आईआईए न्यूज़लेटर

IIA Newsletter

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भारतीय ताराभौतिकी संस्थान
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In this issue...

National Science Day

The formation of interference fringes by the Sun being demonstrated to the Madivala school children, during the National Science Day at IIA. P Janaki Ram from the Electronics lab of IIA seen in the background.

National Science Day is celebrated all over the country on February 28, to commemorate the discovery of Raman Effect in 1928, by the Indian physicist Sir C. V. Raman. This year, E. Ebenezer coordinated the science day celebrations at IIA.The day was marked by several fun-filled activities for children, a science quiz, painting competition, talks, sun viewing, movies, exhibits, colourful poster sessions, etc. There were also exciting hands-on experiments in physics and chemistry to understand physical laws that govern our universe. Over 200 high school children from different schools in Koramangala and the adjoining areas have participated in this annual event.

K. B. Ramesh eloquently explained many fascinating and interesting features of our nearest star, the Sun. He also blended his talk with stunning visuals of solar flares, magnetic storms, coronal mass ejections and sunspots to show that the sun is a highly dynamic object and events that happen on its surface have direct bearing on the terrestrial life. Last decade was particularly exciting for the Indian space programme,with the success of the Chandrayaan-1 mission to the Moon has captured the imagination of many young people all over the country. Jayant Murthy spoke on 'Science from Space'. He described the importance of doing science from space and various scientific missions that are in progress, both in India and abroad.

The year 2011 is also celebrated as an international year of chemistry (IYC 2011) all over the world. S. Chatterjee gave a talk entitled, 'Discovery of Helium: Astronomy's gift to chemistry.' Helium is known to be the second

Students from Bethany and Madivala High School participating in a colourful painting competition .

C. Sivaram congratulating the students. E. Ebenezer, P. Chitta, and G.Vigeesh are seen in the background

most abundant element in the universe. Still lesser known is the fact that Helium was first observed in solar spectrum by a French astrophysicist Pierre Jules Janssen on 18th August 1868 during a total solar eclipse in Guntur (Andhra Pradesh, India). C. Sivaram, also well known for his popular talks and science writings, gave a lecture on the 'Frontiers in Astronomy.' The lecture covered the vast areas of research in astronomy. The vigilant students interested to pursue astronomy and astrophysics for their higher studies couldn't have asked for more!

Subsequently, E. Ebenezer led the team that conducted the painting competition and Pradeep Chitta organized the astronomy science quiz. Individual prizes for both these events were also given to the respective winners.

Science can be fun. One doesn't always need sophisticated instruments to demonstrate profound scientific principles in our daily lives. A lot of experiments can be done using readily available ingredients and common house hold items. Besides, demonstrations and hand-on experiments are the best way to arouse scientific curiosity and interests among children. Keeping the

R. Banyal and B. Ravindra explaining a point to the students

N. Sivaraj explaining the technical aspects involved in the telescope drive mechanisms

importance of experiments in mind, Ravinder Banyal and B. Ravindra had setup some exciting experiments that students could try for themselves. Many students were first amazed and thought it as some kind of magic before the proper explanation was given. Experiments to explain, the concepts of mechanics, electrostatics, laws fluids, properties of fundamental particles, were set up. J. P. Lancelot and his team showed the optics experiments done at the photonics division.

Students also enjoyed posters sessions covering a variety of themes which showcased existing and future observational facilities of the institute, a colorful depiction of our solar system, Sun, Space Weather Solar Terrestrial relationships, exotic phenomenon and objects in stellar and galactic astronomy. The study about Meteorites was explained by Neharika. The posters on Neutron stars and Fundamental particles were explained to the students by Dinesh kumar and Vaidei.

The models of HCT & Aditya attracted children. Also on display were models of our major telescopes and posters and a model were explained by the team of NLST volunteers.

In the evening, Ashok Pati delivered a public lecture, 'A Preface to Exploring the Universe'. Apart from introducing various objects in the night sky using virtual Planetarium - Stellarium, the speaker also took the audience on a fascinating journey of the solar system to the stellar denizens of the Milky Way and the far flung galaxies in the Universe. The concluding event of the day was the night sky- watch programme for general public. About 80 enthusiastic sky watchers spent till late night, with Amar Sharma, Naveen and Santhosh, to gaze at the stars and constellations. A 14-inch Meade telescope and a 3-inch Galileoscope were set up for viewing the night sky. Volunteers from the Bangalore Astronomical Society (BAS) helped visitors with familiarization and understanding of the celestial objects. Most importantly, students and supporting staff of IIA played a key role to make the science day a great success.

