आईआईए न्यूज़लेटर

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## In this issue...



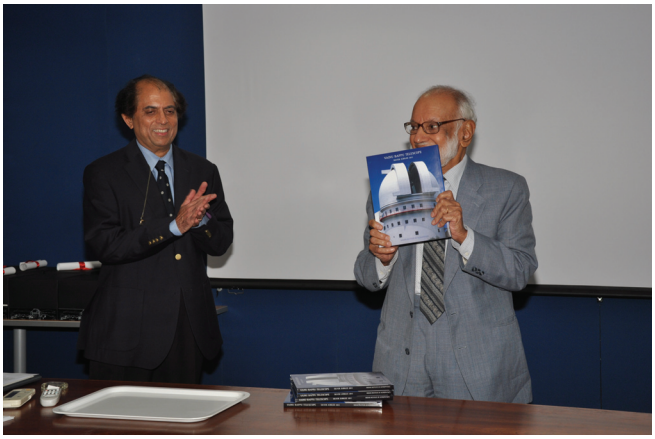
## Vainu Bappu Telescope Silver Jubilee Meeting

*S. S. Hasan, presenting a model of the Vainu Bappu Telscope to M.G. K. Menon during the Silver Jubilee Meeting of the Vainu Bappu Telescope.*

A meeting to commemorate the Silver Jubilee of the Vainu Bappu Telescope was held during 10 - 12, August 2011. The 2.3 metre telescope was built over the years 1978 to 1985 and was dedicated as the Vainu Bappu Telescope by the late Shri Rajiv Gandhi on the 6th of January 1986. Twenty five years have passed and the VBT still remains the largest optical facility in the country.

The dream of late M. K.Vainu Bappu, of an optical telescope of sizeable aperture in India had its origins soon after he took charge as the Director of the Kodaikanal Observatory. The Indian Institute of Astrophysics itself was formed to embark on new initiatives in optical astronomy. The founding Governing Council of the Institute, led by M.G. K. Menon gave unstinting support and guidance to Vainu Bappu to commence building the 90 inch telescope as it was referred to in those days. The telescope project was exemplary in demonstrating the synergy of national laboratories and private industry in building a state of the art facility with comparatively meagre resources.

The meeting was inaugurated by S. S. Hasan, Director, IIA. The chief guest for the event was M.G. K. Menon. Menon was the founder chairman of the Governing council of the Institute in 1971 and he held



*Menon releasing the commemorative volume on VBT.*

*Yemuna Bappu, M. G. K. Menon, S. S. Hasan and Indu Menon at the exhibition held at the Library at IIA, Bangalore.*

this position for two decades. The founders day of the Institute is celebrated on the 10th of August every year, as it is the birthday of the founder director M. K. Vainu Bappu. The meeting started with Menon and Hasan garlanding the bust of Bappu. A commemorative volume on VBT, which was specially prepared for the occasion was released by Menon. This volume was distributed to all the participants of the meeting. Menon delivered the founder's day lecture titled *The Founder of IIA - Vainu Bappu: Many Memories and the Lessons we can Learn from Him*. In his talk, Menon remembered his association with Bappu, a truly great man of visions and dreams for the country, from the first time he met him in the late 1950s. He recalled the days when Bappu gave lectures on Astronomy and Astrophysics at the invitation of Vikam Sarabhai at the Physical Research Laboratory and how much he learned from these lectures. He talked about similarities between Vainu Bappu and Homi Bhabha, their meetings and discussions, as well as the admiration of Bappu for Homi Bhabha. He also pointed out the responsibility of the younger generation to carry forward Bappu's vision for optical astronomy in the country.

*Participants at the VBT observing floor, Kavalur*

After the lecture, a model of the VBT was presented as a memento to Menon. Mementos were also presented to several dignitaries who contributed to the making of the VBT. The mementos for Bappu and Bhattacharyya were received by Mrs.Yemuna Bappu and Mrs.Indira Bhattacharyya respectively. A. P. Jayarajan, A. K. Saxena, B. N. Karkera (on behalf of the BARC team), B. Mallikanadh, S. C. Tapde, A. K. Pati (on behalf of the IIA team), representative from Tata Consulting Engineers (TCE) and Walchandnagar Industries also received mementos.

After the inaugural session, the meeting had scientific sessions with talks highlighting the science done with the VBT over the years, as well as sessions recalling technical and historical aspects of the VBT project itself. Wide range of topics, including solar system science, young stellar objects, eruptive variables, stellar abundances, star clusters, galaxies and AGN, were presented in 20 talks spread over six sessions. One session was dedicated to the making of the VBT, which had 4 talks. The first two days of the meeting had evening lectures. David Lambert *(Dept of Astronomy, University of Texas, Austin, USA)* gave a talk titled *In my Craft or Sullen Art* on the evening of August 10th, followed by a talk titled *Chance and Accident in Astronomy* by J.V. Narlikar on the evening of August 11th, 2011.

The participants travelled to the Vainu Bappu Observatory, Kavalur on the third day. Two sessions were held on the observing floor of the VBT. The first session was titled *Reminiscences of the VBT Project*, which had three talks. The second session was titled *Future Perspectives*, which had 4 talks.

The meeting was attended by several scientists who have used the telescope and those who were involved in the making of the telescope, with the number of participants touching 150. The meeting provided a heartening get together for people who were associated with the building of the telescope. New generation of young astronomers could take a glimpse of the struggle and success in the making of a indigenous telescope and the researchers had an atmosphere for fruitful, detailed discussions and future collaboration.

