on Introductory Astronomy and Astrophysics

During March 13 - 14, 2015, the Department of Physics, Jagannath Barooah College, Jorhat, Assam organized an IUCAA sponsored Workshop on Introductory Astronomy and Astrophysics (WIAA-2015), as a part of the activities of IUCAA Tezpur University Centre, Assam. The workshop was intended for graduate and post-graduate students, research scholars and college/university teachers, who are working in the area of astronomy and astrophysics. Notably, the workshop proved to be very useful, especially for the final semester graduate (6th Semester, B.Sc. Physics) students of Dibrugarh University, as there is an optional paper on astrophysics in their course structure. The number of participants for the workshop was 72, and the workshop was coordinated by Ranjeev Misra (IUCAA) and Ankur Gogoi (J. B. College, Jorhat, Assam). The workshop covered a number of topics (e.g., Our Universe, Basic Astronomy and Stars, Black Holes in the Universe, Light Scattering by Interstellar Dust, Introduction to Infrared Astronomy, Dusty Universe, Gamma Ray Bursts and Radiative Processes in Astrophysics). The lectures were delivered by Ranjeev Misra (IUCAA), Gazi A. Ahmed, Amit Pathak, Rupjyoti Gogoi (all three from Tezpur University, Assam), and Priya Bharali (GIMT, Guwahati, Assam).

Workshop on Cosmology with Large Scale Structures

The Workshop on Cosmology with Large Scale Structures, was held at the Centre for Theoretical Physics, Jamia Millia Islamia, (JMI) New Delhi, during January 5 -9, 2015 sponsored jointly by IUCAA and JMI. Assem Paranjape, Raghunathan Srianand and Kandaswamy Subramanian from IUCAA, Tirtankar Roy Choudhury of NCRA, T. R. Seshadri of Delhi University, Alex Refregier from ETH, Zurich, and M. Sami of CTP, JMI gave the lectures. The topics covered included an Introduction to Background Cosmology, Observational Probes of the Universe, Weak Lensing, Density Perturbations, Large Scale Structure Formation, Cosmology with 21-cm, and Theoretical Issues with Cosmological Constant. There were about 60 participants from all over India, including local participants. Two special talks on upcoming large observing facilities, TMT and SKA were also arranged. Also, there were a few talks by the participants on their research.

R. Srianand of IUCAA and Anjan A. Sen of CTP, JMI coordinated this workshop.

Colloquia

08.01.2015

Surhud More on ***Cosmological constraints from the Sloan Digital Sky Survey III Galaxies.***

22.01.2015

Lucas M. Macri on ***The Hubble constant in the era of precision cosmology.***

05.03.2015

Dharam Vir Ahluwalia on ***Connections in physics: Spacetime, dark matter, and beyond.***

Seminars

02.01.2015

Sandipan Sengupta on ***Topological parameters in classical and quantum gravity.***

07.01.2015

Anupreeta More on ***Space warps: Crowd sourcing the discovery of gravitational lenses.***

12.01.2015

Iossif Papadakis on ***X-Ray variability of AGN - techniques, results and interpretation - I***

13.01.2015

Iossif Papadakis on ***X-Ray variability of AGN - techniques, results and interpretation - II***

14.01.2015

Iossif Papadakis on ***X-Ray variability of AGN - techniques, results and interpretation - III***

27.01.2015

Milan Bogosavljevic on ***(re)Starting observational astronomy - Challenges and lessons learned in Serbia.***

11.02.2015

Krishna Mohan Parattu on ***Principle of least action for GR in the presence of null boundaries.***

12.02.2015

Kinjalk Lochan on ***Inertial non-vacuum states viewed from the rindler frame.***

26.02.2015

Suvodip Mukherjee on ***Probing isotropy violated cosmic microwave background with bicep and planck.***

04.03.2015

Prasanta Bera on ***Mass–radius relation of strongly magnetized white dwarfs.***

12.03.2015

Sumanta Chakraborty on ***A quantum peek inside the black hole event horizon.***

12.03.2015

Sumanta Chakraborty on ***Quantum fields inside black hole event horizon : Peeking of energy density.***

18.03.2015

Kaustubh Vaghmare on ***Finding optical counterparts to Rosat X-ray sources.***

26.03.2015

Hamsa Padmanabhan on ***Measuring the temperature of the high-redshift universe.***

26.03.2015

Pavan Kumar Aluri on ***Measuring velocity boost due to our local motion from a masked/partial CMB sky.***

IUCAA Preprints

IUCAA preprints released during January - March can be obtained from the IUCAA library (library@iucaa.ernet.in). The preprints can also be freely downloaded from http://www.iucaa.ernet.in/~library/main.html.