- Ravinder K. Banyal & Team

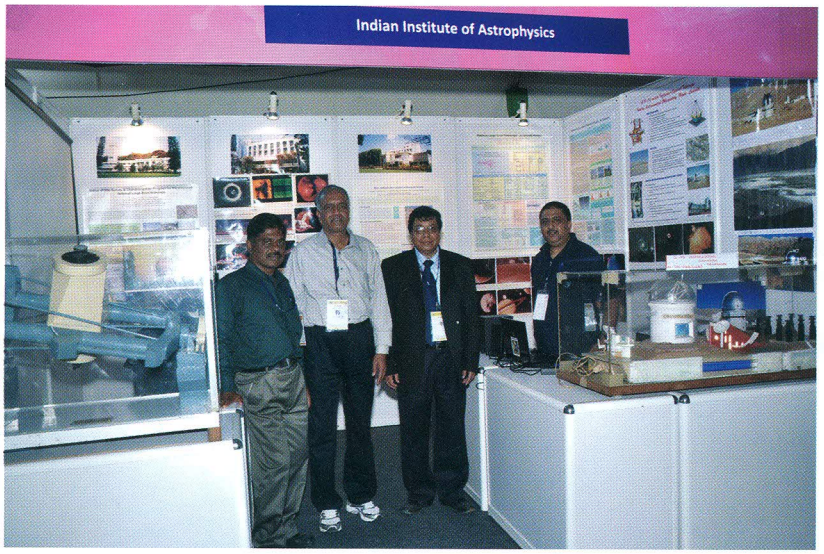
Telescopes – Tracking, Positioning, Pointing, Drive Systems and CCD Systems

Volunteers of the IIA Electronics lab,explained to the students the technical aspects involved in the telescope movements, various types of motors and drives used in the RA andb Dec axis and RA tracking. They were also explained about the Coelostat drive required for Solar image tracking during the total Solar Eclipse experiments, Micro stepping drive system- its advantages, applications, resolution , accuracy and Rotary stages for positioning. The students were explained about the CCD systems, used in the field of astronomy, the current advances in the imaging systems and performance of detectors.

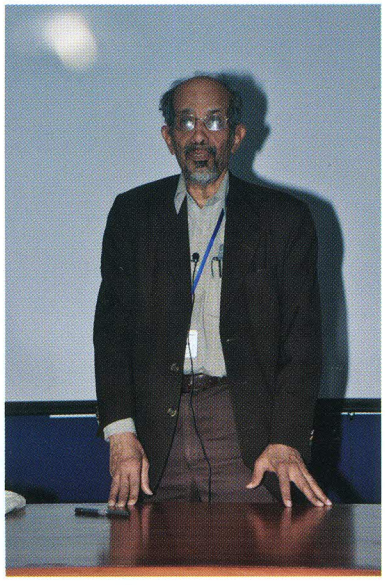
- N.Sivaraj, K. Anupama & P. Janaki Ram

Indian Science Congress

IIA exhibits at the 98th Indian science congress 3-7 January 2011 held at Chennai



The hydrodynamics of Cumulus Clouds



During the Humboldt Kolleg meeting at IIA, several experts in different areas of science visited IIA. Professor Roddam Narasimha, one of India's foremost aerospace scientists, gave a public lecture on the modelling of the Cumulus clouds. He is an internationally renowned fluid dynamicist. Prof. Narasimha is currently working at the Engineering Machanics unit at the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore. He founded the centre for Atmospheric and Oceanic Sciences. He also served as Director, in several leading institutions, after obtaining PhD in 1961, from Caltech, USA. He talked about the scientific challenges in understanding the dynamics of Cumulus clouds. He explained the details of modelling the Cumulus clouds as a class of turbulent shear flows, possibly as one whose distinctive characteristic is the internal generation of heat resulting from changes of phase between vapour/liquid/ ice in H2O. He concluded, by stressing on the role of cloud modelling in predicting the monsoons.

Pattern Formation in Biology

Professor Hans Meinhardt, gave the keynote address at the start of the Humboldt-Kolleg meet at IIA. Prof. H. Meinhardt works at the Max Planck-Institue for Developmental Biology in Tubingen, Germany. Before getting interested in Biology, he studied physics and worked at CERN and acquired computing skills in modelling complex systems. Later his work in biology, lead to the development of molecularly feasible models for pattern formation during the formation of higher organisms. He spoke on local self-enhancement and long-ranging inhibition as the driving force to the pattern-formation in biology. Development of higher organisms start with a single cell and leads to an overwhelming complexity of differentiated cells and tissues, which is under genetic control. He proposed that molecular realistic interaction accounts for the basic steps. He discussed how, many pattern-formation reactions have to be linked to each other in forming the full development of a healthy complex organism. In the talk, he showed simulations that show the dynamics of these pattern-forming reactions correspond precisely to the observations.

