

BULLETIN OF THE ASTRONOMICAL SOCIETY OF INDIA

Volume 33

Number 3

2005 September

CONTENTS

RESEARCH ARTICLES

- 265 **P. Venkatakrishnan, R. Sridharan and S. K. Gupta** : Imaging with insolated mirrors
- 275 **Suresh Chandra, Pramod G. Musrif and Lalan Prasad** : Coronal heating efficiency for resonant (A.C.) and non-resonant (D.C.) mechanisms
- 283 **PROCEEDINGS OF THE 23rd MEETING OF THE ASI**
(*Guest Editors : K. Subramanian and D. J. Saikia*)
- 285 **Contents Continued**
- 295 **Foreword**

PRESIDENTIAL ADDRESS

- 297 **S.N. Tandon** : New opportunities for Indian space astronomy

THESIS TALKS

- 303 **Manojendu Choudhury** : Hard X-ray and soft gamma ray properties of cosmic sources
- 307 **Santabrata Das** : Analytical studies of standing shocks in accretion flows around compact objects
- 311 **Priya Hasan** : Near infrared photometry of the young clusters NGC 1960, NGC 2453 and NGC 2384
- 317 **Santosh Joshi** : Studies of chemically peculiar stars
- 323 **Mehul Mehta** : Solar coronal rotation and phase of solar activity cycle
- 327 **Manoj Puravankara** : Star formation : circumstellar environment around Young Stellar Objects
- 333 **B. Ravindra** : Evolution of magnetic fields in the solar atmosphere

ISSBN 0304 - 9523

Edited and published by G.C. Anupama, Indian Institute of Astrophysics, Bangalore 560 034, for the Astronomical Society of India, and typeset and printed at Vykath Prints Pvt. Ltd., Airport Road Cross (opp ISRO), Bangalore 560 017.

CONTENTS CONTINUED

337 **ABSTRACTS OF TALKS**337 **ORAL PRESENTATIONS**337 **Sun : structure and dynamics of the solar atmosphere**

Shibu K. Matthew : 3-d structure of Sunspots

Wolfgang Kalkofen : Is the chromosphere always hot, or mostly cold ?

S. S. Hasan : Dynamics of the magnetized solar atmosphere

Dipankar Banerjee : Transition region dynamics

P. K. Manoharan : Imaging solar coronal mass ejections from Sun to 1 AU: predicting their arrivals at earth

340 **Stars/ISM/galaxies**

N. M. Ashok : Infrared studies of novae

Anandmayee Tej : Recent results from infrared and radio observations of massive star forming regions

Sujan Sengupta : Brown dwarfs : the missing link between stars and planets

Manojendu Choudhury : Cygnus X-3: a phenomenological perspective

Brijesh Kumar : Wide field multi-object cluster spectroscopy

Alain Lecavelier des Etangs : Planetary transits: a first direct view of extrasolar planets

Ranjeev Misra : The effect of non-thermal protons on the high energy spectra of black hole binaries

Annapurni Subramaniam : Is the Large Magellanic Cloud a double barred galaxy ?

B. Eshwar Reddy : Abundance survey of Galactic disk : thin versus thick disks

Alok Chandra Gupta : Variability of active galactic nuclei

Russell Cannon : The 2SLAQ luminous red galaxy survey

345 **Radio astronomy mini symposium**

Yashwant Gupta : Pulsar studies with GMRT : some recent results

B. C. Joshi, M. A. McLaughlin, A. G. Lyne, M. Kramer, D. R. Lorimer, R. N. Manchester, F. Camilo, M. Burgay, A. Possenti, N. D'Amico and P. C. C. Freire : Multifrequency observations of double pulsar J0737-3039 using GMRT

Poonam Chandra, Alak Ray and Sanjay Bhatnagar : Radio studies of supernovae

D. Anish Roshi : High frequency carbon recombination lines as a probe to study the environment of ultra-compact HII regions

K. S. Dwarakanath : Galactic halo HI clouds : recent GMRT results

Dipanjan Mitra : The magnetic field in the Milky Way

Ayesha Begum : Dwarf galaxies

Amitesh Omar : Galaxy evolution in low density environments

349 **Cosmology**

Shiv Sethi : CMBR anisotropies : from WMAP to Planck

T. R. Seshadri : CMB polarization

Tarun Deep Saini : Probing dark energy

H. Chand, R. Srianand, P. Petitjean and B. Aracil : Does the fine-structure constant vary?

Suparna Roychowdhury : Active galaxies and ‘entropy floor’ in galaxy clusters

351 **Future facilities**

P. C. Agrawal : The Indian multiwavelength astronomy satellite ‘ASTROSAT’

S. K. Ghosh : Future spacebased IR spectrometer

A. K. Kembhavi and Jayant Gupchup : Virtual observatory capabilities

Rekshesh Mohan : Preparing for new UV space missions at IIA

Ram Sagar : One-meter class optical telescope for early and fast observations of GRB afterglows