*-Annapurni Subramaniam*

## Meeting on Recent Advances in Star-Formation : A Brief Report

The first of the two meetings to mark the silver jubilee of the Vainu Bappu Telescope (VBT), titled *"Recent advances in star formation: Observations and Theory"* was organized at the Bangalore campus between the 28th June and 1st July. This meeting brought together leading researchers in the area of observational and theoretical star-formation from within, and outside India. The director, Siraj Hasan, and the Dean of the faculty, Harish Bhatt, gave relentless support for the organization of the meeting.

A team comprising of Sumedh Anathpindika, Mousumi Das, and Padmakar Parihar led by Annapurni Subramaniam organised the conference. The conference was principally funded by the Indian Institute of Astrophysics, and some partial financial supprt was extended by the Department of Science & Technology.

The theory of star-formation, as is perhaps well-known, presents a paradox; while on the one-hand the physical processes leading to stellar birth are much better understood now, the physical properties of star-forming regions, hitherto less-known, are only being unraveled over the last few years through a number of detailed observational surveys at a number of wavelengths. The enormous volume of data available today has therefore significantly advanced our understanding of the subject. The data collated from the Herschel and Spitzer space observatories in the recent past, and the anticipation of the ALMA telescope has provided an impetus to the global star-formation community which has catapulted in to a number of conferences dedicated to various aspects of the subject. Encouraged by these activities on the global scale, we decided to have one here, at the IIA.

The conference was conducted over a span of 4 days, comprising of 7 sessions with each dedicated to a certain aspect of star-formation. The scientific remit of this

*Deirdre Coffey from the Dublin Institute of Advanced Studies presenting an evening talk titled, "Disks and jets in young stars: Observations and unsolved problems", as part of the conference*

*A scene of active discussion during the star formation meeting.*

meeting, attended by 60 researchers including a substantial number of research students, extended over several, if not all areas of research on the subject of star-formation. Close to a dozen posters were also presented and viewed alongside the main conference proceedings that extended over 7 sessions during which, 29 oral presentations were made. The customary evening guest lecture, on this occasion, was delivered by one of our overseas participants, Dr. Deirdre Coffey, on molecular outflows and jets from young stellar objects.

Subjects discussed at the meeting thus, included early stages of stellar birth starting prestellar cores; jets and outflows, accretion disks and formation of dwarfs were also discussed. In this regard, new results about young star-forming regions from the Herschel space telescope were also presented. Episodes of stellar birth triggered by ionising radiation though, received extensive attention at the meeting and a number of star-formation sites in the vicinity of HII bubbles were discussed in a sequence of talks. Also discussed in the meeting were topics related to the shock-induced assembly of gas in the dense phase where stars were likely to form. Besides the regions of isolated star-formation, clusters of stars and their properties and extending further, to the star-formation history in galactic disks including our own Galaxy, were also discussed in considerable detail in number of talks. The subject of extra-Galactic star-formation also included those galaxies that exhibit a unusually low rate of star-formation in contrast to some others, replete with star-forming regions. The conference concluded with presentations on the future prospects for Astronomy in India. Oral presentations delivered at this conference will soon be published by the Astronomical Society of India in one of its dedicated conference series.

*- Sumedh Anathpindika*

## Polarized Line Formation with *J* -State Quantum Interference in a Two-Term Atom

The linearly polarized spectrum of the Sun is formed due to coherent scattering processes in which quantum interference (Q.I) phenomena plays a vital role. The Na I $D_1$, $D_2$ and Ca II H, K are the two famous double line systems, the polarization profiles of which have remained unexplained for several decades. The Q.I phenomena arises due to interference between the fine structure levels (*J*-states). The scattering matrix for the Q.I in the presence of arbitrary strength magnetic fields was formulated in smitha et. al. (2011a) 85 years after the discovery of the Hanle effect (*m*-state interference). In Smitha et al. (2011b) we incorporate this scattering matrix into the polarized radiative transfer equation for the non-magnetic case. We assume the atmospheric slab to be isothermal with a given optical thickness. We present the scattered Stokes profiles for a hypothetical doublet at 5000 Å and 5001 Å coupled together through the *J*-state interference. The line at 5000 Å is produced by the transition $J_u$ = 3/2 to $J_l$ = 1/2 and the 5001 Å line arises due to the transition $J_u$ = 1/2 to $J_l$ = 1/2. We investigate the behavior of these Stokes profiles by varying different properties of the atmospheric slabs such as the total optical thickness, continuum opacity and the thermalization parameter.