Physics of Angle-Dependent Partial Redistribution

The Rayleigh scattering of solar limb darkened radiation field on atoms and molecules gives rise to the linearly polarized spectrum of the Sun, the so called 'Second Solar Spectrum'. The linear polarization of strong resonance lines, in particular, are very sensitive to the form of the partial frequency redistribution (PRD) function used in the line radiative transfer computation. Observations have been analyzed until now using the angle-averaged PRD functions (see e.g., Anusha et al. 2010, ApJ, 718, 988). With an increase in the polarimetric sensitivity, and resolving power of the telescopes, it will become possible to detect 'finer effects' caused by the angle dependence of the PRD functions.

The difficulty in using angle-dependent functions in the polarized line radiative transfer computation, stems mainly from the 'evaluation' of the scattering integral, because these functions 'couple in an intricate way' the directions and frequencies of the incident and scattered beams (see Fig. 1). Recently we have developed new efficient numerical methods to solve the polarized line transfer equation with angle-dependent PRD function, in plane-parallel (cylindrically symmetrical) media. We use the recently developed 'Stokes vector decomposition technique' to formulate three different iterative methods capable to handle angle-dependent PRD functions. Two of them are of the accelerated lambda iteration (ALI) type -- one is based on the 'core-wing approach', and the other one on the frequency by frequency approach -- suitably

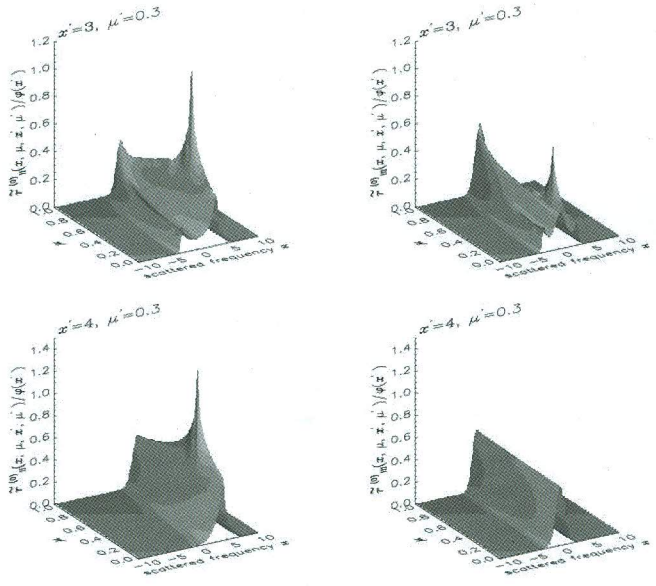


Figure 1. Surface plots of collisionless (left panels) and of collisional (right panels) PRD functions. The X and Y-axis represent respectively the outgoing frequency (x) and angle (m). The corresponding variables for the incoming ray are (x"= 3, m"= 0.3) for the top panels and (x" = 4, m"= 0.3) for bottom panels.

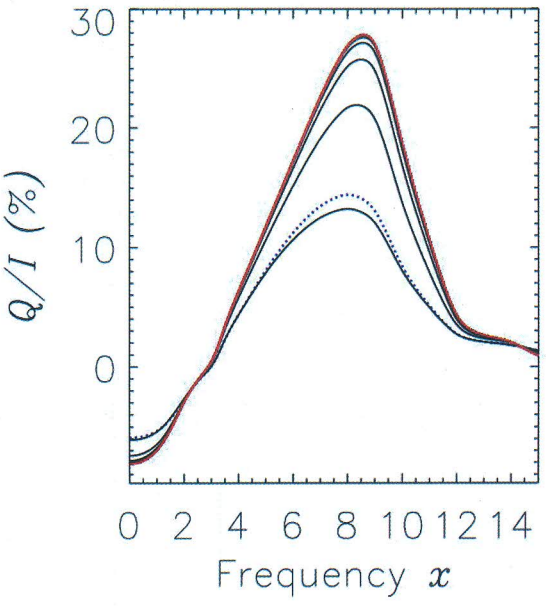


Figure 2. Convergence history of the degree of linear polarization (Q/I) for the SEM approach. The dotted (blue) line represents the single scattered solution. The converged multiply scattered solution is represented by the red line.

generalized to handle angle-dependent PRD. The third method is based on a 'Neumann series expansion in the mean number of scattering events', and is referred to as the Scattering Expansion Method (SEM).

We have shown that all these methods work well on this difficult problem. In particular, we show that the SEM is the fastest, while the ALI method based on the 'frequency-angle by frequency-angle approach' is the slowest (as it involves inverting huge matrices). For a typical line transfer problem, the SEM takes about 335 seconds, the core-wing ALI method takes about 633 seconds, while the frequency-angle by frequency-angle ALI approach takes about 30795 seconds. The SEM therefore appears particularly suited to problems of large dimensionality (very large number of frequency, angle, and depth grid points). In Figure 2 we show the convergence history for the degree of linear polarization Q/I calculated from the SEM. The dotted line represents the single scattered solution, which is the starting solution for the SEM iterative method. Notice that single scattered solution need not always give the maximum polarization. It can serve as a good approximation for the full scale radiative transfer solution.

