



IUCAA
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Eclipse under the bamboo



Eclipse under the Bamboo

Image Credit & Copyright: *Somak Raychaudhury (Inter-University Centre for Astronomy & Astrophysics)*

Explanation: Want to watch a solar eclipse safely? During the June 21st solar eclipse this confusing display appeared under a shady bamboo grove in Pune, India. Small gaps between close knit leaves on the tall plants effectively created a network of randomly placed pinholes. Each one projected a separate image of the eclipsed Sun. The snapshot was taken close to the time of maximum eclipse in Pune when the Moon covered about 60 percent of the Sun's diameter.

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Introductory Summer School and Refresher Course in Astronomy and Astrophysics

The Introductory Summer School, and Refresher Course in Astronomy and Astrophysics was organized together, by IUCAA during May 11 - June 12, 2020. Due to the unprecedented situation caused by the ongoing COVID-19 pandemic, the lectures and other activities were organized online via the video conferencing platform Zoom, and

were simultaneously broadcasted to YouTube. The Summer School (for college and university students), and the Refresher Course (for college and university teachers) were aimed at introducing Astronomy and Astrophysics as well as to give a flavour of current research topics in the field. The participants were also introduced to the

astronomical facilities available to them in India, and the astronomy-related mega-science projects that India is a part of. In particular, the programme also featured a number of lectures related to the science of gravitational waves and the upcoming LIGO - India facility. The question and answer sessions were handled through Zoom as well as via YouTube.

The participation of the attendants in these activities during the lectures was crucial to the success of the programme, which was advertised to more than 600 participants, who had applied to the Summer School and Refresher Course from different parts of India. The videos of most of the lectures have been made available online for later viewing.

To date, these lectures have garnered about 40,000

views. The entire staff at IUCAA was helpful in the organization of the programme. Santosh Khadilkar took care of the administrative requirements. Divya Rana, a PhD researcher at IUCAA, played an essential role in streaming the programme online.

The Zoom video conferencing technicalities were handled by Santosh Jagade, and Sagar Bhosale from the computer centre. Dhruva Saikia along with the Astronomy Centre for Educators at IUCAA, handled the online questions and answers during the lectures as well as the evaluation of the refresher course participants. Surhud More, Aseem Paranjape, and Nishant Singh were the faculty coordinators. The set of lectures can be found online at <https://tinyurl.com/issa2020-playlist>.

Welcome to ...



Kanaka Raju Pandiri has joined IUCAA as a post-doctoral fellow under LIGO - India project in April 2020. He has obtained his PhD from the University of Electro-Communications, Japan, in 2011.

He worked as post-doctoral researcher at Extreme Photonics Laboratory, RIKEN Center for Advanced Photonics, Japan, during 2011 - 2014. Subsequently, he worked as a post-doctoral fellow at James R. Macdonald Laboratory, Kansas State University, USA, during 2014 - 2019. His primary interest lies in developing

new optical/laser technology, and utilizing it to understand dynamical processes happening in nature.

During his previous post-doctoral positions, he has worked on ultrafast laser technology, and employed it to study dynamics of atomic and molecular processes happening at extremely short time scales (femtosecond). At IUCAA, he is working on training, research and development of optical and opto-mechanical systems that will improve the sensitivity of interferometric gravitational wave detectors.

Farewell to ...

Aishwanya Sharma left IUCAA for personal reasons.

Workshop on Astronomy and Astrophysics



A Workshop on Astronomy and Astrophysics was organized at Srikishan Sarda College, Hailakandi, Assam, during January 22 - 28, 2020, in response to the new syllabus being introduced at the undergraduate level by the Assam University.

There were 30 teachers and students who participated in the workshop, which covered a variety of topics: *Coordinate systems and time, Observational techniques, Stars and stellar evolution, Planetary systems, Galaxies, Introduction to general relativity*

and cosmology, High energy phenomena, and Image processing techniques.

