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25th IUCAA Foundation Day Lecture

The Silver Jubilee Foundation Day Lecture, titled ***"Building Scientific Institutions: The IUCAA Story"***, was delivered by the Founder Director of IUCAA, Professor Jayant Narlikar, on December 29, 2013 in the Chandrasekhar Auditorium. He narrated the development of IUCAA from conception to its Silver Jubilee year. He first described three very well known institutes from which he had drawn inspiration and ideas in the development of IUCAA; these being the Institute of Astronomy, Cambridge, England; Tata Institute of Fundamental Research, Mumbai and International Centre for Theoretical Physics, Trieste, Italy. Professor Narlikar described how IUCAA was set up in 1988 under the guidance and with a great help from Professor Yash Pal, who was then the Chairman of the University Grants Commission. The guiding principle behind IUCAA was the eightfold way which defines the various functions of IUCAA ranging from research to incubation of astronomy in universities to public outreach. He described the construction of the IUCAA buildings, the development of various facilities and programmes, and the march of IUCAA over the years towards excellence in astronomical research. He mentioned the various large projects to be undertaken by IUCAA over the coming years. He ended his talk after expressing the hope that the consequent growth would not adversely affect the ethos of inclusiveness and personal interaction that IUCAA has developed over the first 25 years of its existence.

The lecture was very well attended and there was an interesting question-answer session at the end between Professor Narlikar and the audience.

Gravitational Wave Physics and Astronomy Workshop

The seventeenth ***Gravitational Wave Physics and Astronomy Workshop*** was held at IUCAA during December 17 - 20, 2013. This was the first time that this meeting was held in India, and it brought about 150 delegates from the world over to discuss a range of questions. With an eye on the Advanced Detector Era (ADE), which is set to begin in a couple of years, this year the key questions of interest were: What is the current status and timeline of the various detectors that plan to take data in the ADE? What physics and astrophysics can be extracted from gravitational wave observations? What gaps exist in Gravitational Wave (GW) waveform simulations and how they can be bridged? What GW observations can be pursued jointly with electro-magnetic and particle observatories, and how? What data analysis and detector characterization challenges are being addressed to make GW discoveries in the ADE? How can we test General Relativity and constrain alternative theories of gravity?

There were over a dozen invited talks, 18 contributed talks, and 40 poster presentations that addressed the above questions. One of the invited talks was by Srikumar Banerjee of the Bhabha Atomic Research Centre on Mega Science Projects in India and how the proposed "Laser Interfero-meter Gravitational-wave Observatory - India" (i.e., LIGO-India) can fulfill its mission as one such project. Ajit Kembhavi of IUCAA gave a status update on LIGO-India.

There was a panel discussion on one of the main themes of the meeting, namely, "Multi–messenger astronomy with networks of GW detectors and EM/particle observatories", which recognized the importance and challenges of following up GW events to search for electromagnetic or particle counterparts. There were lightning presentations by the authors of posters. This workshop was a boost to young researchers in Gravitational Waves.

Sukanta Bose coordinated this workshop.

The next GWPAW will be held during June 17 - 20, 2015, in Osaka, Japan.

Workshop on Light Scattering Techniques and Applications to Astronomy and other areas

This workshop was held at the S. N. Bose National Centre for Basic Sciences, Kolkata during November 19 - 21, 2013, and was jointly funded by the S. N. Bose National Centre for Basic Sciences, Kolkata and IUCAA. Thirty five participants from all over India (Assam University, Tezpur University, Punjab University, JNU, Birla Planetarium Jaipur, ICCSIR Ahmedabad, PRL Ahmedabad, IIT Kanpur, IUCAA Pune, IIA Bangalore, IISER Kolkata, ICSP Kolkata, SNBNCBS Kolkata, ISI Kolkata) attended the workshop.

The number of resource persons (speakers) were 25. Various topics, related to light scattering techniques, were covered and discussed. The techniques discussed were static light scattering, dynamical light scattering, reflectance methods, simulation and modelling, approximation methods such as including discrete dipole approximation, effective medium theories. Aapplications included scattering and absorption studies from cosmic dusts of various origins and biomedical tissues.