We have carried out a detailed numerical study using simple model atmospheres to show the performance of the three numerical methods, and to analyze the role of the angle-dependent PRD. For 'weak lines', we find no significant effects when the angle-dependence of the PRD functions is taken into account. For 'strong lines', we find a significant decrease in the line polarization, the largest effect occurring in the near wing maxima. In particular, we show that the angle-averaged PRD functions generally overestimate the emergent polarization rate Q/I upto the maximum of 10--30 % for slabs with a large optical thickness. These theoretical developments will be incorporated in modeling the new spectro-polarimetric observations. *This work is published recently in Sampoorna, M., Nagendra, K. N., Frisch, H. 2011, A&A, 527, A89-A104.*

-M. Sampoorna, K. N. Nagendra, H. Frisch

Diffuse Radiation field of the Galaxy

We have been using GALEX data to understand the diffuse radiation field in our Galaxy. GALEX was launched in 2003 to study galaxy evolution; however, it has also observed over 70% of the sky in two ultraviolet bands. Most of these observations are short, about 100 seconds in length, but a few are deep observations of several thousands of seconds in length. These observations have been instrumental in, for the first time, mapping the ultraviolet background both on large scales and with high spatial resolution.

The diffuse ultraviolet background is dominated by starlight scattered by interstellar dust with extragalactic

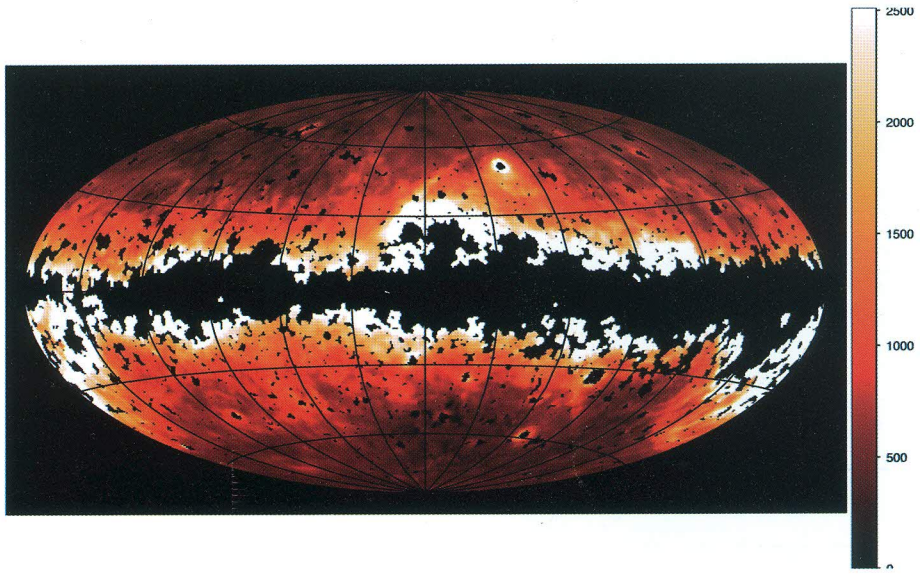


Figure 1. GALEX view of the ultraviolet sky

light becoming important at the highest galactic latitudes. This is reflected in the GALEX view of the ultraviolet sky (ApJ, 724, 1389) shown in Fig. 1, where the Galactic centre is in the centre of the plot. The diffuse radiation is brightest in the Galactic plane where the concentration of both bright stars and dust is greatest with extensions out from the plane in the vicinity of the Ophiuchus and Orion star formation regions. (Note that the Galactic plane was unobservable because the brightness was too great for the intensified GALEX detectors.) When we examine the diffuse background at smaller spatial scales (ApJ, 723, 1549), we find that this simple picture of light scattered from interstellar dust is incomplete as we have to include contributions from both cold gas (molecular hydrogen fluorescence) and hot gas (CIV emission). We are now engaged in detailed modeling of the UV background to understand its origin. This is one of the best ways of determining the global structure of the interstellar medium in our Galaxy.

As one of the first global views of the diffuse ultraviolet sky, this map reveals a number of other fascinating structures. Two of these are the halos around the bright stars Spica and Achernar (ApJ in press) due to the scattering of the starlight from a thin layer of dust far in front of the star. We are continuing our work on the GALEX sky and expect a number of new results from this pioneering data set.

