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A novel workshop on the working of the new software - World Wide Telescope (WWT) by Microsoft was recently conducted at IUCAA in collaboration with the California Institute of Technology (Caltech), USA and Microsoft Research. The events were scheduled in three sessions on Saturday, September 4, 2010.

The first session was for astronomers, science popularisers and others who could be professionally using WWT. There were about 70 participants from various IUCAA Resource Centres, universities, outreach departments, planetaria and NGOs. There were four foreign participants from Nepal and South Africa as well. Ajit Kembhavi gave the welcome

Workshop: World Wide Telescope and Virtual Observatory

address and talked about the Virtual Observatory project and its relation to the WWT. Followed by this, the participants were exposed to some details of WWT by Sridhar Vedantham and Yan Xu of Microsoft Research. Later during the session T. R. Seshadri of IRC Delhi, along with Pranjal Trivedi of Venkateshwara College, New Delhi, made a presentation on the science and outreach activities in universities and colleges.

The afternoon session, included students, astronomy enthusiasts etc. and with more than 300 attendees, was held in the Chandrashekhhar Auditorium. A short introduction to the IUCAA public outreach programme by Gulab Dewangan was followed by an exciting exposure to WWT, its working, localisation and making tours.



Yan Xu of Microsoft Research addressing the gathering



T.R. Seshadri, presenting the public outreach activities at the University of Delhi

The presentations were done by Arvind Paranjpye, Samir Dhurde and Aparna Joshi, which managed to influence a lot of people to use WWT themselves and participate in future work, like making tours in Indian languages. Examples of Marathi and Malayalam tours made at IUCAA were showcased. Some members of the audience were also invited on stage to make their own wonderful tours in a few minutes. Post this session, Ashish Mahabal of Caltech, conducted a discussion, where ideas and possibilities of future use of WWT was considered.

The final session was, in fact a Public Lecture titled “WWT and Astronomy on the man-machine interface” by S. George Djorgovski, Director of Center for Advanced Computing Research, Caltech. He also presented some of his own related scientific ideas using WWT. In all, the workshop was very successful with all sessions marked by intense interaction with participants. IUCAA will be setting up the WWT IUCAA community site in the future.

WWT website : <http://www.worldwidetelescope.org/>

IUCAA Preprints

Listed below are the IUCAA preprints released during July to September 2010. These 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>

N. Gupta, R. Srianand, D. V. Bowen, D. G. York and Y. Wadadekar, GMRT mini-survey to search for 21-cm absorption in quasar-galaxy pairs at $z \sim 0.1$, IUCAA-14/2010; Sanjay Sarwe and Ramesh Tikekar, Non-adiabatic gravitational collapse of a superdense star, IUCAA-15/2010; Yoichi Itoh, Ranjan Gupta, Yumiko Oasa, Asoke Sen, Munechika Tanaka, Tsuyoshi Terai and Seina Nakaoka, Optical spectroscopy of candidates of young stellar objects in NGC 1333, IUCAA-16/2010; A. K. Sen, V. F. Polcaro, I. Dey and R. Gupta, Photopolarimetric study of the star-forming clouds CB3, CB25 and CB39, IUCAA-17/2010; Vinu Vikram, Yogesh Wadadekar, Ajit

Kembhavi and Vijayagovindan, PyMorph: Automated galaxy structural parameter estimation using Python, IUCAA-18/2010; Luigi Iapichino, Jens C. Niemeyer, Surajit Paul and Wolfram Schmidt, Turbulence modeling and the physics of the intra-cluster medium, IUCAA-19/2010; Yue Wu, Harinder P. Singh, Philippe Prugniel, Ranjan Gupta and Mina Koleva, Coude-feed stellar spectral library - atmospheric parameters, IUCAA-20/2010; Biswajit Pandey, Gauri Kulkarni, Somnath Bhardwaj and Tarun Sourdeep, The size of the longest filament in the luminous red galaxy distribution, IUCAA-21/2010.

Welcome to the IUCAA Family

IUCAA is happy to announce the selection of the Twenty-first Batch (2010) of Visiting Associates. The Visiting Associateship is for a tenure of three years beginning August 1, 2010.