P. Venkatakrisnan : Experiments and design activities for the multi application solar telescope

354 **POSTER PRESENTATIONS**

354 **Sun and solar system**

Bhuwan Joshi, P. Pant and P. K. Manoharan : Statistical study of $H\alpha$ flares during the current solar cycle

Hari Om Vats : Colour and correlation analysis of shadow-bands observed during total solar eclipse of 23 November 2003 at the Indian Antarctic Station, Maitri

B. Ravindra : Relationship between speed of CME and GOES X-ray peak flux

- B. Ravindra** : On the correlation between He II 304 Å and He I 10830 Å network cells
- B. Ravindra and Brajesh Kumar** : A study of the effect of flare on acoustic oscillations using wavelet analysis
- K. M. Hiremath, M. R. Lovely and R. Kariyappa** : Solar abnormal activity during Oct.-Nov. 2003
- Koshy George and T. Chandrasekhar** : H₃⁺ in Jovian aurorae
- K. Chenna Reddy, D. Venkata Phani Kumar and G. Yellaiah** : MST radar observations of Perseid meteor shower 2004
- K. Nagaraju and K. E. Rangarajan** : Contribution functions for Stokes vector profiles
- Mahendra Singh, Brijesh Kumar and B.B. Sanwal** : Spectrophotometric study of the comet C/2001 Q4 (NEAT)
- Vivek Gupta and Badruddin** : Solar rotation and geomagnetic field variability : low solar activity periods
- Munendra Singh, Y.P. Singh and Badruddin** : Solar wind plasma and field variations during solar wind streams and their role in modulating geomagnetic activity
- Vaibhav A. Janve and Ashok Ambastha** : Spectral characterization of solar active region NOAA 8242 in quiet and sunspot locations
- K. M. Hiremath and K. Venkata Rama Krishna** : Some aspects of the solar core magnetic field
- P. K. Manoharan** : Anisotropy of solar wind density turbulence caused by the transients
- P. K. Manoharan** : Study of properties of coronal mass ejections from AR 9393 and AR 9415
- S. P. Rajaguru, R. L. Kurucz and S. S. Hasan** : How similar are starspots to sunspots?
- Jagdev Singh, Takashi Sakurai, Kiyoshi Ichimoto and Tetsuya Watanabe** : Complex variations in line-intensity ratio of coronal emission lines with height above the limb
- Pankaj K. Shrivastava** : Solar wind effects on cosmic ray modulation at 1AU
- A. N. Sil and P. K. Mukherjee** : Spectral properties of two electron ions of astrophysical interest under strongly coupled plasma
- Ashok Ambastha** : Magnetic evolution of super-active region NOAA AR 10486 and the large 4B/X17.2 class flare observed during October 28, 2003

R. Kariyappa, K. M. Hiremath and L. Dame : Contribution of solar chromospheric features to UV irradiance variability

R. Kariyappa and K. R. Sivaraman : Variability of CaII K emission flux over the solar cycle

Wahab Uddin, Ramesh Chandra, Bhuwan Joshi and Syed Salman Ali : Extreme level solar activity during decay phase of solar cycle 23 in October-November 2003

B. Ravindra, Ashok Ambastha and Sanjay Gosain : Preliminary results of Venus transit of June 8, 2004 observed in $H\alpha$ 6563 Å

A. Mujiber Rahman and S. Umopathy : Effects of coronal mass ejection associated with eruptive flares of the Sun

P. S. Goraya and Ravinder Singh : Brightness variations in Comet Hyakutake (C/1996 B2)

367 Stars and galaxies

David Mary : On observational detection limits in asteroseismology : a comparison between Manora Peak and Devasthal

M. Maiti, S. Sengupta, P. S. Parihar and G. C. Anupama : Observation of R-band variability of L dwarfs

Sudhanshu Barway, S. K. Pandey and Laxmikant Chaware : Long-term spot activity variation in FK Comae Berenices

P. Manoj, H. C. Bhatt and G. Maheswar : Evolution of emission line activity in intermediate mass young stars

Soumen Mondal, T. Chandrasekhar and P. K. Kikani : Angular diameters and effective temperatures of 19 evolved stars by lunar occultations