Fig, 1 shows a comparison between the Stokes profiles computed with and without *J*-state interference. The two side peaks on either side of the

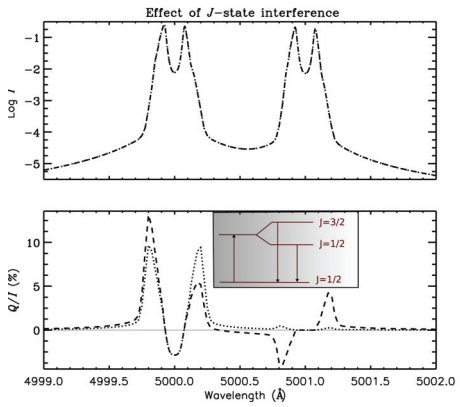



*Fig. 1.Stokes profiles computed without J-state interference (dotted line) and with J-state interference (dashed line). The optical thickness of the medium is T= 2 X $10^4$ without any background continuum. The lines of a multiplet cannot be treated independently. The inset figure shows a two-term atom showing J-state interference between the two transitions (lines).*

line center are referred to as the PRD peaks. The *J*-state interference makes these peaks asymmetric (dashed line) which otherwise would have been symmetric (dotted line). The *J*-state interference is also responsible for the sign reversal in Q/I between the two lines (at 5000.3 Å). Also the PRD peaks of the 5001 Å line become anti-symmetric and more

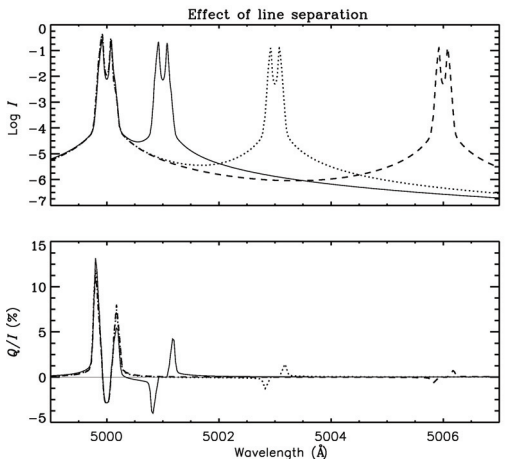



*Fig. 2. Stokes profiles showing the effect of line separation between the doublets. Three different line separations are chosen namely 1 Å(solid line), 3 Å (dotted line), 6 Å (dashed line). The other model parameters are same as in Figure 1. The strength of the quantum interference drops, as the separation increases.*

prominent due to *J*-state interference. But the intensity is not much affected.

Fig. 2 shows the effect of *J*-state interference for a doublet with different strengths of fine structure splitting. It can be seen from the figure that as the line separation increases, the effects of *J*-state interference weakens. However, the Q/I at the center of the 1/2 to 1/2 line transition remains zero because its polarizability factor is zero. Clearly the fine structure separation is a measure of the strength of quantum interference coupling. When the separation is large the effect is weak. *These results are published in Smitha et al. (2011b).*

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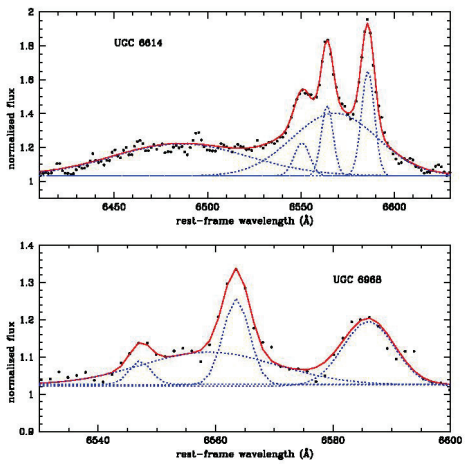
*- H. N. Smitha, K. N. Nagendra, M. Sampoorna, J. O Stenflo**

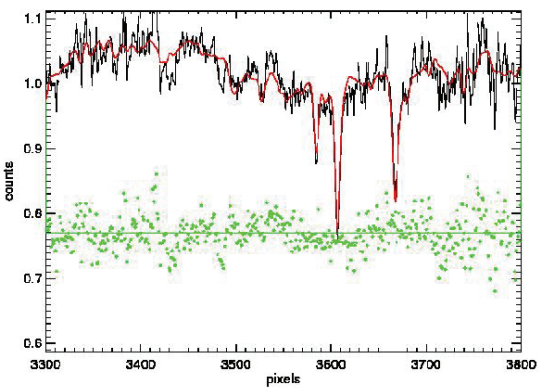
**(Collaborator)*

## AGN Activity and Black Hole Masses in Low Surface Brightness Galaxies

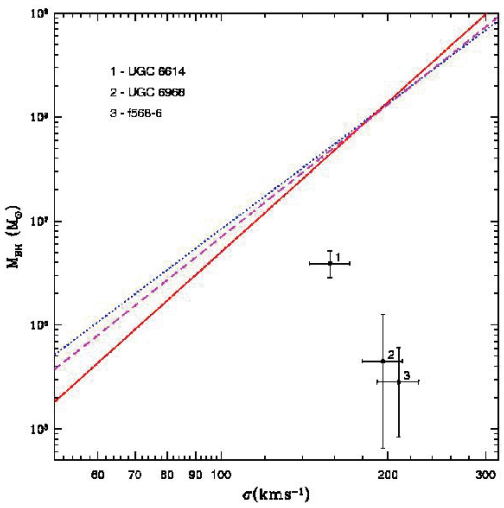
A sample of nine low surface brightness (LSB) galaxies had been observed using the 2m Himalayan Chandra Telescope. The spectra of the nuclear region of nine LSB galaxies have been obtained. In order to detect the presence of an AGN at the center of these LSB galaxies, the Hα line has been deblended into broad and narrow components (Figure 1). Four LSB galaxies from our sample, UGC 6614, UGC 1922, UGC 6968 and Malin 2 showed clear signatures of AGN activity. The black hole masses have been estimated assuming virial approximation which are in the range 3 x $10^5$ $M_\odot$ 3.8 x $10^6$ $M_\odot$. Such masses have been associated with intermediate mass black holes. These LSB galaxies have well developed bulges and their bulge stellar velocity dispersion have been estimated using Ca II Triplet lines (Figure 2). The mass of black hole and the stellar velocity dispersion together have been plotted on a M-σ plot (Figure 3). We find that all the three galaxies UGC 6614,