S. K. Sharma and Ranjan Gupta were the coordinators of this workshop.

Welcome ...

Shruti Tripathi, who has joined as a post-doctoral fellow.

Shruti Tripathi did her Ph.D. from D.D.U. Gorakhpur University, under the supervision of Shantanu Rastogi. During her Ph.D., she also worked under the guidance of Ranjeev Misra and Gulab Dewangan at IUCAA. After submitting her thesis, she joined IUCAA as a Project Scientist. Recently, she has joined IUCAA as a Post-doctoral Fellow.

During her Ph.D., she has worked on projects to understand the variability character of Active Galactic Nuclei (AGN) in X-rays. She has made use of available archival data from different X-ray missions. Her research work involves X-ray data analysis of AGNs using XMM-Newton, Suzaku and Chandra observatory data. The emphasis has been to understand the variable behaviour of AGNs by means of timing analysis methods and spectral studies.

She has reported X-ray soft time lags in the XMM-Newton observation of Mrk 1040. She has studied the spectral and timing properties of Mrk 110 and Ark 564 using Suzaku and XMM-Newton data. She has investigated the spectral variability and constraints on the geometry of the scattering medium in the case of IRAS 18325-5926.

Her present research interests include X-ray variability of AGN, multi-wavelength properties and optical-UV-X-ray studies in AGN.

... Farewell

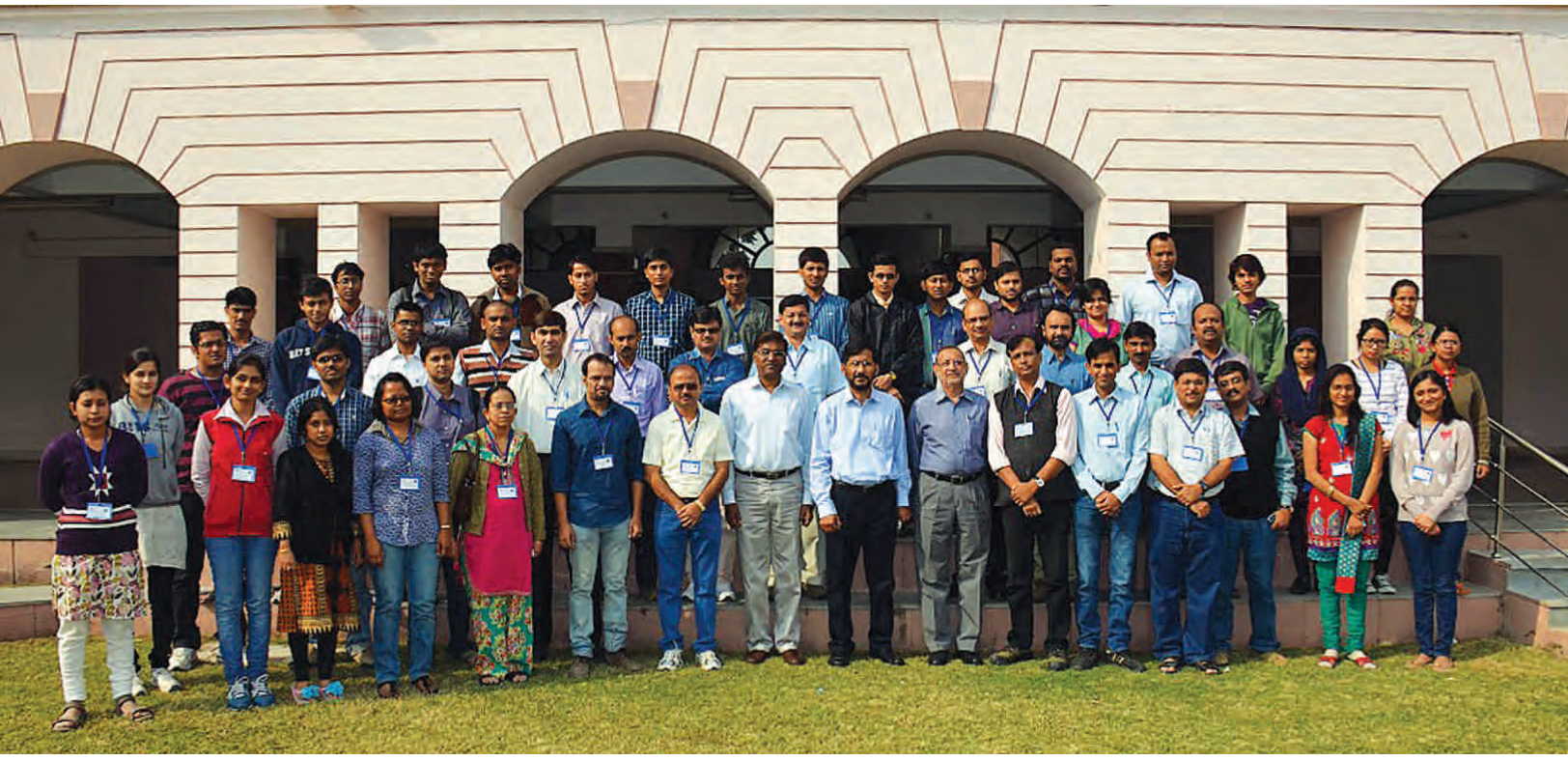
Gaurav Goswami, who has joined PRL, Ahmedabad as a Post-doctoral Fellow.