Extension of Term to the Eighteenth Batch of Visiting Associates

01. G. Ambika, Indian Institute of Science Education and Research (IISER), Pune
02. Narayan Banerjee, Indian Institute of Science Education and Research (IISER), Kolkata
03. Pavan Chakraborty, Indian Institute of Information Technology, Allahabad
04. Subenoy Chakraborty, Jadavpur University, Kolkata
05. Himadri Sekhar Das, Assam University, Silchar
06. Sushant G. Ghosh, Jamia Millia Islamia, New Delhi
07. K.P. Harikrishnan, The Cochin College, Kochi
08. S.N.A. Jaaffrey, M.L. Sukhadia University, Udaipur
09. Sanjay Jhingan, Jamia Millia Islamia, New Delhi
10. Kanti R. Jotania, The M.S. University of Baroda, Vadodara
11. Nagendra Kumar, M.M.H. College, Ghaziabad
12. P.N. Pandita, North Eastern Hill University, Shillong
13. Madhav K. Patil, Swami Ramananad Teerth Marathwada University, Nanded
14. Biplab Raychaudhuri, Visva Bharati University, Santiniketan
15. Anirban Saha, West Bengal State University, North 24 Parganas, West Bengal
16. Anjan Ananda Sen, Jamia Millia Islamia, New Delhi
17. Harinder Pal Singh, University of Delhi
18. Paniveni Udayashankar, NIE Institute of Technology, Mysore
19. Anisul Ain Usmani, Aligarh Muslim University.

New Visiting Associates

01. Farooq Ahmad, University of Kashmir, Srinagar
02. Tanwi Bandyopadhyay, Shri Shikshayatan College, Kolkata
03. Bhag Chand Chauhan, Government College Karsog, Mandi, Himachal Pradesh
04. K. Indulekha, Mahatma Gandhi University, Kottayam
05. Md. Mehedi Kalam, Netaji Nagar College for Women, Kolkata
06. Badam Singh Kushvah, Indian School of Mines, Dhanbad
07. Archana Pai, Indian Institute of Science Education and Research (IISER), Thiruvananthapuram
08. Anirudh Pradhan, Hindu Post-graduate College, Zamania, Ghazipur
09. Tarun Deep Saini, Indian Institute of Science, Bangalore
10. Pramoda Kumar Samal, Utkal University, Bhubaneswar

Graduate School Courses

The IUCAA-NCRA Graduate School (being conducted jointly with the National Centre for Radio Astrophysics (NCRA), Pune) is divided into two semesters (four terms) spread over one year. Each term is of roughly eight weeks duration. During the Graduate School, the Ph.D. students (Research Scholars) are taught relevant advanced courses in Physics and are also introduced to courses in Astronomy and Astrophysics (A & A). The Graduate School structure is given below. The number of teaching hours is shown in brackets after each course.

Semester I, Term I

From August second week to October first week

01. Methods of Mathematical Physics I (21)
02. Introduction to Astronomy and Astrophysics I (14)
03. Electrodynamics and Radiative Processes I (14)
04. Quantum and Statistical Mechanics I (14)

Semester II, Term I

From January first week to February fourth week

09. Astronomical Techniques I (14)
10. Galaxies : Structure, Dynamics and Evolution (21)
11. Extragalactic Astronomy I (21)

Semester I, Term II

From October third week to December second week

05. Methods of Mathematical Physics II (14)
06. Introduction to Astronomy and Astrophysics II (14)
07. Electrodynamics and Radiative Processes II (14)
08. Quantum and Statistical Mechanics II (14)

Semester II, Term II

From March third week to May second week

12. Astronomical Techniques II (14)
13. Interstellar Medium (14)
14. Extragalactic Astronomy II (14)
15. Project Work (During May - July).
16. Topical Course (for earlier batch of students) (< 21)

1. The courses are designed, emphasizing the aspects which are directly relevant to A&A. It is assumed that unnecessary repetition of material, which is already taught at M.Sc. is avoided.
2. The syllabus provides enough avenues for topics which are of "local interest" to be included in the graduate school. This is necessary so that graduate students coming out of IUCAA/NCRA, not only have a comprehensive grasp of the A & A, but are also aware of the key research areas in which these two institutions are concentrating at present. Detailed syllabus may be found in the website: <http://www.iucaa.ernet.in/Academics-->Ph.D.Programme>.