Visitors (January- March 2015)

Ahmadjon A. Abdujabbarov,
P. Abhiramnath,
Sheelu Abraham,
D.V. Ahluwalia,
Bobomurat Ahmedov,
Moumita Aich,
Mohd. Shah Alam,
Mohd. Amir,
Deepika Ananda,
Emmanouil Angelakis,
Arun Kumar Aniyan,
Ligeia Aranguiz,
Abhay Ashtekar,
Kalyani Bagri,
Avrajit Bandyopadhyay,
Ravinder K. Banyal,
Sudhanshu Barway,
Soumen Basak,
Prasad Basu,
Jhumpa Bhadra,
Mohit Bhardwaj,
Naseer Iqbal Bhat,
K. G. Biju,
James Binney,
Dmitry Blinov,
Milan Bogosavljevic,
Janesse Brewer,
Koushik Chakraborty,
Subenoy Chakraborty,
Luke Chamandy,
Ramesh Chandra,
Sunil Chandra,
Suresh Chandra,
Rajdeep Chatterjee,
Subhamoy Chatterjee,
Goutami Chattopadhyay,
Surajit Chattopadhyay,
Tanuka Chattopadhyay,
Soumini Chaudhury-Chatterjee,
Jai Verdhan Chauhan,
Laxmikant Chaware,
Arnab Rai Choudhuri,

Aditya Chowdhury,
Sukanta Das,
Aritra De,
Soumi De,
Ujjal Debnath,
Reetika Dudi,
Jibitesh Dutta,
Savithri Ezhikode,
Indu G. ,
Dimitri Gadotti,
Sharad Gaonkar,
Michelle George,
Avyarthana Ghosh,
Rahul Ghosh,
Ritesh Ghosh,
Soumavo Ghosh,
Sushant G. Ghosh,
Sushmita Gogoi,
Maheswar Gopinathan,
Yatee Gupta,
Sourav Haldar,
Mubashir Hamid,
Maria Haney,
Tomohiro Harada,
Mathew Hilton,
M. Honey,
Tanvir Hussain,
Zach Ioannou,
Bala Iyer,
Joe Jacob,
Rinku Jacob,
Sitha K. Jagan,
Sanjay Jhingan,
Naveen Jingade,
Chanda Jog,
Sharda Keshav Jogadand,
Reju Sam John,
Dhanya Joseph,
Kanti Jotania, Karamveer Kaur,
G.S. Khadekar,
Preeti Kharb,
Rubinur Khatun,
Andrew King,
Ravi Kuchimanchi,
Parveen Kumar,
Pravir Kumar,
Vishal Kumbhar,
Ioannis Liodakis,
Witold Maciejewski,
Lucas Macri,
Ashish Mahabal,
Soma Mandal,
Bari Maqbool,
Kishore Marathe,
Tabasum Masood,
Sujay Vivek Mate,
Hameeda Mir,
Ishan Mishra,
Arpita Misra,
Dhrubaditya Mitra,
Aditya Sow Mondal,
Anupreeta More,
Surhud More,
Pramod G. Musrif,
Sindhu N.,
Rathnasree Nandivada,
Biman Nath,
Nilam Navale,
Prasanta Kumar Nayak,
Rahul Nigam,
Ryan J. Oelkers,
Geoffrey Okeng'o,
Alain Omont,
Vaidehi Sharan Paliya,
Bimal Pande,
Seema Pande,
Vihan Pandey,
Mamta Pandey-Pommier,
P. N. Pandita,
Virginia Georgia Panopoulou,
Iosif Papadakis,
Dhruv Paranjpye,
Abhishek Parida,
Shankar Dayal Pathak,
Biswajit Paul,
Surajit Paul,
Devraj Pawar,
Pramod Pawar,
Patrick Petit- Jean,
Daniel Pfenniger,
Ninan Sajeeth Philip,
Khun Sang Phukon,
G.V. Punyakoti,
Manoj Puravankara,
Farook Rahaman,
Pritesh Ranadive,
Chayan Ranjit,
Sujata Kundu Ranjit,
Swara Ravindranath,
Katherine Rawlins,
Saibal Ray,
Subharthi Ray,
Somak Raychaudhury,
Anthony Readhead,
B. Eswar Reddy,
Arpita Roy,
Prabir Rudra,
Aswathy S.,
Sonali Sachdeva,
P. C. Sachin,
Rajib Saha,
Sunder B. Sahayanathan,
Shishir Sankhyayan,
Kartick Sarkar,
Subrato Sarkar,
Sujan Sengupta,
Aishawnnya Sharma,
Neha Sharma,
Prateek Sharma,
Pankaj Sheoran,
Passang Lhamu Sherpa,
H.P. Singh,
K.P. Singh,
Akshat Singhal,
Archana Soam,
Vikram Soni,
Gordon Squires,
S. Sridhar,
C.S. Stalin,
S. Sudhagar,
Avinash Surendran,
Swetha T.,
Pablo Reig Torres,
Pranjal Trivedi,
Anurag Tyagi,
Paniveni Udayashankar,
Chandra Babu,
Savin S. Varghese,
Hum Chand Varma,
Mahendra Verma,
Gururaj Wagle,
Hsiang Hsu Wang,
Naveel Wani,
Bal Krishna Yadav,
Jyotsna.