*The spectra showing the broad and narrow Hα components.*




*Fits for the CaII Triplet lines to estimate bulge velocity dispersion (σ) .*




*$M_{BH}$ vs σ plot for LSBs. LSBs lie below the line for normal galaxies.*

UGC 6968 and F568-6 lie below the M-σ relation for nearby galaxies. Thus we have found that although the bulges of LSB galaxies may be well evolved, their nuclear black hole masses are lower than those found in bright galaxies and lie offset from the M-σ correlation. *The results are published in MNRAS, 418, 789.*

*- S. Ramya, T. P. Prabhu, M. Das*

## Ph D awarded

S. Ramya was awarded Ph D in Physics in November 2011 by the Bangalore University, for her thesis on *A Comprehensive Study of Star Formation in Blue Compact Dwarf Galaxies.* She worked for her Ph D under the supervision of T. P. Prabhu, Indian Institute of Astrophysics.

Ramya made a detailed study of star formation properties of blue compact dwarf galaxies (BCDGs). She used the optical data of 15 BCDGs and fit the data using Starburst99 stellar population synthesis models, to study the star formation histories of these BCDGs. Star formation in BCDGs occur as bursts lasting a longer duration of ~1 Gyr followed by a short/ long quiescence. The galaxies stellar light is dominated by intermediate population of a few 100 Myr while the BCDGs masses are dominated by older population of age >4 Gyr. The BCDGs studied here are less abundant in metals when compared to sun but form a sample of higher metallicity BCDGs.BCDGs contain copious amount of HI which are 2-6 times extended than that of stellar distribution. These are converted into stars first plausibly due to galaxy-galaxy interaction and later episodes of star formation could be from stellar winds and supernovae. A few of the BCDGs reveal flatter radio spectrum, localized star formation and localized radio continuum in isolated galaxies which all lend support to stochastic self propagating star formation.

Ramya willl be joining Institut d'Astrophysique de Paris (IAP), Paris, France as a postdoctoral researcher for a period of 2 years starting from January, 2012.

## Publications*

**July - September$**

(1) Marley, M. S., **Sengupta, S**. 2011. *Probing the physical properties of directly imaged gas giant exoplanets through polarization*. *MNRAS 1398.*

(2) Arellano Ferro, A., Figuera Jaimes, R., **Giridhar, S.,** Bramich, D. M., Hernandez Santisteban, J.V., **Kuppuswamy, K**. 2011. *Exploring the variable stars in the globular cluster NGC 5024 (M53) new RR Lyrae and SX Phoenicis stars. MNRAS 416, 2265-2284.*

(3) Gopal-Krishna, Goyal, A., Joshi, S., Karthick, C., Sagar, R., Wiita, P. J., **Anupama, G.C., Sahu, D.K**. 2011. *Rapid optical variability of TeV blazars. MNRAS 416, 101-117.*

(4) **Anusha, L. S., Nagendra, K. N.** 2011. *Polarized Line Formation in Multi-dimensional Media.IV. A Fourier Decomposition Technique to Formulate the Transfer Equationwith Angle-dependent Partial Frequency Redistribution. ApJ 739, 40.*

(5) Garcia-Hernandez, A. D., **Kameswara Rao, N.**, Lambert, D.L. 2011. *Dust around R Coronae BorealisStars. I. Spitzer/Infrared Spectrograph Observations. ApJ 739, 37.*

(6) **Sengupta, S.,** Taam, R.E. 2011. *Theoretical Spectra of the AM Canum Venaticorum Binary System SDSSJ0926+3624gEffects of Irradiation onto the Donor Star. ApJ 739, 34.*

(7) Ojha, D. K., Samal, M. R., Pandey, A. K., **Bhatt, B.C.,** Ghosh, S.K., Sharma, S., Tamura, M., Mohan, V., Zinchenko, I. 2011. *Star Formation Activity in the Galactic H II ComplexS255-S257. ApJ 738, 156.*

(8) **Anusha, L.S., Nagendra, K. N**. 2011. *Polarized Line Formation in Multi-dimensional Media.III. Hanle Effect with Partial Frequency Redistribution. ApJ 738, 116.*

(9) Lai, D. K., Lee, Y. S., Bolte, M., Lucatello, S., Beers, T. C., Johnson, J. A., **Sivarani, T.,** Rockosi,C.M. 2011. *The [Fe/H], [C/Fe], and [{$ alpha$}/Fe] Distributions of the Bootes I Dwarf Spheroidal Galaxy. ApJ 738, 51.*

(10) Eisenstein, D.J., **Sivarani, T.,** with 243 colleagues listed alphabetically 2011. *SDSS-III Massive Spectroscopic Surveys of the Distant Universe, the Milky Way, and Extra-Solar Planetary Systems. AJ 142, 72.*

(11) **Javaraiah, J.** 2011. *Quasi 9and 30-40 days periodicities in the solar differential rotation. Advances in Space Research 48, 1032-1040.*

(12) **Singh, V., Shastri, P.,** Risaliti, G. 2011. *Measuring the level of nuclear activity in Seyfert galaxies and the unification scheme. A&A 533, A128.*