Sanved Kolekar, who has joined KITP, Beijing, China, as a Post-doctoral Fellow.

Prakash Sarkar, completed his tenure and joined TIFR, Mumbai, as a Post-doctoral Fellow.

Bibhas Ranjan Majhi, joined Racah Institute of Physics, Hebrew University of Jerusalem, Israel, as Lady Davis Post-doctoral Fellow.

Autumn School on Cosmology



Department of Physics, BITS Pilani – Pilani campus, in association with IUCAA, Pune, organized an Autumn School on Cosmology during November 5 - 15, 2013. The school had a flying start with an inauguration, in which Vice Chancellor B. N. Jain, Director G. Raghurama, HOD of Physics, Debashis Bandyopadhyay, R. Mishra, organizer of the Workshop, T. Guha Sarkar, faculty members and students of the department along with participants, who came from various universities of the country, participated. The school aimed to provide an exposure to the basic aspects of cosmology and areas of frontier research. Target participants were fresh Ph.D. students, planning to pursue research in cosmology. There were 27 participants from universities and research institutes across the country. The following topics were covered in the School:

Introduction to cosmology, Thermal history of the universe, The inflationary universe, Inhomogeneous universe and structure formation, CMBR physics, Dark matter and dark energy.

Apart from BITS faculty members, resource persons were drawn from IUCAA; National Centre for Radio Astrophysics, Pune; Indian Statistical Institute, Kolkata; Delhi University and Jamia Millia Islamia University, Delhi.

Tarun Souradeep and Debashis Bandyopadhyay coordinated this workshop.

Proposals for holding Workshops/Schools outside IUCAA

Proposals to conduct workshops/schools in Astronomy and Astrophysics or related areas are invited from university departments/affiliated colleges, and the same may be sent to the Administrative Officer, Core Programmes, (email; aocp@iucaa.ernet.in), IUCAA, by March 31, 2014 (for events to be conducted during August 2014 - July 2015), so as to be included in the academic calendar for the next academic year.

The following details should be given while sending the proposals: (i) the title (topic), (ii) duration of the workshop/school, (iii) topics to be covered and number of lectures in each topic, (iv) the level of audience and their number, (v) the number of resource persons available locally and the number of resource persons expected from IUCAA, and (vi) a description of the facilities available and (vii) the budget estimates (clearly stating the support offered by the host university/institute).

It is generally expected that infrastructural facilities and accommodation to the participants as well as the resource persons will be provided by the host institution. Other expenses will be borne by IUCAA. The proposers are encouraged to consult IUCAA faculty while framing the proposal.