D. K. Ojha, S. K. Ghosh, A. Tej, R. P. Verma, S. Vig, G. C. Anupama, B. C. Bhatt, P. Parihar, T. P. Prabhu, U. S. Kamath and B. G. Anandarao : Post-outburst phase of the McNeil's Nebula (V1647 Orionis)

U. S. Chaubey and N. S. Kumar : Discovery of pulsations in Am Star HD25515

S. Sujatha, S. M. Sriraghavan, K. Jayakumar and G. S. D. Babu : Atmospheric extinction at the Indian Astronomical Observatory, Hanle and at the Vainu Bappu Observatory, Kavalur

S. Sujatha, S. M. Sriraghavan and G. S. D. Babu : Study of young open cluster NGC 1624 (OC1 403, Cr 53)

J. C. Pandey, K. P. Singh, R. Sagar and S. A. Drake : HD 81032 : a newly discovered RS CVn binary

- S. M. Sriraghavan, K. Jayakumar, G. S. D. Babu and S. Sujatha** : On the behaviour of chemically peculiar star HR2095
- Bacham E. Reddy and David L. Lambert** : Li-rich K giants : a few new cases
- Kameswara Rao and Bacham E. Reddy** : FIP effect in RV Tauri stars
- V. Girish, V. R. Rana and K. P. Singh** : X-ray spectroscopy of AM Her
- V. R. Rana, K. P. Singh, E. M. Schlegel and P. E. Barrett** : Chandra HETG observations of intermediate polars
- N. Kalyani** : Near infrared analysis of nearby main sequence stars
- A. K. Durgapal, A. K. Pandey and J. C. Pandey** : Search for variable stars in intermediate and old age open clusters
- Yogesh C. Joshi, Anil K. Pandey and K. Ogura** : CCD photometric study of the open cluster NGC 6611
- Sneh Lata and Ram Sagar** : Mass function study of six open clusters Be 10, Be 67, To 5 , Be 15, Be 71 and King 1
- Saurabh, A. K. Pandey, K. Ogura, H. Mito, K. Tarusava, T. Aoki and Ram Sagar** : Wide field CCD photometry of open clusters
- Annapurni Subramaniam, B. C. Bhatt and S. Ramya** : Study of emission line stars in young open clusters using slit-less spectra : NGC 663
- A. Subramaniam, D. K. Sahu, R. Sagar and P. Vijitha** : NGC 146 : a young open cluster with different ages for the low and high mass stars
- A. K. Pandey, K. Upadhyay, K. Ogura, H. Mito and Ram Sagar** : Wide field CCD photometry around open cluster NGC 1912
- K. Jayendra Baliga and D. C. V. Mallik** : Incidence of planetary nebulae in star clusters
- G. C. Anupama and P. S. Parihar** : Optical spectroscopy of the classical nova V5114 Sgr 2004
- Poonam Chandra, Alak Ray, Eric Schlegel, Firoza Sutaria and Wolfgang Pietsch** : Chandra X-ray observations of SN 1995N
- Kuntal Misra, Atish P. Kamble, D. Bhattacharya and Ram Sagar** : Multi-band optical photometry and bolometric light curve of Type Ia Supernova SN 2004S
- M. D. Pandey, A. P. Rao, R. K. Manchanda, Ph. Durouchoux, Ishwara-Chandra, V. H. Kulkarni** : Low frequency radio observations of low mass X-ray binary - Sco X-1
- H. Raichur and B. Paul** : Orbital evolution and apsidal motion in HMXB pulsars

Amrit Lal Ahuja, Yashwant Gupta, Dipanjan Mitra and Ajit K. Kembhavi : A novel technique of accurate estimation of pulsar dispersion measures

B. Bhattacharyya, Y. Gupta and J. Gil : Detailed study of the emission properties of PSR B0826–34

B. Bhattacharyya, Rajaram Nityananda and Y. Gupta : Determination of orbital parameters of binary pulsars

Subharthi Ray and A. R. Prasanna : Self lensing effects for compact stars and their mass-radius relation

Poonam Chandra, Brian Cameron, Alak Ray, Shri Kulkarni, Dail Frail and M. Wieringa : Radio afterglow of SGR 1806-20

Soumen Mondal, Sudeshna Samanta and Sandip K. Chakrabarti : Pseudo-potential approach for astrophysical fluid dynamics study

Sudeshna Samanta, Soumen Mondal and Sandip K. Chakrabarti : Pseudo-Kerr geometry

Prasad Basu and Sandip K. Chakrabarti : Gravitational wave emission from black holes surrounded by massive disks