The resource persons were: Himadri Das, Atri Deshamukhya, and Asoke K. Sen (all from Assam University, Silchar), Sukanta Deb (Cotton University, Guwahati), Sanjeev Kalita and Biman Medhi (both from Gauhati University, Guwahati), Gazi Ahmed (Tezpur University), and D. J. Saikia (IUCAA). The workshop was coordinated by Rupam Sen (Srikishan Sarda College), and D. J. Saikia.



Session on Teaching in Astronomy and Astrophysics



A vibrant and informative session on *Teaching in Astronomy and Astrophysics*, sharing experiences, and discussing on how to take this further, was held on February 14, 2020 at IISER - Tirupati, on the occasion of the 38th meeting of the Astronomical Society of India.

There was a mini-session titled: *Voices from the young*, where students Anshuman Borgohain (Tezpur University); Anusree K.G. (Mahatma Gandhi University, Kottayam), Avyarthana Ghosh (IUCAA), and Jaikhomba Singha (IIT - Roorkee) shared their experiences and expectations.

There was another mini-session on *Online courses in Astronomy and Astrophysics*, where Manjari Bagchi

(IMSc, Chennai), Chaitra Narayan (NCRA-TIFR, Pune), Manoj Puravankara (TIFR, Mumbai), and Sarita Vig (IIST, Thiruvananthapuram) shared their experiences and made suggestions. Besides the introductory remarks by Dhruba J. Saikia, and Somak Raychaudhury (both from IUCAA), Nand Kumar Chakradhari (Pt. Ravishankar Shukla University, Raipur), Smriti Mahajan (IISER - Mohali), and Asoke K. Sen (Assam University, Silchar) made short presentations. K. Indulekha (Mahatma Gandhi University), and Priya Hasan (MANU, Hyderabad) also contributed short interventions.



Colloquia
(Online)

- 23.04.2020 *Dipanjan Mukherjee* on *How black holes in the centres of galaxies affect their evolution.*
- 30.04.2020 *Sayantana Banerjee* on *COVID-19: What we have learnt and what we need to learn? - The perspective of an ID physician.*
- 07.05.2020 *Axel Brandenburg* on *Self excited dynamos: Between theory, laboratory, and astrophysical realities.*
- 14.05.2020 *Francoise Combes* on *Active Galactic Nuclei (AGN): Fuelling and feedback.*
- 21.05.2020 *Philp Charles* on *Orbital and super-orbital periods in ULX pulsars and HMXBs.*
- 28.05.2020 *Subir Sarkar* on *Evidence for anisotropy of cosmic acceleration.*
- 04.06.2020 *Ranjeev Misra* on *X-ray variability of black hole systems: The AstroSat advantage.*
- 11.06.2020 *L. Sriramkumar* on *Are bouncing scenarios a viable alternative to inflation?*
- 18.06.2020 *Martin Rees* on *Progress and frustration in cosmology.*
- 25.06.2020 *Gautam I. Menon* on *COVID-19 in India.*

Neem Seminars
(Online)

- 28.04.2020 *Tuhin Ghosh* on *Detection of the warm ionized intergalactic medium in the Planck data using Stack First approach.*
- 05.05.2020 *Subenoy Chakraborty* on *Modified gravity theories and Einstein gravity: An equivalent prescription.*
- 05.05.2020 *Murli M. Verma* on *Dark matter in modified gravity.*
- 16.06.2020 *Bhargav Vaidya* on *Twists and swirls in AGN jets and their impact on emission signatures.*
- 16.06.2020 *Shantanu Desai* on *Line of sight Shapiro delay for photons, neutrinos and gravitational waves.*
- 23.06.2020 *Mamta Gulati* on *Ram pressure stripping and its efficiency to remove gas from galaxies.*
- 30.06.2020 *Sunil Malik* on *Probing magnetic fields in the high-redshift galaxies using rotation measure of quasars.*
- 30.06.2020 *Ankur Gogoi* on *Laboratory simulation of the light scattering properties of interstellar dust analogues.*

