

# Khagol

Inter-University Centre for Astronomy and Astrophysics  
An Autonomous Institution of the UGC

No. 6

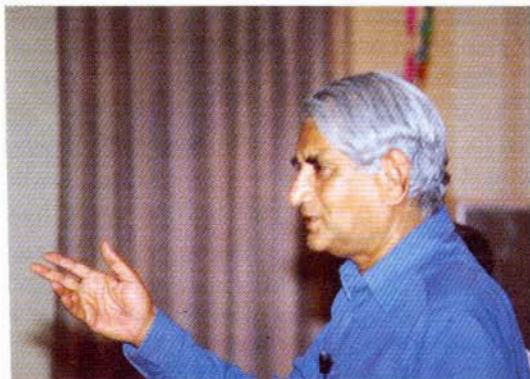
THE IUCAA BULLETIN

April 1991

## WE HAVE MOVED!

IUCAA's offices have been shifted to four houses in Akashganga, IUCAA Housing Colony. The house no. 8 has the administrative offices, while no. 9 has the library. The academics are to be found in nos. 10 and 11, the latter having a seminar room. House nos. 5, 6 and 7 will form IUCAA's Guest House. The Instrumentation Laboratory and the Computer Centre are housed in Aditi. Across the road the institutional buildings are coming up fast and we hope to move into them in early 1992.

Please note our new telephone number given at the end.



## VISITORS TO IUCAA

- Sverre Aarseth, Institute of Astronomy, Cambridge
- S. Ray, University of Burdwan, Burdwan
- Charles Correa, Architect, Bombay
- S.K. Jain, IIA, Bangalore
- A. Sen, IPR, Ahmedabad
- S.P. Pandya, PRL, Ahmedabad

## COLLOQUIA

December 12, 1990 : *I.W. Roxburgh*,  
University of London, UK

**Space experiments on gravity**

January 2, 1991 : *Emil Wolf*, University of  
Rochester, New York

**Correlation-induced frequency  
shifts of spectral lines**

January 9, 1991 : *C.N.R. Rao*, Indian  
Institute of Science, Bangalore

**Some new insights into high-temperature  
oxide superconductors**

March 4, 1991 : *Charles Correa*, Archi-  
tect, Bombay

**Transfers and transformations**

March 11, 1991 : *S.P. Pandya*, Physical  
Research Laboratory, Ahmedabad

**Radioactivity - old is beautiful**

## CONGRATULATIONS

We most heartily congratulate our neighbour Professor Govind Swarup, Director, National Centre for Radio Astrophysics (TIFR, Pune Campus) on being elected as the *Fellow of Royal Society (London)* as well as on being awarded the *R.D. Birla Prize* and the *FIE Foundation Award*. Well done, Govind, keep it up!

## FAREWELL & WELCOME

We bid farewell to Professor Yash Pal and welcome Professor Man Mohan Singh as the Chairman, UGC. We wish Yash, who cannot help throwing up new and exciting ideas, more successes in his future endeavours and we shall always look forward to his guidance and cheer-up smile. We will greatly value Professor Singh's guidance and support as the Chairman of the IUCAA Governing Body.

## VISITORS EXPECTED

- Rosanne Di Stefano, Long Island University (June-July 1991) : Chaos in Astrophysics
- Arvind Borde, Long Island University (June-July 1991) : Classical General Relativity
- S.R. Kulkarni, Caltech (July 1991) : Optical Astronomy
- A. Ashtekar, Syracuse University (December 1991 - January 1992) : Quantum Gravity

These visitors will give short lecture courses on the topics mentioned. Interested persons may request for attendance in them.

## INTERACTION WITH UNIVERSITIES

### Goa School

The Departments of Physics and Mathematics of Goa University arranged a lecture series on Astronomy and Astrophysics during January 16-19, 1991. IUCAA faculty consisting of J.V. Narlikar, N.K. Dadhich, S.V. Dhurandhar; B.S. Sathyaprakash and Ranjan Gupta covered recent advances made in the fields of cosmology, black holes, gravitational waves and instrumentation. About 50 students from the colleges and university departments in Goa attended these lectures. C. Mande and S.G. Deo took care of the local arrangements.

### Seminar

S.V. Dhurandhar participated in the seminar on *Curriculum Development in Mathematics* held at the New Arts, Commerce and Science college, Ahmednagar during February 22-23, 1991. He also delivered a popular lecture on Black Holes.