Once the workshop/school is approved, IUCAA will nominate a coordinator from its faculty, who will interact with the organiser in relation to the academic programme, budget, and identifying and approaching the resource persons.

Chip Arp (1927-2013)

Halton C. Arp, more commonly known as Chip Arp, passed away in Munich on December 28, 2013. His death marks the departure from the astronomical stage of one more of the classic astronomers who revived astronomy with modern tools, observational or theoretical, in the post-World War II decade: like Jan Oort, Allan Sandage, Geoffrey Burbidge, Fred Hoyle, *et al*.

Born on March 21, 1927, Chip graduated from Harward in 1949, followed by Ph.D. at Caltech in 1953. He was a contemporary of another great astronomer at Caltech, Allan Sandage, and as students both were inspired by Edwin Hubble in his last years. Chip became a staff member at the Palomar Observatory and worked there from 1957 to 1986. His final years from mid-1980s were spent at the Max Planck Institute for Astrophysics in Munich.

An excellent observer in optical astronomy, Chip was known to be very meticulous, and one of his compilations, the **Atlas of Peculiar Galaxies** is a Bible for observers studying the morphology, evolution and any unusual aspects of galaxies. Indeed, his early work, gave the promise that he would emerge as a leading worker in the astronomical establishment.

Instead, by mid-1960s Chip began to find evidence that went against the views of the establishment. After four decades, the Hubble law was getting firmly established and extended to distances of hundred to thousand times those covered in Hubble's pioneering survey. Chip's contemporary, Allan Sandage was playing a leading role in one of the two teams of optical astronomers engaged in this major cosmological investigation.

Against this background, Chip's studies of the unusual objects led him to discover apparent anomalies in Hubble's law. A typical anomalous case would be a pair of extragalactic sources A and B lying very close to each other with redshifts z_A and z_B such that $z_B >> z_A$. If we take Hubble's law as correct, we have to conclude that B is much farther away from us than A. This means that B happens to be projected so close to A by chance. If we know the population density on the sky of B type sources, we can estimate this probability of this event. Suppose it turns out to be much less than 1%, often as low as 0.01%. If, following the usual statistical practice, we reject the hypothesis of Hubble's law, we have to conclude that these two sources are real neighbours, and B posseses an extra component of redshift. Chip called this intrinsic redshift zi and defined it by the relation:

$$(1 + z_i)\ (1 + z_A) = (1 + z_B).$$

This intrinsic redshift is often referred to as 'anomalous' redshift. It implies that Hubble's law does not account for all the redshift of the extragalactic object.

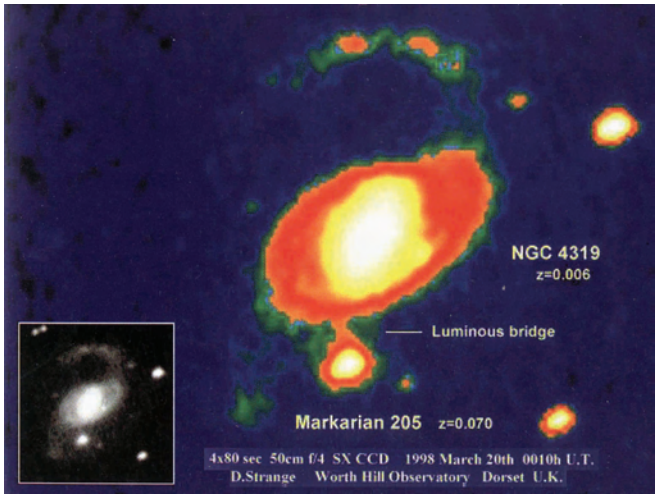
Such an assertion amounts to killing the holy cow of cosmology. The modern theory of cosmology (the so-called big bang theory) depends on Hubble law being right. Not surprisingly, Chip had to face tremendous opposition or skepticism from most quarters. More so when he produced evidence that quasars are objects with large intrinsic redshifts.