(13) **Banyal, R. K., Ravindra, B**. 2011. *Thermal characteristics of a classical solar telescope primary mirror. New Astronomy 16, 328-336.*

(14) **Anathpindika, S.** 2011. *On the propensity of the formation of massive clumps via fragmentation of driven shells. New Astronomy 16, 323-327.*

(15) **Sumangala Rao, S., Pandey, G.,** Lambert, D.L., **Giridhar, S.** 2011. *Is the Post-AGB Star SAO40039 Mildly Hydrogen-Deficient?. ApJ 737, L7.*

(16) **Anusha, L.S., Nagendra, K. N.,** Bianda, M., Stenflo, J.O., Holzreuter, R., **Sampoorna, M**., Frisch, H., Ramelli, R., **Smitha, H.N.** 2011. *Analysis of the Forward-scattering Hanle Effect in the Ca I 4227A Line. ApJ 737, 95.*

(17) **Raju, K.P.,** Chandrasekhar, T., Ashok, N. M. 2011. *Analysis of Coronal Green Line Profiles Evidenceof Excess Blueshifts. ApJ 736, 164.*

(18) **Sivaram, C.**, Arun, K. 2011. *Some enigmatic aspects of the early universe. Astrophysics and Space Science 334, 225-230.*

(19) **Anathpindika, S.** 2011. *India's tryst with modern astronomy. Astronomy and Geophysics 52, 040000-4.*

(20) **Singh,V., Shastri, P.,** Risaliti, G. 2011. *X-ray spectral properties of Seyfert galaxies and the unification scheme. A&A 532, A84.*

(21) **Sampoorna, M**. 2011. *Spectral line polarization with angle-dependent partial frequency redistribution. III. Single scattering approximation for the Hanle effect. A&A 532, A52.*

(22) **Banerjee, D., Gupta, G. R.,** Teriaca, L. 2011. *Propagating MHD Waves in Coronal Holes. Space Science Reviews 158, 267-288.*

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(25) Mohan, P., **Mangalam, A.**, Chand, H., Gupta, A.C. 2011. *Re-Analysis of QPO in 3C 273 Light Curve. Journal of Astronomy and Astrophysis 32, 117-120.*

(26) Haghighi, R. R., **Chatterjee, S., Vyas, A.,** Pratik Kumar, Thulkar, S., 2011, *X-ray attenuation coefficient of mixtures: Inputs for dual-energy CT. Medical Physics, Vol. 38, No. 10, pp. 5270-5279.*

(27) **Sujatha, E. R.,** Kumarvel, P., Rajamanickam, V. G. 2011, *GIS based landslide susceptibility mapping of Tevankarai Ar sub-watershed, Kodaikkanal, India using binary logistic regression analysis. Journal of Mountain Science, Vol. 8, No. 4, pp. 505-517.*

(28) Sahoo, B. K., **Das, B. P.** ,2011, *Parity nonconservation in ytterbium ion, Physical Review A, Vol. 84, No. 1, 010502(R).*

(29) Sahoo, B. K, **Das, B. P.,** 2011, *Transition properties of low-lying states in atomic indium, Physical Review A, Vol. 84, No. 1, 012501*

(30) **Akondi Vyas, M. B. Roopashree , B. Raghavendra Prasad,** *Denoising Shack Hartmann Sensor Spot Pattern Using Zernike Reconstructor, International Journal of Power Control Signal and Computation, 2, pp. 119-123, 2011.*

(31) **Akondi Vyas, M. B. Roopashree , B. Raghavendra Prasad,** *Progressive Prediction of Turbulence Using Wave-Front Sensor Data in Adaptive Optics Using Data Mining, International Journal of Power Control Signal and Computation, 2, pp. 128-131, 2011.*

(32) **Roopashree, M., Akondi, V.,** Budihal, R., *Grid size optimization for atmospheric turbulence phase screen simulations, in Applications of Lasers for Sensing and Free Space Communications, OSA Technical Digest (CD)*

*(Optical Society of America, 2011), paper JMB3.*

(33) **Vyas, A., Roopashree, M.,Prasad, B.**,*Multi-dither Shack Hartmann sensor for large telescopes: A numerical performance evaluation, in Adaptive Optics: Methods, Analysis and Applications, OSA Technical Digest (CD) (Optical Society of America, 2011), paper ATuA4.*

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(40) Rajeev Kumar Jain, **Pravabati Chingangbam,** L. Sriramkumar, 2011, *Reheating in tachyonic inflationary models: Effects on the large scale curvature perturbations, Nucl.Phys.B852, 366.*

*** Names in bold-faces are authors from IIA**

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## Madras Observatory and the Independent Discovery of Great Comet Of 1831 by T G Taylor

The Great Comet C/1831 A1 (1830 II, 1831 a) is said to have been found out as a naked-eye object in many places. The first reported observation was made by the English physicist John Herapath on 7.25 January UT, about 6 A.M. from Hounslow Heath in England. He observed it having a head as bright as a 2 mag star and a white tail 1°- 2° in length. 'The head was of the same colour as the tail, but, in proportion, far more splendid' (Herapath 1831). The comet was discovered around the same time, on 7.42 January, by R T Paine from Boston, and subsequently by others (vide Vsekhosvyatskii 1964; Kronk 2003). The comet had passed its perihelion on Dec 28.1604, 1830. It passed closest by the Earth on Dec 9, 1830 from 0.6856 AU and on Feb 16, 1831 from 0.5335 AU (JPL Small-Body Database Browser). G Santini who saw the comet first on 8 January in Padova noted that the comet was visible to the unaided eye through most of the month of January. N Cacciatore saw the comet from Palermo on the morning of 23 January having a bright nuclear condensation about 20" across embedded in a 3' nebulosity, with a tail 3 deg long. The Great Comet was last observed on 19.8 March, 1831 (Kronk 2003).