- Jayant Murthy

Neon and CNO Abundances for Extreme Helium Stars - A Non-LTE Analysis

The principal class of hydrogen-deficient supergiant stars comprises three subclasses which in order of increasing but overlapping temperature intervals from coolest to hottest are the H-deficient carbon stars (HdC), the R Coronae Borealis stars (RCB), and the extreme helium stars (EHe). A common supposition is that the three subclasses are related in terms of origin and evolution. The origin of these very rare stars has long been disputed but it now seems likely that the majority are formed through a merger of an He white dwarf (WD) with a C-O WD, the so-called double-degenerate (DD) scenario. Others may be the result of a final He-shell flash in a post-asymptotic giant branch (post-AGB) star, the so-called final flash (FF) scenario. Much of the evidence for deciding whether HdC, RCB, or EHe stars come from the DD or FF scenario (or neither) depends on comparison of the observed chemical composition with predictions by the two scenarios. It is in this context we have presented a non-LTE (NLTE) analysis of the neon abundance of a sample of EHe stars where NeI lines are prominent in optical spectra. (The NLTE analyses are extended to He, C, N, and O lines.)

If reliable Ne abundances can be provided for EHes and RCBs, neon will join other abundances as clues to the origins and evolution of the H-deficient supergiants, its abundance must be determined reliably and, in this regard, the primary consideration would appear to be an adequate treatment of NLTE effects in the formation of the observable neon lines. Realization that NLTE effects are considerable for optical NeI lines arose from pioneering calculations by Auer & Mihalas for normal B-type stars. These authors showed that the Ne abundance derived by accounting for NLTE effects was about a factor of five less than that given by LTE. Not only was this the first result showing major NLTE effects on abundances for hot stars but the NLTE Ne abundance was shown to be in good agreement with that for HII regions as derived from emission lines. Given that the NLTE effects are

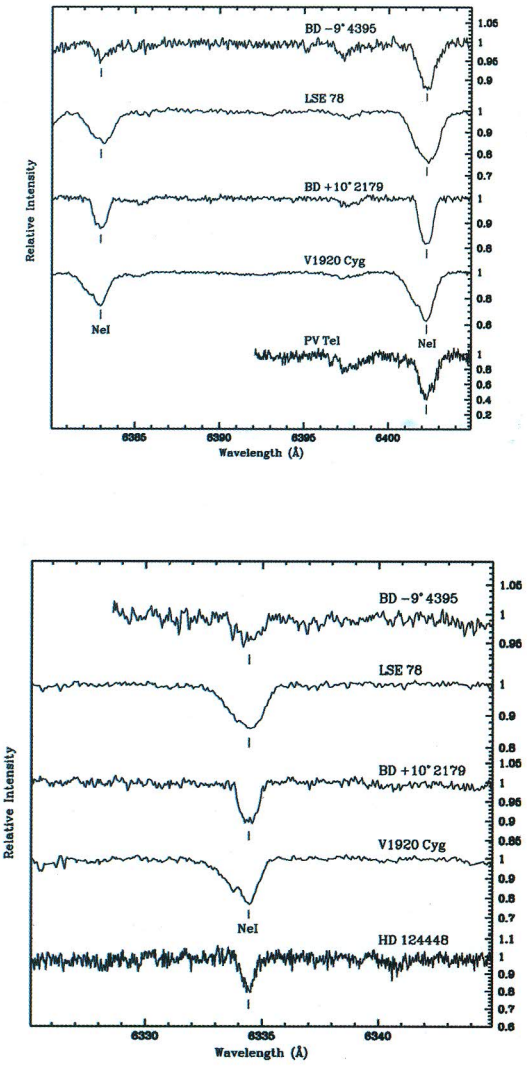


Figure 1.The sample spectra showing Ne I lines are from VBT's fiber fed echelle spectrometer - India, McDonald Observatory - USA, and CTIO - Chille.

considerable in atmospheres of stars, it became apparent that, to weigh between DD and FF scenarios would require evaluation of the NLTE effects on the observable neon lines.

We have successively described our optical spectra, the NLTE calculations including a sanity check involving our analysis of normal B stars, our abundance analyses of seven EHes, a discussion of the DD scenario with a comparison of semi-quantitative predictions with the observationally based abundances of He, C, O, and Ne.

We show that the derived abundances of these key elements, including Ne, are well matched with semi-quantitative predictions for the EHe resulting from a cold merger (i.e., no nucleosynthesis during the merger) of a He white dwarf with a C-O white dwarf. *The results are published in 2011, ApJ, 727, 122.*

- G. Pandey & D. L. Lambert

Thermal Characteristics of a Telescope Mirror

The primary mirror heating caused by the light absorption is a complex and challenging problem in solar astronomy. The thermal performance of a solar telescope mirror needs to be accurately predicted under real observing conditions. This is essential to design an efficient temperature control system required to mitigate the detrimental effects of excessive heating during the day. Temperature of the mirror rises during the day-time observations when the heat produced at the front surface is conducted to the mirror interiors. The mirror remains significantly warmer during the night as the heat is slowly diffused now from mirror interiors to outer boundaries. We have outlined an approach to study the thermal and structural response of a primary mirror under varying observing conditions. In the finite element methods (FEM) model for a 2-m class primary mirror, the location dependent solar flux and a simple physics based heating and cooling model of the ambient air temperature (see Fig. 1) was incorporated. The spatial and temporal evolution of temperature and thermal stress fields inside two well known materials for optical telescope namely, Silicon Carbide (SiC) and Zerodur were examined using 3D numerical simulations.