Public Outreach Activities

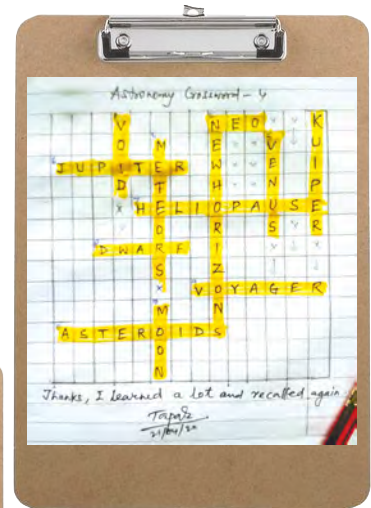
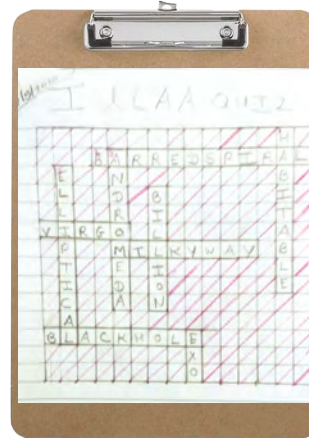
Due to the lockdown that followed the unfortunate situation of COVID - 19 pandemic, IUCAA SciPOP team organised and conducted many activities online to keep the public engaged. Following are the details of the outreach activities:

Astronomy Crosswords

Starting mid-April 2020 to the first-week of May 2020, themed Astronomy Crosswords in English and Marathi were designed and shared with general public once a week, on different social platforms like Facebook, Twitter, and WhatsApp.

The activity received a wonderful response, especially from students and teachers across the country. Some research scholars as well as a few teachers from IUCAA helped in creating Hindi crosswords for Hindi medium students too.

The activity was designed and coordinated by Sonal Thorve (IUCAA).



Story with a Science Toy

A series of stories of 20 scientists, each story followed by a simple toy explaining some related science concept to the story was published during April - June 2020.



The toys and experiments have chosen used the household material. The series was specially designed for primary school students.

It received wonderful responses from such students, sharing the videos and pictures of experiments performed. The activity was designed and coordinated by Shivani Pethe (IUCAA).

Moon Challenge

In order to keep general public occupied with sky related activities during the lockdown, we presented them a "Moon Challenge", in which they have to look at the Moon at least once every day, over one complete lunar cycle of phases, i.e., from one new moon to the next.

The SciPOP team also did this at the same time. Starting April 23, 2020, many people joined in this, and strived to be with us through the whole lunar cycle.

Importantly, many videos were released daily so as to give more information about the Moon and related occurrences in the sky. Several amateur astronomers also joined in by sending their pictures of the Moon during this period, which were an excellent value addition to the effort.

The event was conducted by Samir Dhurde (IUCAA) with the help of Atharva Pathak, and was actively helped with regular telescopic pictures of the Moon by amateur astronomers Revati Dokhe, Anirudh Thakar, and Prabhakaran Kutti.

Zero Shadow Day

To make it a nationwide celebration, a series of short animated videos explaining the concept of Zero Shadow Day in English and Marathi was published in early May 2020. These involved how to observe the zero shadow day using things lying around, and hence to understand the motion of the sun in the sky. General public from different parts of Tamil Nadu, Madhya Pradesh, Maharashtra, Delhi, and Bihar participated, and performed the experiments and shared their experiences with us.



Lectures on Introduction to Astronomy and Astrophysics, and Careers

Astronomy webinars were organised by different schools and colleges, in which Sonal Thorve was invited as a guest lecturer. On May 3, 2020, a lecture was organised by Teach for India, Ahmedabad, for school students. The lecture was on how to learn astronomy by observations of some simple regular celestial objects, and their movements without any aid of a telescope.

On May 17 and May 24, 2020, lectures for engineering and science students were organised respectively by Nutan Maharashtra Institute of Engineering and Technology, Talegaon, and the University of Delhi. Introduction to Astronomy and Astrophysics, and Career Opportunities were discussed during these webinars.

Online Summer Astronomy Camp

School Students' Astronomy Camp was conducted online during June 1 – 6, 2020. Along with the introduction to hands-on astronomy projects, an introduction to upcoming solar eclipse, and how to observe it safely were given. Thousands of people joined us for the camp, and also participated in live Q & A session followed by the video lectures. The camp was coordinated by Sonal Thorve, and was succeeded in reaching about 1,000 students and astronomy lovers.