Thomas Glanville Taylor (1804-48) at the Madras Observatory was an independent discoverer of the Great Comet of 1831. In the times, Taylor was Astronomer to the East India Company's Observatory at Madras during the years 1830-48. He discovered the comet the same day, in fact on 7.0097 January, 1831 UT, and carried out its observations until 20 February 1831 (see Kapoor 2011 for details). He reported his observations (Taylor 1832) as follows:

'1831, 7th January at 4h 50m. A.M. Saw a Comet toward the East about 20 degrees high but approaching twilight prevented observation.

8th January, 5h. A.M. Adjusted the five feet Achromatic by Dollond as an Equatoreal, saw the Comet with a power of 60 but it was too faint to allow the field being illuminated, the following observations were made, at the time of its occupying the centre of the field of view.'

Using Antares as a comparison star, Taylor recorded the Sidereal Time and the Horary Circle and Declination Circle measures of the 8 January, 5h A.M. observations and entered his remarks for the comet so - 'Very faint, tail 4° long observations not to be depended upon to 5m'. From the true altitudes and azimuths, Taylor provided in a table the mean time, RA and NPD for the period 8 January – 20 February 1831. The positions published by Taylor for the

various dates are close to those we can generate for the comet using JPL's Horizons On-Line Ephemeris System (http://ssd.jpl.nasa.gov/). In his report, Taylor did not provide the Comet's orbital elements though. Just for reference here, the comet is parabolic, with q= 0.125887 AU, i= 135°.2630 and e=1.0.

T G Taylor deserves full credits for the independent discovery of the comet C/1831 A1 though his reporting has gone unnoticed. These were the times before the advent of the telegraph and communications to a distant England took rather long. Taylor does not provide hand drawings to illustrate the appearance of the comet how it looked at different times. The book he refers to in his report, namely, the "Miscellaneous Observations", also is not traceable. Taylor's first paper in the MNRAS appeared in 1837, on his observations of the Halley's Comet (Taylor 1837). As Taylor initially published only in the publications of the Madras Observatory, his report on the comet of 1831 lay confined within the few pages of the voluminous tract of the Volume I (Taylor 1832) of the Observatory's publications.

Information about T G Taylor in the IIA Archives is rather incomplete at present. In his book, Records of the Anglo-Norman House of Glanville from AD 1050 to 1880 Glanville-Richards (1882, p. 121 to 145; http://www.glanvillenet.info/roanhg8.htm) states about T G Taylor, born to Thomas Taylor, Deputy Astronomer to the Royal Observatory at Greenwich, as follows:

'Thomas Glanville Taylor, F.R.S., born at Ashburton, 22 November, 1804, and after studying some time at the Royal Observatory under his father, during which period he gave every aid in his power to Colonel Sabine when he was engaged in his experiments. "for determinating the difference in the number of vibrations made by an invariable pendulum," and also much aided the same gentleman in his still more difficult and delicate investigation respecting "the reduction to a vacuum of the vibrations of an invariable pendulum."

Mr. T. Glanville Taylor also assisted Mr. Groombridge with the reduction of his "Catalogue of Stars within 50o of the North Pole." His ability and zeal were so much approved of by the celebrated Astronomer Royal, John Pond, Esq., F.R.S., that at that gentleman's recommendation Mr. T. Glanville Taylor was appointed in 1830 Astronomer at Madras; while in that position, he published his "Astronomical Observations" in five volumes, besides which he made a very extensive series of Meteorological and Magnetic Observations in different parts of India'.

Taylor was elected a Fellow of the Royal Society on 10 February 1842. He was also Fellow of the Royal Astronomical Society. Some more details on T.G. Taylor can be accessed in Markham (1878, p. 329-330) and in the write-up of Agnes Mary Clerke in the Dictionary of National Biography, 1885-1900, Vol 55 where it is stated that he died at Southampton on 4 May 1848 (http://en.wikisource.org/wiki/Taylor,_Thomas_Glanville_(DNB00).

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*- R. C. Kapoor*

## Outreach Programme at Merak

IIA gave a Galileoscope, educational books and DVDs for the middle school at Merak as a part of its outreach programme. A desktop projector available at the Merak field station of IIA is also being utilized for displaying astronomy and science programmes.