A 3D transient heat transfer model for Zerodur and SiC mirror was solved in two separate stages. In the first stage we computed the solution for the day-time ($6{:}00 \le t \le 18{:}00$)

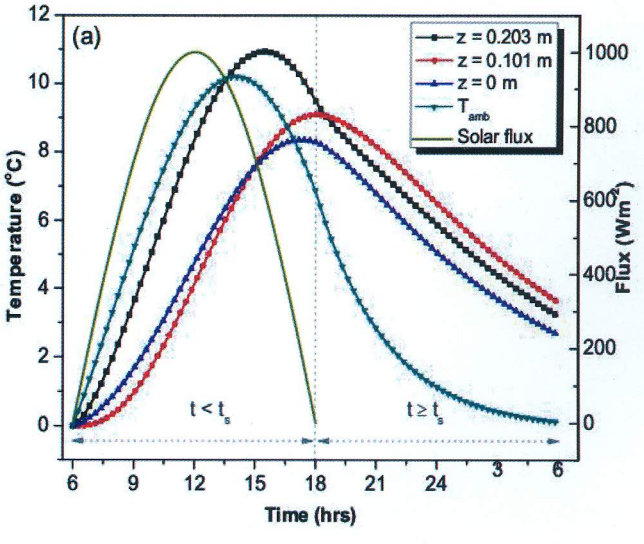


Figure 1. Model input for the daytime solar flux and resultant variations in the temperature of Zerodur mirror at different axial locations.

IIA Research Publications

January--March 2010* §

(1) Singh, J., Hasan, S. S., Gupta, G. R., Nagaraju, K., Banerjee, D., 2011, Sol. Phys.,36. *Spectroscopic Observation of Oscillations in the Corona During the Total Solar Eclipse of 22 July 2009*

(2) Sahu, D. K., Gurugubelli, U. K., Anupama, G. C., *Nomoto, K., 2011, MNRAS. 383. *Optical Studies of SN 2009jf: a Type Ib Supernova with an Extremely Slow Decline and Aspherical Signature*

(3) *Jose, J., *Pandey, A. K., *Ogura, K., *Ojha, D. K., Bhatt, B. C., *Samal, M. R., *Chauhan, N., Sahu, D. K., *Rawat, P. S., 2011. MNRAS 411, 2530. *A Multiwavelength Census of Stellar Contents in the Young Cluster NGC 1624*

(4) Kumar, Y. B., Reddy, B. E., *Lambert, D. L., 2011, ApJl. 730, L12. *Origin of Lithium Enrichment in K Giants*

(5) *Garcia-Hernandez, D. A., Rao, N. K , *Lambert, D. L., 2011. ApJ. 729, 126. *Are C60 Molecules Detectable in Circumstellar Shells of R Coronae Borealis Stars ?*

(6) Sivaram, C., *Kenath, A., 2011. APSS, 91. *Enigmatic Aspects of the Early Universe: Possibility of a `Pre-Big Bang Phase'!.*

(7) *Kennedy, C. R., Sivarani, T., *Beers, T.C., *Lee, Y.S., et al. 2011, AJ. 141, 102. *[O/Fe] Estimates for Carbon-Enhanced Metal-Poor Stars from Near-Infrared Spectroscopy*

(8) *Lee, Y. S., *Beers, T. C., *Allende Prieto, C., *Lai, D.K., *Rockosi, C. M., * Morrison, H.L., * Johnson, J.L., An, D., Sivarani, T., *Yanny, B., 2011. AJ. 141, 90. *The SEGUE Stellar Parameter Pipeline. V. Estimation of Alpha-Element Abundance Ratios from Low-Resolution SDSS/SEGUE Stellar Spectra*

(9) Sampoorna, M., Nagendra, K. N., * Frisch, H., 2011, A&A. 527, A89. *Spectral line Polarization with Angle-Dependent Partial Frequency Redistribution. II. Accelerated Lambda Iteration and Scattering Expansion Methods for the Rayleigh Scattering*

(10) * Hansen, C. J., *Nordstrom, B., *Bonifacio, B., * Spite, M., et al. Sivarani, T., 2011. A&A. 527, A65. *First Stars. XIII. Two Extremely Metal-Poor RR Lyrae Stars*