C. K. Bhat and R. K. Kaul : Galactic diffuse VHE gamma-rays flux measurements through IACT : a simulations-based feasibility study

Samuel D. Morris : An estimate of the iron group of nuclei in primary cosmic ray flux at energies $\sim 10^{15}$ eV

Suresh C. Tonwar : A search for antiprotons in cosmic ray flux at TeV energies

A. K. Tickoo, K. K. Yadav, M. K. Koul, S. Thoudam, V. K. Dhar, K. Venugopal, N. Bhatt, S. Bhattacharyya, P. Chandra, H. C. Goyal, R. K. Kaul, M. Kothari, S. Kotwal, R. Koul, R. C. Rannot, S. Sahayanathan and M. Sharma : TeV energy spectrum of the Crab Nebula as measured by the TACTIC γ -ray telescope

Nirupam Roy, Jayaram N. Chengalur and R. Srianand : A multi-wavelength investigation of the temperature of the cold neutral ISM

Sambaran Banerjee and Pranab Ghosh : Diagnostics of the Milky Way's star formation history

Ankan Das, Sandip K. Chakrabarti, Sonali Chakrabarti and Kinsuk Acharyya : Monte Carlo simulation of molecular hydrogen formation in grain surfaces

Arpita Srivastava, Amit Pathak and Shantanu Rastogi : PAHs incorporating cyclopentadienyl ring and their astrophysical relevance

Amit Pathak and Shantanu Rastogi : Vibrational spectra of PAHs and the astrophysical IR bands

B. G. Anandarao, V. Venkataraman, S. K. Ghosh, D. K. Ojha and S. Vig : Near-infrared photometry and radio continuum observations of the massive star-forming region IRAS 21413+5442

S. Vig, S. K. Ghosh, D. K. Ojha and R. P. Verma : Infrared study of the southern Galactic star forming region associated with IRAS 14416–5937

S. Vig, S. K. Ghosh, V. K. Kulkarni, D. K. Ojha and R. P. Verma : Radio and infrared study of the region associated with the molecular cloud complex NGC 6334

A. Tej, D. K. Ojha, S. K. Ghosh, S. Vig, V. K. Kulkarni, R. P. Verma and T. P. Prabhu : Multiwavelength study of massive star forming region IRAS 06055+2039

Suresh Chandra, Pramod G. Musrif and Ram M. Dharmkare : Suggestions for an interstellar C₇H₂ search

P. P. Saxena : Production of nitric oxide (NO) in hot molecular core SgrB2(M)

Suresh Chandra, Pramod G. Musrif and Ram M. Dharmkare : Anomalous absorption in formaldehyde in cosmic objects

396 Extra-galactic astronomy and cosmology

Jayanti Prasad : Gravitational collapse in an expanding background and the effect of small scale perturbations on large scales

Saumyadip Samui, Raghunathan Srianand and Kandaswamy Subramanian : Reionization of the Universe

Neeraj Gupta, Tapasi Ghosh, S. Jeyakumar, D. J. Saikia, C. J. Salter and R. Srianand : Probing the radio source environments using absorption lines

A. Omar and K. S. Dwarakanath : The Eridanus group of galaxies : key results

Surajit Dasgupta and G. C. Dewangan : Evidence for relativistic outflow of ionized material from the nuclei of active galaxies

Ananda Hota, D. J. Saikia and J. A. Irwin : Outflows from three active galaxies : NGC1482, NGC4438 and NGC6764

K. S. Baliyan, U. C. Joshi and S. Ganesh : Monitoring of the blazars from Mt Abu IR observatory

C. S. Stalin and R. Srianand : The nature of the peculiar QSO SDSS J153259.96–003944

C. S. Stalin, Gopal-Krishna, Ram Sagar, Paul J. Wiita, V. Mohan and A. K. Pandey : Multiband optical monitoring of the blazars S5 0716+714 and BL Lacertae

Laxmikant Chaware, Sudhansu Barway, S. K. Pandey, A. K. Kembhavi and D. K. Sahu : Dust properties of NGC3801

V. N. Pandey and N. Udaya Shankar : A steradian of the southern sky from the Mauritius Radio Telescope

S. Thoudam, K. K. Yadav, R. C. Rannot, S. Sahayanathan, M. Sharma, K. Venugopal, N. Bhatt, S. Bhattacharyya, P. Chandra, V. K. Dhar, H. C. Goyal, S. Godambe, R. K. Kaul, M. Kothari, S. Kotwal, R. Koul and A. K. Tickoo : VHE observations of H1426+428 using TACTIC imaging telescope : 2004 observations