Sessions on Annular Solar Eclipse Awareness

To spread awareness about the beautiful celestial event, the Annular Solar Eclipse on June 21, 2020, that was to be visible from all parts of India, sessions of webinars were conducted during June 5 – 17, 2020, by IUCAA SciPOP, with support from Vigyan Prasar, New Delhi.

Tushar Purohit (IUCAA) was invited as the resource person.

Contents of the webinars were: (i) How eclipse occurs, by Arvind C. Ranade (Vigyan Prasar), (ii) Methods to safely observe solar eclipse using household material, by Tushar Purohit, and (iii) With a small telescope, by Mukesh Satankar (Bhopal).

About 700 teachers from almost all parts of India, UAE, Qatar, Baharin, and Oman were reached during the 8 sessions of the webinars.





Annular Solar Eclipse

The residents of the IUCAA campus enjoyed the moments of the Annular Solar Eclipse on June 21, 2020, and also the online show put together collaboratively by IUCAA SciPOP and the ASI-POEC.

The webcast probably had the largest single reach by any of IUCAA outreach events with more than 2 lakhs views on the video, as reported by YouTube, and close to 4,600 people watching at the same time during the peak of the event. Experts from diverse sciences like Astronomy, Microbiology, Zoology, and Social Sciences contributed their time, and enjoyed this celebration of the eclipse with us live.

At one point, the directors of three major astrophysics institutes were addressing the audience together - probably another first for an Indian online outreach event.

ANNULAR SOLAR ECLIPSE 2020
JVP, Pune

LIVE

Cosmo Sapient

1:51:58 / 4:00:50

Annular Solar Eclipse, 21 June, 2020 - View Live feeds with Scientists

213,270 views • Streamed live on Jun 20, 2020

1.6K 121 SHARE SAVE

IUCAA SciPOP
5.48K subscribers

ANALYTICS EDIT VIDEO

Up next AUTOPLAY

Top chat replay

- Lupita Santos --*Hello from México*~
- Shaili Devi 🌈
- Jenny If you hit the X you will hide the comment feed
- PRANAY SHAH @saptarshi ISRO is also planning for L5 range too!! am right, what's your view!
- Prashant solanki anyone from qvs delhi
- Atulya Shah anyone from pps
- Atulya Shah anyone from pps
- Alpha Anindita ring of fire in rajasthan
- Oindrila Mukherjee the ring of fire is now visible
- Prabhdial singh xacc
- Shivom Gupta @Nabin Halder As this time it is annular solar eclipse where you see only ring and that because Moon this time is little father from Earth causing an annular solar eclipse. Shivom IUCCA SciPop
- Lia Arakal pov: its midnight and you're trying to find something to entertain you
- suresh singh current scenario
- Oindrila Mukherjee please talk about that

The speakers also explained the event in Indian languages, viz. Marathi, Hindi, Gujarati, Punjabi, Kannada, Bengali, and Malayalam (other than English), which made it a unique and appealing event for the people from various parts of the country.

ANNULAR SOLAR ECLIPSE 2020
Live webcasts, Multilingual Expert panel and QnA
Enjoy #ASE2020 #AstroAtHome with us

LIVE

IIA Hanle
Fujian, China
Taipei, Taiwan

Currently featuring: Prof. Annapurni Subramaniam, Dipankar Banerjee, Prof. Somak Roy Choudhury, Aniket Sule, Samir Dhurde.

3:53:37 / 4:00:50

Annular Solar Eclipse, 21 June, 2020 - View Live feeds with Scientists

213,270 views • Streamed live on Jun 20, 2020

1.6K 121 SHARE SAVE

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5.48K subscribers

ANALYTICS EDIT VIDEO

Up next AUTOPLAY

Top chat replay

- Achieve it with JoJo all these scientists are interacting in such an enthusiastic and energetic manner... we really got inspired by u all 🤖🤖
- Jawahar Raja Thank you so much for this. This was really enjoyable. For someone who grew up hating science, the enthusiasm of the scientists was infectious
- Aishik Bandyopadhyay Thank you.
- Jawahar Raja Hope to now log on to more of your programmes
- Dr. K.M. Garadkar Very good discussion
- Prashant Valluri Awesome work, Indian astrophysicists!
- Zeeshan Khan jawahar...
- Ruturaj Gole I was hoping to hear some Marathi. I am in Canada :(Shouche sir is great.
- Zeeshan Khan Dr KM...
- Gautam Bagul great job 🙌🙌🙌🙌🙌
- SNEHA KUMARI thank you all the pannelisi fir viewing solar eclipse
- Zeeshan Khan naitam 🙌🙌🙌🙌