(11) *Moya, A., Mathur, S., *Garcia, R. A., 2011. Sol. Phys. 268, 245 - 254. *Sensitivity of the Calculated g-Mode Frequencies to Pulsation Codes and their Parameters*

(12) *Bramich, D. M., *Figuera Jaimes, R., Giridhar, S., Arellano Ferro, A., 2011, MNRAS, 220. *CCD Time-Series Photometry of the Globular Cluster NGC 6981: Variable Star Census and Physical Parameter Estimates*

(13) Stalin, C. S., *Srianand, R., *Petitjean, P., 2011. MNRAS. 215. *X-ray and Optical Properties of Broad Absorption Line Quasars in the Canada-France-Hawaii Telescope Legacy Survey*

(14) *Cano, Z., D., ... et al. *Bersier, C. Sahu, D. K. *Alonso-Lorite, J., Anupama, G. C., ... et al. ,Gurugubelli, U.,and 44 co-authors, 2011. MNRAS, 174. *A Tale of two GRB-SNe at a Common Redshift of z=0.54*

(15) Ramya, S., *Kantharia, N. G.., Prabhu, T.P., 2011, ApJ 728, 124. *Radio Continuum and H I Study of Blue Compact Dwarf Galaxies*

(16) *Lee, B. L., ... et al. T. Sivarani and 43 co authors, 2011. ApJ, 728, 32. *MARVELS-1b: A Short-Period, Brown Dwarf Desert Candidate from the SDSS-III Marvels Planet Search*

(17) Pandey, G., *Lambert, D. L., 2011, ApJ, 727, 122. *Neon and CNO Abundances for Extreme Helium Stars -- A Non-LTE Analysis*

(18) *Brosch, N., Murthy, J., 2011. APSS, 67. *TAUVEX: Status in 2011*

(19) Choudhury, R., Bhatt, H. C., Pandey, G., 2011. A&A. 526, A97. Variable Circumstellar Activity of V351 Orionis

(20) Kariyappa, R., *Deluca, E. E., *Saar, S. H., *Golub, L. *Dame, L., *Pevtsov, A. A., Varghese, B. A., 2011. A&A, 526, A78. *Temperature Variability in X-ray Bright Points Observed with Hinode/XRT*

(21) *da Silva, R., *Milone, A. C., Reddy , B. E., 2011. A&A. 526, A71, *Homogeneous Photospheric Parameters and C Abundances in G and K Nearby Stars with and without Planets*

(22) Sivaram, C., *Kenath, A., Nagaraja, R., 2011. APSS, 48. *A Critique on Drexler Dark Matter*

(23) *Sofia, U. J., *Parvathi, V. S., *Babu, B.R.S., Murthy J., 2011. AJ. 141, 22. *Determining Interstellar Carbon Abundances from Strong-Line Transitions*

(24) *Mahapatra, U. S., *Chattopadhyay, S.,Chaudhuri, R. K., 2011 J. Comp Chemistry, 32, No. 2, 325, *Second-Order State-Specific Multireference Møller Plesset Perturbation theory: Application to Energy Surfaces of Diimide, Ethylene, Butadiene, and Cyclobutadiene*

(25) *Nayak, M. K., Chaudhuri, R. K., 2011, Phys. Rev. A, 83, No. 2, *Determination of Molecular Hyperfine-Structure Constant Using the Second-Order Relativistic Many-Body Perturbation Theory*

(26) Madhulita Das, Chaudhuri, R. K., *Chattopadhyay, S., *Mahapatra, U., S, 2011, J. Phys. B: Atomic, Molecular & Optical Phys., Vol. 44, No. 6, 065003. *Valence Universal Multireference Coupled Cluster Calculations of the Properties of Indium in its Ground and Excited States*

***Collaborators**

§ From IIA Repository

हिन्दी कार्यशाला के आयोजन

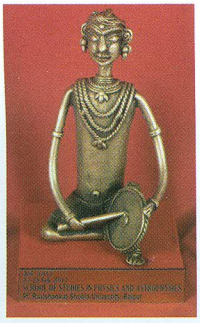
हिंदी कार्यशाला में उपस्थित कर्मचारीगण । (खड़े : बाएं से दाएं)एन. सत्यभामा, उमा माइलवेलू, विल्व कुमार, के.रंगस्वामी, वी. नटराजन, बी.प्राणेश राव, एस.धनंजया, वाई.येरप्पा, के.शंकरनारायनन्, मालिनी राजन (बैठे : बाएं से दाएं) एम.पुरुषोत्तम, पी. कुमरेसन, तथा सिवनेसन राजनटेसन