The case of the pair of neighbouring objects NGC 4319 (a galaxy) and Marakarian 205 (a quasar like object with significantly larger redshift than the neighbouring galaxy) is of interest in illustrating how the anomalous cases are treated. In 1971, Arp found a filamentary connection between these two neighbours, and if it were real, it became hard to understand this pair in conventional terms. However, other observers repeated the observations and claimed that there was no filament, thus casting doubt on Chip's claim and credibility as observer. Chip then repeated the observation showing the filament and arguing that if the film is not exposed long enough no filament would be seen. The last word in this controversy was said in 1983 by Jack Sulentic, who used the newly available CCD technology to demonstrate the reality of the filament.

At first, in the late sixties, Chip was asked to produce more evidence of this kind with the expectation that what he had found was flash in the pan with no further cases of that kind turning up. He did and found such cases not only in optical astronomy but also in radio and x-ray astronomy. Also, his cases included: (1) unusual concentration of high redshift quasars near NGC galaxies with redshifts less than 0.1, (2) alignments of quasars near a central galaxy suggesting that the quasars were ejected by the galaxy, (3) matching redshifts of quasars across the galaxy again suggesting ejection, (4) two galaxies connected by filaments or bridges but having different redshifts, and (5) periodicity in the intrinsic redshifts.

Chip had an explanation of cases (1) to (4) in terms of a variable mass theory emerging from the Machian theory of gravity of Hoyle and Narlikar. But the apparent periodicity was hard to explain. At the time of writing this account, there is conflicting evidence about this effect originally found by Karlsson in 1971 with some observers claiming that the effect goes away with large populations like those in Sloan Digital Sky Survey, while others showing that it persists when correct statistical analysis is done. This effect was occupying Chip in recent times.

Naturally, in his lifetime, Chip had to face violent opposition when publishing papers. His work was unofficially banned from conferences. A crisis came when his own institution (The Palomar Observatory) banned his usage of its telescopes. One of the stated reasons for denying him observing time was reportedly that what he observed did not seem to make sense! He resigned and settled in Germany, where he initially was Humboldt Fellow at the Max Planck Institute for Astrophysics. There too he did not have smooth sailing but he could use archival data to demonstrate more anomalous cases. There were, inevitably, difficulties and delays with publication but he patiently persisted.



The anomalous pair NGC 4319 and M 205

Chip was awarded the Helen B. Warner Prize by the American Astronomical Society, in 1960, followed by the Newcomb Clevelend Prize for his address at the AAAS Section D. In 1981-83 he was the President of the Astronomical Society of the Pacific.

Chip wrote two very readable books on his experiences and findings of anomalous cases: 'Quasars, Redshifts and Controversies' and 'Seeing Red'. These books, especially the latter one, reflect his frustration at his failure to make the establishment take the anomalies seriously.

It would not be improper to call Chip Arp, the Galileo of modern times.

Jayant V. Narlikar

IUCAA Preprints

IUCAA preprints released during October – December 2013 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 Expected