R. C. Rannot, P. Chandra, S. Thoudam, K. K. Yadav, M. Sharma, K. Venugopal, N. Bhatt, S. Bhattacharyya, V. K. Dhar, H. C. Goyal, S. Godambe, R. K. Kaul, M. Kothari, S. Kotwal, R. Koul, A. K. Tickoo and S. Sahayanathan : Study of TeV photons from Mrk 421 with the TACTIC gamma-ray telescope : 2004 observations

S. V. Godambe, S. Thoudam, R. C. Rannot, P. Chandra, A. K. Tickoo, S. Sahayanathan, M. Sharma, K. Venugopal, N. Bhatt, S. Bhattacharyya, V. K. Dhar, H. C. Goyal, R. K. Kaul, M. Kothari, S. Kotwal, R. Koul and K. K. Yadav : Recent TeV observations of 1ES2344+514 with the TACTIC telescope

D. K. Sahu and G. C. Anupama : Photometric study of Type Ia Supernova SN 2002hu

Christian Zier : On which scales jets are bent to Z-shapes?

D. K. Chakraborty, Arun Kumar Singh and Firdous : Intrinsic shapes of elliptical galaxies

U. S. Pandey and S. K. Tiwari : On the perturbation of a self-gravitating gaseous disk

Annapurni Subramaniam and T. P. Prabhu : Kinematic evidence of counterrotation in the central region of the Large Magellanic Cloud

K. S. V. S. Narasimhan, S. N. Hasan and S. M. Alladin : The dynamics of ejecting stellar systems

Kuntal Misra, S. B. Pandey, Ram Sagar and D. Bhattacharya : Recent observations of GRB afterglows from ARIES, Nainital

Debbijoy Bhattacharya and P. Sreekumar : Contribution from normal galaxies to the extragalactic γ -ray background

408 **Instrumentation**

M. L. Sapru, A. K. Tickoo, S. Thoudam, R. C. Rannot and R. Koul : Threshold energy estimates of the proposed MACE gamma-ray telescope at Hanle

Pravata Kumar Mohanty : Angular resolution of the GRAPES-3 array for UHE gamma-ray astronomy

Ginu Rajan, Jayant Murthy and B. Raghavendra Prasad : Methods to study the darkcount rate and spatial resolution of the ICCD

K. Nagaraju, K. Sankarasubramanian, K. B. Ramesh and K. E. Rangarajan : Study of modulation and demodulation schemes for a two beam polarimeter

K. B. Ramesh, K. Nagaraju, K. E. Rangarajan, K. Sankarasubramanian and J. Singh : A two-beam spectropolarimeter for Kodaikanal Tower Telescope

A. Raghunathan and N. Udaya Shankar : A non planar trapezoidal structure for broad band applications in radio astronomy

R. DuraiChelvan, M. O. Modgekar, C. M. Ateequlla and N. Udaya Shankar : Modal analysis and surface metrology of the RRI 12m preloaded parabolic dish

P. V. Rishin, Sabir Hussein Syed, J. Aruna, N. Udaya Shankar and A. Krishnan : Design of a control system for the RRI 12m radio telescope

N. Udaya Shankar, B. S. Girish, K. S. Srivani and K. S. Manjunath : Comparison of FPGA-based spectrometers using conventional Fourier transform and number theoretic transforms

A. Raja Bayanna, R. Sridharan and P. Venkatakrishnan : Phase diversity technique for high resolution solar imaging

Brajesh Kumar, R. Sridharan, A. Raja Bayanna and P. Venkatakrishnan : Preliminary results on the calibration and control of an adaptive optics system

K. G. Gupta, R. K. S. Yadav, T. Bangia, T. S. Kumar and N. Sharma : Redesigning ARIES Baker-Nunn camera for wide field CCD imaging

R. Sridharan, A. Raja Bayanna, Brajesh Kumar, P. Venkatakrishnan and C. U. Keller : An image stabilization system for solar observations

P. Venkatakrishnan, R. Sridharan and S. K. Gupta : Imaging with insulated mirrors

R. C. Rannot, A. K. Tickoo, D. Dumora, J. Procureur and R. Koul : Study of polarization and temporal properties of atmospheric Cerenkov light : simulations

417 **Erratum : Sneha Lata** : Mass function study of six open clusters Be 10, Be 67, To 5, Be 15, Be 71 and King 1 (BASI, (2005) **33**, 51–66)

419 **Society Matters**