Visitors (Expected)

April 2015

Sandip Bhattacharya, B.M. Birla Planetarium, Jaipur; **H.B. Bohidar,** Jawaharlal Nehru University, Delhi; **Raghavendra Chaubey,** Banaras Hindu University, Varanasi; **Shankar Prasad Das,** Jawaharlal Nehru University, Delhi; **Jishnu Dey,** Presidency University Kolkata; **Mira Dey,** Presidency University, Kolkata; **K Indulekha,** Mahatma Gandhi University, Kerala; **Sitha K. Jagan,** University of Calicut, Kerala; **K. Jeena,** Providence Women's College, Kerala; **Reju Sam John,** University of Pondicherry; **Umesh C. Joshi,** Physical Research Laboratory, Ahmedabad; **Arkopriya Mallick,** Jadavpur University, Kolkata; **Titus K. Mathew,** Cochin University of Science and Technology, Kerala; **Kishor D. Patil,** B.D. College of Engineering, Wardha; **Rajagopal,** Cochin University of Science and Technology, Kochi; **Sridharan Rengaswamy,** European Southern Observatory, Chile; **Sebastian Seehars,** ETH, Zurich, Switzerland; **Banashree Sen,** Jadavpur University, Kolkata; **Kiran Shanker,** University of Allahabad; **K.P Singh,** Tata Institute of Fundamental Research, Mumbai; **D. B. Vaidya,** Ex-Gujarat College, Ahmedabad; and **Bupinder Zutshi,** Jawaharlal Nehru University, Delhi.

May 2015

Bijan Kumar Bagchi, University of Calcutta, Kolkata; **Sarmistha Banik,** BITS-Pilani, Hyderabad; **Subenoy Chakraborty,** Jadavpur University, Kolkata; **Ritaban Chatterjee,** Presidency University, Kolkata; **Suchetana Chatterjee,** Presidency University, Kolkata; **Sunil Choudhary,** New Delhi; **Dhurjati Prasad Datta,** University of North Bengal, Darjeeling; **Ujjal Debnath,** Indian Institute of Engineering Science and Technology, West Bengal; **S. Dev,** H.N. Bahuguna Garhwal Central University, Uttarakhand; **Broja Gopal Dutta,** Y.S. Palpara College, West Bengal; **Sushant Ghosh,** Jamia Millia Islamia, New Delhi; **Prithish Halder,** Assam University Silchar; **K.P Harikrishnan,** The Cochin College, Kochi; **S. N. A. Jaaffrey,** M.L Sukhadia University, Udaipur; **Joe Jacob,** Newman College, Kerala; **Kanti Jotania,** M.S. University of Baroda, Gujarat; **Nagendra Kumar,** M.M.H. College, Ghaziabad; **Suresh Kumar,** BITS-Pilani, Rajasthan; **Badam Singh Kushvah,** Indian School of Mines, Jharkhand; **Soma Mandal,** Taki Govt. College, West Bengal; **Soumen Mondal,** Ramakrishna Mission Residential College, West Bengal; **Rajesh Kumble Nayak,** IISER, Kolkata; **Shantanu Rastogi,** D.D.U. Gorakhpur University, Uttar Pradesh; **Sanjay K. Sahay,** BITS-Pilani, Goa; **Sanjay Sarwe,** St. Francis De Sales College, Nagpur; and **Somasri Sen,** Jamia Millia Islamia, New Delhi.