January 2014: Kishor Adhav, Sant Gadge Baba Amravati University, Amravati; Shah Alam, Jamia Millia Islamia, Delhi; Sudhanshu Barway, South African Astronomical Observatory, South Africa; Earl Bellinger, Indiana University, USA; Naseer Iqbal Bhat, University of Kashmir, Srinagar; Anandita Bhattacharjee, Assam University, Silchar; Brenda, University of Kwazulu-Natal, South Africa; Francisco Cabral, University of Lisbon, Portugal; Subenoy Chakraborty, Jadavpur University, Kolkata; Saikat Chatterjee, Presidency University, Kolkata; Tanuka Chattopadhyay, University of Calcutta, Kolkata; Laxmikant Chaware, Pandit Ravishankar Shukla University, Raipur; Rabin Chhetri, Sikkim Government College, Gangtok; Camille Couturier, University of Paris, France; Atri Deshamukhya, Assam University, Silchar; J.G. Doyle, Armagh Observatory, United Kingdom; Broja Gopal Dutta, Y.S. Palpara College, West Bengal; Sharad Gaonkar, Mumbai; Prerak Garg, VIT University, Vellore; Mubashir Hamid, University of Kashmir, Srinagar; Wali Hossain, Jamia Millia Islamia, Delhi; Joe Jacob, Newman College, Kerala; R.K. Jhingan, Delhi; Jithesh V., University of Calicut, Kerala; Nandita Kalita, Girijananda Choudhuri Institute of Management and Technology, Guwahati; Sanjeev Kalita, Gauhati University, Guwahati; M. Madjarska, Amargh Observatory, United Kingdom; Nilanjana Mahata, Jadavpur University, Kolkata; Manzoor Malik, University of Kashmir, Srinagar; Bari Maqbool, University of Kashmir, Srinagar; Tabasum Masood, University of Kashmir, Srinagar; Aditya Sow Mondal, Visva-Bharati University, Santiniketan; K.S.V.S. Narasimhan, New College, Chennai; Ryan Oelkers, Texas AMU University, USA; Supriya Pan, Jadavpur University, Kolkata; P.N. Pandita, North-Eastern Hill University, Shillong; M.K. Patil, Swami Ramanand Teerth Marathwada University, Nanded; Shantanu Rastogi, D.D.U. Gorakhpur Universit, ; C.D. Ravikumar, University of Calicut, Kerala; Anirban Saha, West Bengal State University, West Bengal; Subhajit Saha, Jadavpur University, Kolkata; H.P. Singh, University of Delhi,; Yugindro Singh, Manipur University, Imphal; Jozef Skakala, IISER, Trivandrum; B.V. Srirama, Hyderabad; Sharanya Sur, Arizona State University, USA; Avinash Surendran, Indian Institute of Astrophysics, Bangalore; Rachel Wagner-Kaiser, University of Florida, USA; Naveel Wani, University of Kashmir, Srinagar; and John Whelan, Rochester Institute of Technology, United Kingdom.

February 2014: Sheelu Abraham, St. Thomas College, Kozhencherri, Kerala; S.K. Banerjee, University of Petroleum and Energy Studies, Dehradun; Sudhanshu Barway, South African Astronomical Observatory, South Africa; Bijay Kumar Bera, Ramakrishna Mission Residential College, Kolkata; Koushik Chakraborty, Government Training College, Hooghly; Savithri Ezhikode, St. Thomas College, Kozhencherri, Kerala; Gary Ferland, University of Kentucky, USA; Fred Gent, University of Sheffield, United Kingdom; Janusz Gil, University of Zielong-Gora, Poland; Arun Kumar, St. Thomas College, Kozhencherri, Kerala; George Melikidze, University of Zielong-Gora, Poland; Sailendra Nath Paul, Serampore Girl's College, Kolkata; Nelson Rodrigues, St. Albert's College, Ernakulam, Kerala, Sonali Sachdeva, University of Delhi,; Anvar Shukurov, University of Newcastle, United Kingdom; Anjali Dona Varghese, and St. Albert's College, Ernakulam, Kerala.

March 2014: Steven Kahn, Director, LSST.

Visitors
(October - December 2013)