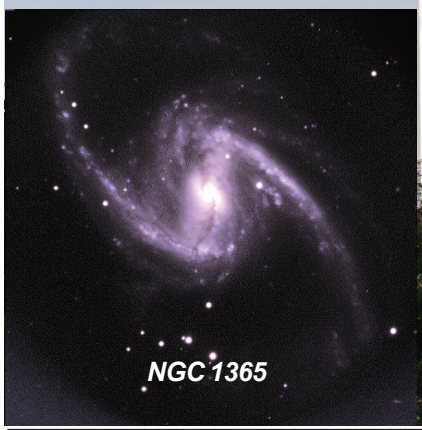
*- Namgyal Dorjay and K.E.Rangarajan*

## A Gallery of Images and Results from VBT


M51

*Galaxy images by Swara R.*


NGC 2903


NGC 1365

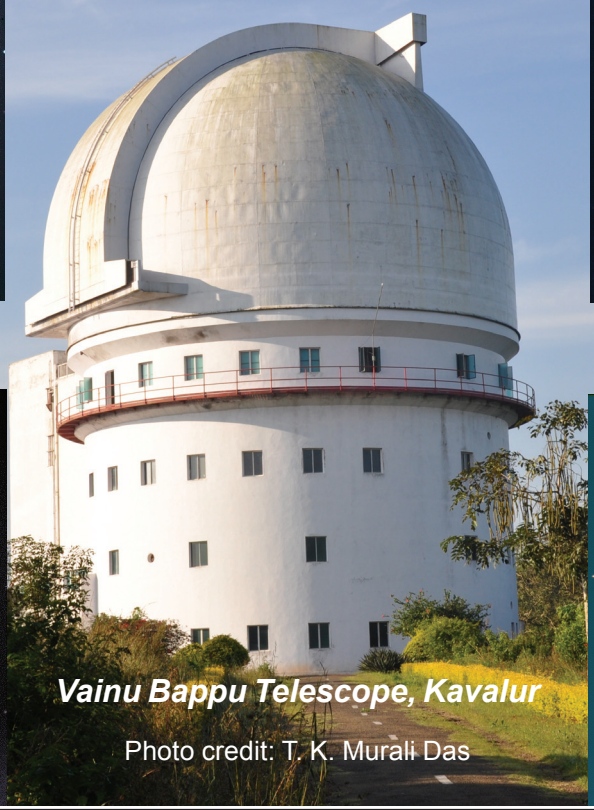
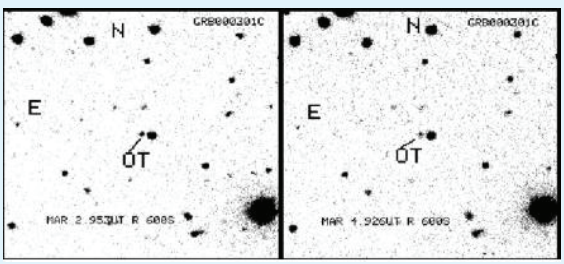
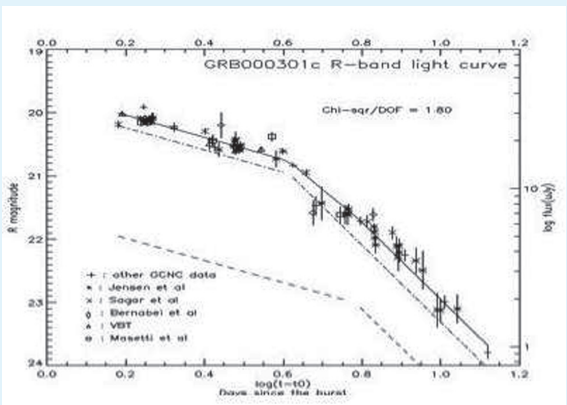

*Vainu Bappu Telescope, Kavalur*

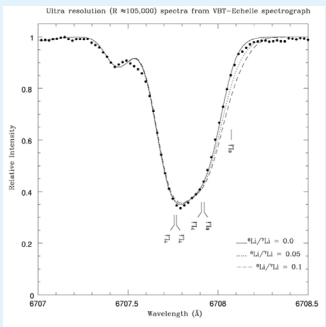
Photo credit: T. K. Murali Das


NGC 27

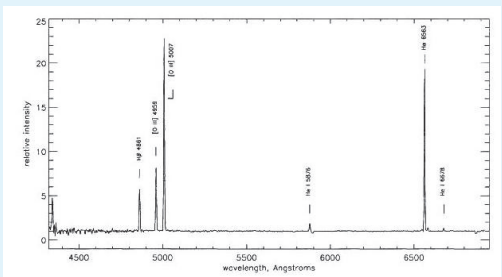



*GRB 000301C Afterglow - Bhargavi et al. 2000 ApJ, 545, 77*




*Ultr-high resolution spectrum of planet-hosting K giant.*




*Spectrum of a proto planetary nebula IRAS 17395-0842 - J. Vijapurkar et al.,1997, AJ, 114, 1573.*

## राजभाषा के क्षेत्र में उपलब्धियां

**हिंदी कार्यशाला:** संस्थान में सुचारु रूप से हिंदी के कार्यान्वयन तथा कार्यसाधक ज्ञान प्राप्त प्रशासनिक कर्मचारियों को हिंदी में कामकाज करने की क्षमता को बढ़ाने के लिए दिनांक 24 अगस्त, 2011 को हिंदी कार्यशाला का आयोजन किया गया। भारतीय ताराभौतिकी संस्थान, बेंगलूर के अनुभाग अधिकारी (हिंदी) श्री सिवनेसन राजनटेसन ने उक्त कार्यशाला का संचालन किया। उन्होंने उपस्थित 13 प्रशासनिक कर्मचारियों को हिंदी दिवस का महत्व तथा हिंदी पखवाड़े के दौरान आयोजित की जाने वाली प्रतियोगिताओं के संबंधित जानकारियां दीं जिससे वे लाभान्वित हुए।

दिनांक 24 अगस्त, 2011 को आयोजित हिंदी कार्यशाला में प्रशासनिक अधिकारी के साथ उपस्थित कर्मचारीगण