If any of the Research Scholars from Indian universities/colleges are interested in attending any of these courses, they may contact: The Administrative Officer (Core Programmes), IUCAA, e-mail: snk@iucaa.ernet.in.

Welcome to...

Jayanti Prasad, who has joined as a Post-doctoral Fellow. His areas of research are Cosmology, Structure formation in universe, and Cosmological N-body simulations.

Pallavi Bhat, Vikram Khair, Nagendra Kumar, Main Pal and Krishna Mohan Parattu, who have joined as Research Scholars.

Pritesh Ranadive, who has joined as Project Junior Research Fellow.

...Farewell to

Kinjal Banerjee, who has joined the Beijing Normal University as a Post-doctoral Fellow.

Bruce Cabral, who has left IUCAA.

Radouane Gannouji who has left IUCAA.

Dawood Ahsan Kothawala, who has joined the University of New Brunswick, Canada as a Post-doctoral Fellow.

Inviting Proposals for 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:snk@iucaa.ernet.in), IUCAA, by March 15, 2011 (for events to be conducted during August 2011 - July 2012), 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, (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.

IGO Training School in Observational Astronomy December 20, 2010 - January 15, 2011, at IUCAA, Pune

This school is aimed at training young researchers among Ph.D. Students, Post-doctoral Fellows, Faculty Members from Indian Universities/Colleges/Research Institutes in Astronomical Observations and Data Reduction.

During the school, one week will be devoted for observations with IUCAA Girawali Observatory (IGO) 2 m. telescope under the guidance of experienced astronomers, followed by data reduction and presentation of scientific results. Rest of the time will be used to introduce the basic fundamentals of optical observations. The number of participants is restricted to five.

Applications (in plain paper) with complete curriculum vitae, current research plans/ topics, e-mail address, etc. are invited from Ph.D. Students, Post-Doctoral Fellows, and young Faculty Members of Indian Universities/Colleges/Research Institutes, who want to pursue Observational Astronomy as their career, and the same should reach The Administrative Officer (Core Programmes), IUCAA, Post Bag 4, Ganeshkhind, Pune 411007, by Monday, November 01, 2010 (e-mail: snk@iucaa.ernet.in, fax: (020) 25604699). Ph.D. Student applicants should arrange to send a confidential reference letter from their Guide. The shortlisted candidates will be informed by the first week of December 2010, through e-mail.

All Indian outstation participants will be provided travel support as per the norms, and free hospitality during the school.

Coordinators of the School: R. Srianand and Vijay Mohan.

Seminars

Listed below are the seminars conducted at IUCAA during July - September 2010.

8.7.2010 Mansi Kasliwal on The Palomar transient factory; 12.7.2010 Manmohan Dash on Overview of the Belle experiment at KEK, Japan, and a new form of asymmetry measurement; 14.7.2010 Saugata Chatterjee on The black hole membrane paradigm in general theories of gravity; 14.7.2010 Sandeep Kumar on Modelling of Cyclotron Resonance Scattering Features (CRSF) in accreting neutron star spectra in X-ray binary system; 14.7.2010 Sowgat Muzahid on The properties of high redshift O VI absorber; 14.7.2010 Prasant Kumar Samantray on Rindler-AdS/CFT; 22.7.2010 Bruce Cabral on Origin of soft X-ray excess emission in NLS1: TONS180; 22.7.2010 Luke Chamandy on Magnetic fields of spiral galaxies; 22.7.2010 Mohammad Hasan on Origin of magnetars' field; 22.7.2010 Suprit Singh on Aspects of path integrals in quantum mechanics and field theory; 22.7.2010 Kaustubh Vaghmare on Supermassive black holes -Correlations and statistical methods; 23.7.2010 Arundhati Dasgupta on Coherent states and semi classical gravity; 27.7.2010 Smita Mathur on Demographics of black holes in the local universe; 28.7.2010 Mudit Srivastava on Design and development of an optical fibre based Integral Field Unit (IFU) for area spectroscopy on IUCAA 2m telescope; 5.8.2010 Mamta Pandey-Pommier on studying damped Lyman Alpha systems with MUSE/GMRT; 26.8.2010 Palodhi Lopamudra on Electromagnetic instabilities due to temperature anisotropy in the heart of collisionless plasma; 3.9.2010 Santanu Das on Detour into the relic radiation; 6.9.2010 George Djorgovski on Catalina real-time transient survey, and exploration of the time domain; 7.9.2010 Ashish Mahabal on Novel approaches to astronomical event classification.