Sheelu Abraham, Vivek Agrawal, Nomaan Ahmed, Avinash Ashok Aher, Bobomurat Ahmedov, Moumita Aich, Shah Alam, Sk. Saiyad Ali, Jayant and Mrs. Anantpur, Abhishek Anchal, S. Annapurni, G.C. Anupama, Varghese Anto, K.G. Arun, Manjari Bagchi, Ayan Banerjee, Dipankar Banerjee, Srikumar Banerjee, Sumita Banerjee, Lisa Barsotti, A. Raja Bayanna, Tomaso Belloni, Swetha Bhagwat, Divya Bhatnagar, Gour Bhattacharya, Samarpita Bhattacharya, K.G. Biju, Ritabrata Biswas, Francisco Cabral, Laura Cadonati, Koushik Chakraborty, Arnab Chakravarty, Sabyasachi Chatterjee, Goutami Chattopadhyay, Surajit Chattopadhyay, Laxmikant Chaware, Sayantan Choudhury, Digpal Singh Chundawat, Haeun Chung, Patrick Dasgupta, Ujjal Debnath, Jishnu Dey, Mira Dey, Broja Gopal Dutta, Mathew Evans, Savithri Ezhikode, Stephen Fairhurst, Praful Gagrani, Sharad Gaonkar, Archisman Ghosh, Avyarthana Ghosh, Ritesh Ghosh, Sushant Ghosh, Tuhin Ghosh, Debashis Ghoshal, Kim Gillies, A. Gopakumar, Sarbari Guha, Guanluca Guidi, Alok C. Gupta, Anuradha Gupta, Manoj Kumar Gupta, Rajalakshmi Gurumurthy, Abdullo Hakimov, Mubashir Hamid, K.P. Harikrishnan, M.K. Haris, Sk. Monowar Hossein, Tanvir Husain, Safiqul Islam, Yousuke Ito, Bala Iyer, S.N.A. Jaaffrey, Joe Jacob, Rinku Jacob, Manish Jain, Muskan Jain, Pankaj Jain, Purushottam Jangid, Karan Jani, Amruta Jaodand, Tarun Jha, Sanjay Jhingan, Jithesh V., Reju Sam John, Suryakant Joshi, Kanti Jotania, Chinmay Kalaghatgi, Md. Mehedi Kalam, Atish Kamble, Shashi Kanbur, Indrani Karar, Gaurav Kasera, Shilpa Kastha, L.N. Katkar, Rupali Kelkar, Ravindra Keskar, Rizwan Shahid Khan, Rishi Khatri, Shubha Kotambkar, Dawood Kothawala, Badri Krishnan, Ajai Kumar, Arun Kumar, Saurabh Kumar, Shibesh Kumar, Suresh Kumar, V.C. Kuriakose, M.L. Kurtadikar, B.S. Kushvah, Ankur Kushwaha, Koutarou Kyutoku, Alain Lecavelier, Hyung Mok Lee, Ashish Mahabal, Manzoor A. Malik, Soma Mandal, Surinder Manhas, Bari Maqbool, Smita Mathur, Christopher Mayer, Nairwita Mazumder, Ganesh Meshram, Christopher Messenger, Chandrakant Mishra, Subhasmita Mishra, Rekhesh Mohan, Satya Mohapatra, Aditya Sow Mondal, Veena Motwani, Benoit Mours, Pradip Mukherjee, Pramod G. Musrif, Sowgat Muzahid, K.C. Nair, K.J. Nair, Remya Nair, Anuj Nandi, Rajesh Nayak, Tejaswini Nerella, Archana Pai, Ashok Kumar, Barun Kumar, Anil Pandey, Shashi Bhushan, Ajith Parameswaran, Gangotri Patel, K.D. Patil, B.C. Paul, Surajit Paul, Devraj Pawar, Pramod Pawar, Khun Sang Phukon, Sateesha Poojary, Walter Del Pozzo, Anirudh Pradhan, Khushboo Punia, Sanjay Puri, Frederick Raab, Farook Rahaman, Asokaran Rajh, Tharanath Ramachandran, Chayan Ranjit, Sujata Kundu Ranjit, A.R. Rao, Yashwanta Rao, B.S. Ratanpal, Alak Ray, Saibal Ray, Subharthi Ray, Somak Raychaudhury, Jocelyn Read, B. Eswar Reddy, Annigret Ritter, Amit Singha, Anirban Roy, Prabir Rudra, Soumendra Nath, Malu S., Margarita Safonova, Anirban Saha, Kanak Saha, Sanjay Kumar Sahay, T. Sahay, Sunder B. Sahayanathan, Sanjit Sahu, Yoshio Saito, Sameer Tanaji Salunkhe, Anuradha Samajdar, Prasant Kumar Samantray, Shishir Sankhyayan, Prakash Sarkar, Subrata Sarker, Bhim Prasad Sarmah, Sanjay Sarwe, B.S. Sathyaprakash, Saneesh Sebastian, Anjan Ananda Sen, Asoke Kumar Sen, Anand Sengupta, Alberto Sesana, Ekta Shah, Kiran Shanker, Ashu Sharma, Ramakrishna Sharma, Ranjan Sharma, Peter Shawhan, Sanjar Shaymatov, Yuri Shtanov, K.P. Singh, Atreyee Sinha, Mark Sirota, David Smith, Joshua Smith, P. Sreekumar, Ronald Stark, Vipin Sudevan, Avinash Surendran, Jishnu Suresh, Hirotaka Takahashi, Preeti Tailor, Amarjit Tamang, V. Siva Teja, Joby Thomas, Shubanshu Tiwari, Pranjal Trivedi, Anurag Tyagi, Paniveni Udayashankar, Umapathy, C.S. Unnikrishnan, Mahaveer Upadhyay, Vivek Kumar Upadhyay, Vijay Varma, Tejaswi Venumadhav, Louis Vertegaal, R.G. Vishwakarma, Alexander Viznyuk, Naveel Wani, and Stanley Whitcomb.