June 2015

Prasad Basu, National Institute of Technology, Sikkim; **Archana Bora,** Gauhati University, Guwahati; **Mamta Dahiya,** SGTB Khalsa College, Delhi; **Rupjyoti Gogoi** , Tezpur University, Assam; **Sarbari Guha,** St.Xavier's College, Kolkata; **Bhola Ishwar,** BRA Bihar University, Muzaffarpur; **Ram Kishor,** Central University of Rajasthan, Ajmer; **Nishant Mittal,** Meerut College; **Hemwati Nandan,** Gurukula Kangri University, Uttarakhand; **Amit Pathak,** Tezpur University, Assam; **Bikash Chandra Paul,** North Bengal University, West Bengal; **Anirudh Pradhan,** GLA University, Uttar Pradesh; **Joginder Sharma,** Meerut College; **Parijat Thakur,** Guru Ghasidas Central University, Bilaspur; **Anisul Ain Usmani,** Aligarh Muslim University, Uttar Pradesh; and **Ayanda Zungu,** University of Kwazulu-Natal, South Africa.

Samrat Yantra Calibration during ASI - 2015

The Astronomcial Society of India and IUCAA jointly conducted a school-level exercise for calibration of the Samrat Yantra (Sun Dial) in the Science Park on February 18, 2015 in tandem with the annual ASI meeting in Pune. Rathnasree Nandivada, Director, Nehru Planetarium, Delhi and also the chairperson of the ASI outreach committee, was the special resource person, who conducted the calibration.

Thirty students from different schools participated in the event. The participants were from classes 8 and 9. The event included an introduction to the Samrat Yantra, learning time measurements using it and then the calibration. Students used simple equipment like a measuring tape, and a clock showing IST to make observation tables with time difference in the correct time and the time difference for that shown by markings on the dial. Using error analysis, students calibrated the dial upto 5 minutes of time difference using their observations, on their own.

As an addition, using a metrestick and its shadow on the arc of the sundial at local noon, the students learnt how to calculate the declination of the Sun from the ecliptic on a particular day. Some teachers and parents, who also participated, helped the students, said that it was a fun for all to learn new experiments at IUCAA.

Know Thy Birds 9

Oriental Magpie-Robin

- Chaitanya Rajarshi

Hello friends,

I am sure many of you must have started looking around for birds. I would like to know that how many of you have started capturing birds in your cameras? Not to worry if you don't have an expensive SLR camera. Just use the shutter of your eyes and store the bird images in your brain. However, you can use a binocular for bird watching (Recommended specifications: 8 x 40 or 10 x 50). The first figure refers to the magnification, while the second figure refers to the diameter of the objective lens in mm. They are available from Rs. 2,000/- onwards.

Ok, now about a bird with melodious singing abilities. Please meet Copsychus saularis, Oriental Magpie-Robin, a small and sweet bird common in our surroundings.

Oriental magpie-robin (Dayal in Marathi) Photo courtesy: Deepashri Saraf

It is a typical black and white passerine bird with a long tail that is held upright as it forage on the ground or perch conspicuously. It is about 20 cm long. The male has black upper parts, head and throat apart from a white shoulder patch. The under parts and the sides of the long tail are white. Females have dull dark grey back upperparts and breasts.

It is a resident breeder in most parts of South Asia. They mainly breed from March to July in India. You will find their nests in tree hollows or holes in walls or buildings. They often adopt nest boxes. They lay 3-5 eggs (pale green with some brown spots) and incubate for about two weeks. Oriental Magpie-Robins mainly feed on insects, occasionally take fruits and flower nectar.

In June 2011, I located one nest in IUCAA instrumentation lab premises. There were four chicks (age ~ five days) in the nest. The nest was built between two electric DP boxes on wall at about 8 feet height from ground. Unfortunately, after a few days I found it empty. The chicks fell prey to a domestic cat. I never saw a nest again at that location.

The most common place to see this bird is IUCAA staff parking, usually at dawn and dusk. Also, try to listen to its delightful song and how it imitates the calls of other birds.

How about organizing a bird watching session in our campus. Contact me here: cvr@iucaa.ernet.in

Wish You A Very

Happy Birding

Khagol (the Celestial Sphere) is the quarterly bulletin of

IUCAA

We welcome your responses at the following address:

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