Congratulations to...

Varun Sahni, on being elected Fellow of the Indian National Science Academy.

Photograph of the Annular Solar Eclipse of January 15, 2010



This photograph by Dhruv Paranjpye, age 14, of annular solar eclipse of January 15, 2010 was adjudged for the award of 'Young Astronomy Photographer of the Year 2010' by Royal Observatory Greenwich, in early September this year.

Dhruv is an amateur astronomer, who regularly visits Muktagan Vidnyan Shodhika for sky observations and volunteers for public sky watch during the IUCAA's National Science Day programmes.

For details on the award winning photograph see the link : <http://www.nmm.ac.uk/visit/exhibitions/astronomy-photographer-of-the-year/winners/young-astronomy-photographer-2010/>

Colloquia

30.8.2010 Alain Lecavelier on Extrasolar planets and their atmosphere; 20.9.2010 Debashish Ghoshal on Travelling front of the unstable brane.

Visitors

July - September 2010

Aditya Bawane, M. Vivek, V.C. Jain, M. Dash, Tarun Saini, Sonali Sachdeva, V. Vinu, B. Ahmedov, Bahodir Ahmedov, S.K. Banerjee, Shraddha Patel, Anil Kakodkar, Samir Mathur, Smita Mathur, S.P. Singh, G.C. Anupama, B. Eswar Reddy, Laxmikant Chaware, K. Jeena, V. Jithesh, P.N. Pandita, Monica Yadav, Shyamal Kishore, Anirban Saha, Pranav Kumar, Pankaj Kislay, Anirudh Pradhan, Padmini Yadav, Pushpa Khare, Bari Maqbool Bhat, Madhav Saraswat, Anoop Kumar Srivastava, J.P. Singh, Prashant Singh Baghel, Aditya Bawane, H.P. Singh, M.K. Patil, Ravi Kiron, T.R. Kem, S.K. Pandey, A.K. Dogra, Shantanu Rastogi, Asis Chattopadhyay, J.A.K. Tareen, K. Ramamurthy Naidu, Mihir Chaudhuri, P.C. Agrawal, S.S. Hasan, Mahadev Pandge, A. Abdujabbarov, Motiram Dugair, Sapna Sharma, Ashish Mahabal, George Djorgovski, Yan Xu, C.D. Ravikumar, E.A.S. Sarma, Kanti Jotania, C. Karthik, Arundhati Dasgupta, D.B. Vaidya, Minu Joy, Philip Thomas, Pramod Pawar, P. Shalima, K. Indulekha, Lopamudra Palodhi, Joe Jacob, K.S.V.S. Narasimhan, D.K. Ojha, P. Vivekananda Rao, Soma Mandal, Nidhi Joshi, R. Rakhi, Lynne Storrar, Sukhdeep Singh, Sneha Gokani, B. Ishwar, Bipash Dasgupta, Debashis Ghoshal, Shruti Tripathi, Shruti Thakur, Devraj Pawar, Saptarshi Mondal, and Pranjal Trivedi.

About 70 people attended the workshop on World Wide Telescope and Virtual Observatory on September 4 at IUCAA.

Long term visitors:

P. P. Divakaran (till October 2010), R. Tikekar (till May 2011), and N. Sajeeth Philip (till January 2011).

Congratulations to...

Arvind Gupta, on being conferred with the Professor T. Navaneeth Rao's Best Teacher Award by A.V. Rama Rao Research Foundation in association with Indian Institute of Chemical Technology (IICT), Hyderabad, for 2010.