The most special experience was, of course, being able to enjoy an eclipse ring seen from three places thrice during an hour due to the efforts of many other teams who shared webcasts of their own views.

The audience, from across all ages, was not just from India, but also from our neighbouring countries and other countries across the world. Parts of this webcast were shown live on Doordarshan and several other TV channels, and our social media posts were shared far and wide.

The team for this event had Ishan Shinde and Atharva Pathak working from IUCAA, while Sonal Thorve and Ankit Bhandari from the core team, along with the rest of the SciPOP team were working in the background from their homes. The recording of the event will remain on the IUCAA SciPOP YouTube channel at the link: <https://www.youtube.com/watch?v=JvyHxZN1QcA>.

In addition to this, an amazing photograph of pinhole images of the eclipsed Sun formed in the IUCAA bamboo thicket, clicked by Somak Raychaudhury, was featured on NASA's Astronomy Picture of the day website <https://apod.nasa.gov/apod/ap200626.html>.

Sci-Fi Enterprise

IUCAA SciPOP team organised the 'Sci-Fi Enterprise: An online Science Fiction Story and Poetry Competition amidst lockdown', which was a new and unique initiative to engage the public in science and astronomy.

We received unmatched responses from young and old of 9 to 75 years old general public. With a total of 49 submissions, it was not an easy task to choose a few best, but this job was very well done by our judges (faculty, research scholars, employees and family members of IUCAA), and the same was well-coordinated by Sonal Thorve. Following this, we highlighted all the 7 winners and their creativity for a week, and again we received amazing responses from our audience.

The event was designed and coordinated by Samir Dhurde and Shivom Gupta (both from IUCAA).

Sci-Fi Enterprise was indeed a holistic approach to take our imagination and creativity beyond a regime, where it would inspire both science and science enthusiasts to keep exploring. IUCAA SciPOP hopes to continue organizing such campaigns and competitions in future. One can find winning entries on our Facebook page: fb.me/IUCAAScipop.

To make it inclusive, audio files of the same entries are also published. Audio files of the winning stories and poetries can be found in: <https://soundcloud.com/iucaa-scipop>.

Introduction to the Night Sky

Facebook live sessions of Introduction to Night Sky were organised during June 27 – 28, 2020, by the Explorers Trekking Club, Pune. Tushar Purohit was invited as the resource person. In these sessions, he talked about basics of sky watching and telescope making. Totally, about 3,000 people joined the live sessions in these two days.

Ishan Shinde edited the videos, and has been working on making videos of some special events like shadows observed from different places on a Zero Shadow Day in Pune. Atharva Pathak took care of publicising the events by creating the posts and posters, sharing it via different social media channels.

*All the playlists can be found here: <https://www.youtube.com/c/IUCAASciPOP/playlists>

Visitors

April to June 2020

Sapam Gayatri Devi, Annu Jacob, Ramya Manjunath, Swarnim Shashank, and Varun.

Visitors Expected

Shashi Kanbur, SUNY, Oswego, USA.

Long Term Visitors

Avinash Deshpande, Raman Research Institute, Bengaluru (Visiting Professor); David Hilditch, University of Lisbon, Portugal (Adjunct Faculty); Ashish Mahabal, CALTECH, USA (Adjunct Faculty); Ninan Sajeeth Philip, Artificial Intelligence Research and Intelligence Systems, Kerala (Visiting Professor); and A.R. Rao, Mumbai (Visiting Professor).

Khagol (the Celestial Sphere)
is the quarterly bulletin of



We welcome your feedback at the following address:

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