### हिंदी पखवाड़ा व हिंदी दिवस समारोह – 2011

**भातास, बेंगलूर:** संस्थान में दिनांक 02 सितंबर, 2011 से 14 सितंबर, 2011 के दौरान हिंदी पखवाड़ा का आयोजन किया गया। उक्त के दौरान शासकीय कर्मचारियों को राजभाषा हिंदी के प्रति रुचि यथावत बनाए रखने के लिए निम्नवत छः प्रतियोगिताएं आयोजित की गईं नामतः हिंदी वर्गपहेली, हिंदी वाद-विवाद, हिंदी गान, तस्वीर क्या बोलती है, हिंदी प्रश्नोत्तरी तथा हिंदी सुलेख प्रतियोगिताएं। 14 सितंबर 2011 को हिंदी दिवस भव्य रूप से मनाया गया। इस समारोह की अध्यक्षता आचार्य एस.एस. हसन, निदेशक महोदय ने की। उन्होंने सभी कर्मचारियों से यह आशा व्यक्त की कि सरकारी कामकाज अधिकाधिक हिंदी में निष्पादन करने का प्रयास करे। तदोपरांत अध्यक्ष महोदय ने उक्त प्रतियोगिताओं के विजेताओं को अनुमोदित राकेड़ पुरस्कार व प्रशस्ति पत्र प्रदान किया। श्री सिवनेसन राजनटेसन, अनुभाग अधिकारी (हिंदी) ने धन्यवाद ज्ञापन प्रस्तुत किया तथा तत्पश्चात हिंदी दिवस समाराहे सुखद सुपन्न हुआ।

दिनांक 14 सितंबर, 2011 को आयोजित हिंदी दिवस समारोह में निदेशक महोदय के साथ वरिष्ठ अधिकारियों तथा कर्मचारीगण

**वेणु बप्पु वेधशाला, कावलूर :** दिनांक 16 सितंबर, 2011 को हिंदी पखवाड़ा -2011 के समारोह के संबंध में निम्नवत दो हिंदी प्रतियोगिताएं आयोजित की गईं नामतः प्रशासनिक शब्दावली तथा हिंदी प्रश्नोत्तरी प्रतियोगिताएं। तदोपरांत प्रतियोगिताओं के 08 विजेताओं को क्षेत्रीय केन्द्र के आवासीय वैज्ञानिक डॉ. मुत्थुमारियप्पन ने अनुमोदित रोकड़ पुरस्कार वितरित किए।

दिनांक 16 सितंबर, 2011 को आयोजित हिंदी पखवाड़ा-2011 के समारोह में(बाएं से दाएं) डॉ. मुत्थमाारियप्पन, आवासीय वैज्ञानिक के साथ वेल्ले सेल्वी, श्रीनिवासराव, पन्नीरसेल्वम, सिवनेसन राजनटेसन(भातासं) तथा सुब्रमणि।

श्री सिवनेसन राजनटेसन
अनुभाग अधिकारी (हिंदी)

## Recognition by OSA: A. Vyas

*Vyas Akondi was the recipient of the 2011 Robert S. Hilbert Memorial Student Travel Grant, given by the OSA Foundation (OSAF)*

Vyas Akondi was the recipient of the 2011 Robert S. Hilbert Memorial Student Travel Grant, given by the OSA Foundation (OSAF) for the Imaging and Applied Optics: OSA Optics and Photonics Congress. Akondi presented two papers, "*Evaluation of the performance of centroiding algorithms with varying spot size: case of WFS calibration for the TMT NFIRAOS"* and *"Multi-dither Shack Hartmann sensor for large telescopes: A numerical performance evaluation", at Adaptive Optics: Methods, Analysis and Applications (AO)* which took place July 10 – 14 in Toronto, Canada. Akondi was formally recognized during a lunch held on July 12.

## Farewell

***IIA wishes all the best to ...***

**...**Dr. A. K. Saxena who joined the services of IIA as Research Associate on 19.03.1974, was elevated to various positions, retired as Engineer 'G' at Bangalore on 31.07.2011 on attaining the age of superannuation extended upto 62 years.

**...**Mr. A. P. Balakrishnan who joined IIA, Bangalore on 28.04.1980 as Helper B retired as Sr. Technical Asst. 'B' on 31.7.2011 on attaining the age of superannuation.

**...** Mr. A. Vincent who joined the services of IIA at Kodaikanal as Telescope helper on 28.04.1980 retired as Admin. Assistant on 31.07.2011 on attaining the age of superannuation.

**...**Mr. M. Malleshaiah who joined IIA, Bangalore as Chowkidar on 05.11.1975 was elevated to various positions. He expired on 19.07.2011 due to cancer. He was holding the position of Junior Technical Assistant 'B' on the date of death.

**...** Mr. M. Subramani who joined the services of IIA, Bangalore on 05.07.1978 as Telescope Helper, was elevated to various positions. He opted for voluntary retirement on personal grounds and was accordingly relieved on 31.07.2011. He was holding the position of Sr.Chowkidar 'B' on the date of retirement.

## 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 the year. The fellowship is for an initial period of two years, extendable to three, with a monthly stipend of Rs.50,000/- to Rs. 55,000/- for candidates with up to 2 years post-doctoral experience and Rs 55,000/- to 60, 000/- for those with more than two years experience. An annual contingency grant of Rs.2,00,000/-, 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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