Visitors Expected

October

Shiraz Minwalla, TIFR, Mumbai; Sheelu Abraham, St. Thomas College, Kozencherri, Kerala; Asif Iqbal, University of Kashmir; Shaja Rasool Wani, University of Kashmir; Shivam Sharma, University of Delhi; Prashant Singh, University of Delhi; Arun Kumar, St. Thomas College, Kozencherri, Kerala; Bari Maqbool Bhat, University of Kashmir; Motiram Dugair, M.L. Sukhadia University, Udaipur; Sapna Sharma, M.L. Sukhadia University, Udaipur; Vasudha Bhatnagar, University of Delhi; Somak Raychaudhury, University of Birmingham; Peter Tino, University of Birmingham; Anoubam Senorita Devi, Assam University, Silchar; Shailesh Kulkarni, HRI, Allahabad; S.G. Ghosh, Jamia Millia Islamia, New Delhi; Sanjay Jhingan, Jamia Millia Islamia, New Delhi; C.S. Stalin, IIA, Bangalore; Kiran Shanker, University of Allahabad; Ranjan Sharma, P. D. Women's College, Jalpaiguri; B.C. Paul, North Bengal University, Siliguri; Pragati Pradhan, St. Joseph's College Darjeeling; Aruna Goswami, Indian Institute of Astrophysics, Bangalore; Sufyan Haroon, University of Delhi; Agnieszka Janiuk, Nicolas Copernicus Inst, Poland; Biplab Raychaudhury, Visva Bharati, Santiniketan; and K.T. Thomas, KITS, Nagpur.

November

K.G. Biju, W.M.O. Arts and Science College, Kerala; Deepto Chakraborty, MIT, USA; Andrzej Zdziarski, Nicolas Copernicus Institute, Poland; Surajit Chattopadhyay, Palian College of Management and Technology, Kolkata; Armando Ferro, UNAM, Mexico; Kanti Jotania, The M.S. University of Baroda; N. Kanda, Osaka City University, Japan; H. Tagoshi, Osaka city University, Japan; and H. Takahashi, Nagaoka University of Technology, Japan.

December

Robert Botet, University of Paris, France; James Binney, University of Oxford, UK; Ujjal Debnath, Bengal Engineering and Science University, Howrah; Amir Hajian, CITA, Canada; Arman Shafieloo, University of Oxford, UK; Abhay Ashtekar, Pennsylvania State University, USA; Kameshwar Wali, Syracuse University, USA; Pradip Mukherjee, Presidency College, Kolkata; B.S. Kushvah, Indian School of Mines, Dhanbad; and Gour Bhattacharya, Presidency College, Kolkata.

Cumulonimbus: Clouds those bring rains

Not all clouds are rain producing clouds. Nimbus suffixed or prefixed to the name of a cloud type indicates presence of perceptible water that can reach the ground or in simple words these are the clouds those bring rain and also snow or hail. The two nimbus clouds are cumulonimbus and nimbostratus.

The cumulonimbus clouds are the advanced stage of cumulus clouds (discussed in Khagol No. 83). These are gigantic form of cumulus clouds, dark in colour and completely block the sun. These clouds form if cumulus congestus clouds continue to grow vertically. These clouds can reach tropopause. The cumulonimbus can reach the height well beyond 10,000 meters above the ground.

These clouds produce short intense burst of rain. If you are at top of a mountain or at an elevated place or have unobstructed view of the horizon then you can observe shower from these clouds that appears as gray sheet between the cloud and the ground.

These clouds have the capacity to hold up to half a million tons of water. These water droplets in the cloud are either closely packed or stay in a single mass, which usually causes thunderstorms.

Cumulonimbus clouds contain severe convection currents, with very high, unpredictable winds. These currents are extremely dangerous to aircraft flying through them, as these can move the aircrafts several tens of meters up or down. Hence, the pilots avoid flying through these clouds.

When straight winds at higher altitude shear off the top of cumulonimbus clouds, the anvil like shape develops. This anvil like part of the cloud precede the main cloud structure for many kilometers and cause anvil lightning.

We can observe these clouds during the post-monsoon season that is generally considered to be from October to December. This is the period of northeast or retreating monsoon heralding coming of crisp clear winter skies.



Photo of Cumulonimbus taken at IUCAA, Pune



Photo of Cumulonimbus with anvil, taken from an aircraft
Photo Credits : Arvind Paranjpye

Name	Cumulus
Symbol	Cb
Symbol (graphic representation)	
little vertical development	
Height	2000 to 12000 m
Symbol (graphic representation)	
Considerable vertical development	
Height	2000 to 12000 m

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

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