संस्थान में सुचारु रूप से हिन्दी के कार्यान्वयन तथा कार्यसाधक ज्ञान प्राप्त प्रशासनिक कर्मचारियों को हिन्दी में कामकाज करने की क्षमता को बढ़ाने के लिए दिनांक 10 मार्च, 2011 को हिन्दी कार्यशाला का आयोजन किया गया । भारतीय ताराभौतिकी संस्थान, बेंगलूर के अनुभाग अधिकारी (हिन्दी) श्री सिवनेसन राजनटेसन ने उक्त कार्यशाला का संचालन किया। उन्होंने उपस्थित 12 शासकीय कर्मचारियों को हिन्दी व्याकरण के बारे में जानकारियां दीं, जिससे वे लाभान्वित हुए।

वेणु बापू वेधशाला, कावलूर में कार्यरत शासकीय कर्मचारियों हेतु हिन्दी प्रशिक्षण कार्यक्रम का शुभारंभ दिनांक 14 मार्च 2011 को किया गया।

सिवनेसन राजनटेसन
अनुभाग अधिकारी (हिन्दी)

Felicitation



Sandra Rajiva was felicitated at the 29th Meeting of the Astronomical Society of India held at the School of Studies in Physics and Astrophysics, Pt Ravishankar Shukla University, Raipur during February 23 - 25, 2011. This is in recognition of her fruitful association with the Bulletin of the ASI for nearly 25 years. She was honoured with a memento, a citation and a shawl.

Memento received by S. Rajiva

Award

Sowmya receiving the award at the convocation

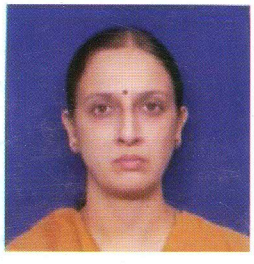
K. Sowmya, a Junior Research Fellow at IIA, obtained her Master's degree in Physics in 2010, securing the first rank from Bangalore University. She was awarded six gold medals during the forty sixth annual convocation of the Bangalore University held on 15th February, 2011

Farewell

IIA wishes all the best to ...

... Prof. Jagdev Singh joined IIA in 1974 retired as Senior Professor on 31st January, 2011 on attaining superannuation at the age of 62. His position has been extended as Visiting Professor for two years to work on development and fabrication of the solar space coronagraph and completion of digitisation of solar archives at Kodaikanal.

... Prof. M. V. Mekkaden joined the Institute in1975. He has been elevated to various positions and retired as Associate Professor on attaining the age of superannuation on 31 st January, 2011.



... Dr. Varsha Chitnis joined the IIA as Associate Professor on 1st September, 2009. She has been relieved on 28th January, 2011 on acceptance of her resignation from the services of IIA to take up the position of Reader F at TIFR Mumbai.

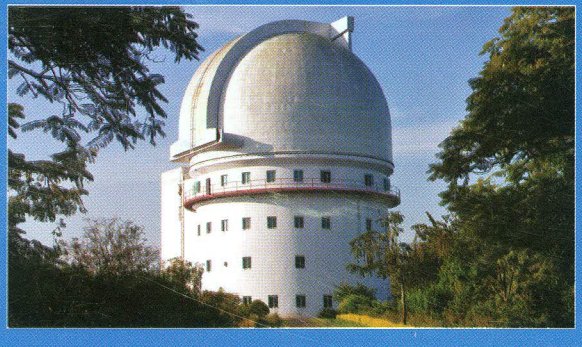
... Mr. Mohammed Khaleel joined the Institute at Gauribidanur in 1985 and retired as Chowkidar D on attaining the age of superannuation on 31st January, 2011.

... Mr. M. Chinnaraj working as Junior Technical Assistant at VBO, Kavalur retired from the services of IIA on the afternoon of 28th February, 2011 on attaining the age of superannuation. He joined VBO, Kavalur IIA in 1978.

New Appointment

IIA welcomes ...

... Mr S. Rajanatesan has joined this Institute on 6th January, .2011 as Section Officer (Hindi). He is an MPhil in hindi.



RECENT ADVANCES IN STAR FORMATION: OBSERVATIONS AND THEORY

(Part of the Silver Jubilee celebration of the Vainu Bappu Telescope)

Dates : 28 June - 01July 2011
Venue : Indian Institute of Astrophysics, Bangalore

Contact:
purni@iiap.res.in
Sumedh_a@iiap.res.in

Chandrasekhar Post-Doctoral Fellowship

The Director, IIA invites applications from exceptionally bright candidates with outstanding academic credentials for the award of 'Chandrasekhar Post-Doctoral Fellowships' in all areas of astrophysics. Applications are accepted at any time of year. The fellowship is for an initial period of two years, extendable to three, with a minimum monthly stipend of Rs.25,000/-, an annual contingency grant of Rs.1,00,000/-, housing and medical benefits, and support for travel to Bangalore. More details are at http://www.iiap.res.in/postdoc.htm.

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