Long Term Visitors

P. C. Agrawal

Haeun Chung

Sanjeev Dhurandhar

Pushpa Khare

Gopal Krishna

IUCAA Seminars

15.10.2013	Rishi Khatri on ***After Planck: The road to observing 17 E-folds of inflation.***
12.11.2013	Shashi Kanbur on ***The non-linearity of the CEPHEID period – luminosity relation.***
28.11.2013	Ram Gopal Vishwakarma on ***Introduction of T^{ik}: Einstein's real `biggest blunder'.***

Colloquium

05.12.2013	Tomaso Belloni on ***Black holes and neutron stars in our galaxy as laboratories for strong gravity.***

Vultures - The Master of Skies

Hello friends,

My last article was about the significant role of the Vultures. In this concluding part let's read more about this scavenger bird.

The long billed vulture (Gyps indicus) is a typical one with bald head, pale yellow-white bill. The feathers on the back are brown, and the head and neck are black. This vulture is about 80-100 cm in length, 4-8 kg in weight and has a wingspan of about 6–8 feet. The habitat is mainly hilly area, but some of their nests are also seen on the trees. The nests are huge in size (average 3 feet).The breeding season is from November to March. They are slow breeders and lay mostly only one egg and incubate it for about 1.5 to two months. Both male and female take part in this.

Long billed Vulture
(Photo Courtesy : Umesh Vaghela)

The white-rumped vulture (Gyps bengalensis) is the smallest among the Gyps species. This vulture is about 75-90 cm in length, 3-7.5 kg in weight and has a wingspan of about 6–8 feet. It has a white neck, whitish back rump, and under wing feathers. The body is black and the head is slightly pink and bill is silvery.

The vultures are usually inactive until the morning, and they fly when the air is hot with sufficient thermals to support their soaring. They circle and rise in altitude and join and move off in a glide to change thermals. Once upon a time, they were seen in large numbers in the late morning skies above Indian cities.

Egyptian Vulture
(Photo Courtesy: Nitin Srinivasamurthy)

Some Interesting facts about Vultures:

- Vultures are social, unlike many raptors, and they feed in flocks.
- Their senses of sight are excellent, which helps in locating food. Some vulture can also smell.
- Their stomach acids are strong enough to kill harmful bacteria.
- There are 22 vulture species in the world and the largest one is Andean Condor: Mass ~ 12 kg, wingspan ~10 feet
- Vultures do not kill their own prey, and only feed on dead carcasses.
- A large flock of vultures can finish a carcass in an hour or so.
- In many countries, people have set up vulture restaurants or feeding sites where carcasses can be left out for vultures. These restaurants help to ensure that vultures have enough food and can help them to avoid contaminated carcasses. These are even visited by tourists who enjoy watching the vultures feed.

Nest of Long billed Vulture
(Photo Courtesy: Deepak Sawant)

* International Vulture Awareness Day is on first Saturday in September each year.

If you wish to see these ultimate recyclers which keep our environment clean and disease free, please visit areas around Pune like Baner hill, Tamhini, and Talegaon.

(DO NOT FORGET TO WATCH "The Vanishing Vultures" by Mike Pandey is available on YouTube)

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We welcome your responses at the following address :
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