### Mini Schools and Mini Workshops

The MINI SCHOOL ON INFRARED ASTROPHYSICS was conducted in the School of Physics, Madurai Kamaraj University, Madurai during January 1-5, 1991. The participants numbering 12, were drawn from various universities, colleges and research institutes. K. Shivanandan of the Naval Research Laboratory, USA was the main lecturer and V.R. Venugopal and S. Balasubramanian took care of the local arrangements.

The thrust of Shivanandan's lectures was to present to the participants, (most of whom were uninitiated in the subject), an up to-date review of the field of infrared astrophysics and to take them on a quick grand tour of the infrared sky, highlighting, in particular the results obtained so far from the infrared astronomy satellite (IRAS) observations. He accomplished this objective through an introductory lecture covering fundamental concepts of infrared astrophysics, 6 lectures on IRAS overview, infrared stars and interstellar medium, HII regions and giant molecular clouds, galactic planes and galactic centre, extra galactic infrared astronomy and the infrared spectroscopy project of the Naval Research Laboratory. V.R. Venugopal, D.G. Banhatti, Gopal Kilambi, Sam Ragland and J.J. Rawal briefly described their current research activities.

A MINI WORKSHOP ON RELATIVISTIC ASTROPHYSICS, sponsored by IUCAA, was held at PRL, Ahmedabad, during the week 20-25 January, 1991. In order to get a working theme, the discussions were restricted to only five topics : Observational Features in High Energy Astrophysics - J.N. Desai, General Relativity and Accretion Dynamics - A.R. Prasanna, Plasma Magnetosphere - A.C. Das, Radiation Emission in Astrophysics - Vinod Krishan, and Neutron Stars : Structure and Dynamics - Bhaskar Datta. P. Bhaskaran and S.C. Tripathy each gave a seminar highlighting the methodology and results in the context of thin magnetofluid disks around compact objects.

The five day meeting thus brought to the forefront, firstly the importance of considering plasma physical concepts more thoroughly both for structure and dynamics of disks as well as in the emission features. Further, the main problems of interest that could be pursued as highlighted in the discussions concern the general relativistic features associated with dynamical and secular instabilities for rotating, ultra compact objects; the boundary layer discussions of disk - magnetosphere structure and coherent emission mechanisms due to plasma processes arising from microinstabilities.

A MINI WORKSHOP ON N-BODY SIMULATIONS IN GALACTIC DYNAMICS was held during January 16-21 in Hyderabad at the Centre for Advanced Study in Astronomy, Osmania University in the backdrop of the Gulf War.



The highlight of this workshop was a series of lectures by Sverre J. Aarseth from the Institute of Astronomy, University of Cambridge, UK, covering various aspects of computer simulations of many galactic bodies interacting according to Newtonian laws. The lectures were focussed on the huge FORTRAN code developed by him, over many years. Sverre discussed many subtleties associated with the numerical integrations, time-steps, different regularization methods developed to deal with coinciding coordinates and formation of binaries due to capturing orbits. His lectures were delivered in a pedagogical style and served as a self-contained introduction to N-body simulation.

The workshop also had lectures by K.B. Bhatnagar, R.B. Singh, Namboodiri on other aspects of the few-body calculations. On one of the evenings the participants were provided with a refreshingly delightful slide-show of African wild-life. The slides were made by Sverre himself.

### AMATEUR ASTRONOMERS' MEET

The first Amateur Astronomers' Meet was held in Pune during January 12-13, 1991 under the joint auspices of IUCAA and Jyotirvidya Parisanstha. Over 200 amateurs from all over the country attended this meet. The main objective of the meet was to help develop manpower in Astronomy and Astrophysics. J.V. Narlikar, in his welcome address, urged the amateur astronomers to educate the public on scientific explanations of phenomena in order to dispel superstitions. Rajamohan, J.J. Rawal, A. Bhatnagar, Prabhakaran Nayar, D.J. Saikia, Jacqueline van Gorkom, B.V. Sreekantan and A.K. Kembhavi spoke on different aspects of astronomy and astrophysics. About 15 papers were presented by the delegates on various aspects of amateurs' activities. The delegates had an observation session at IUCAA through its C-14 and C-8 telescopes and some astronomical films were also screened. N.K. Dadhich concluded the meet with an appeal to banks and industries to give active encouragement to amateur astronomers by sponsoring amateur astronomer groups which in turn will help them to procure observational equipments to do useful astronomical observations.

### CONDOLENCE

Professor J.N. Tandon of the Department of Physics and Astrophysics, Delhi University passed away on December 19, 1990. We offer our sincere condolences to the bereaved family and his colleagues.

### Small Automated Telescopes

The instrumentation laboratory of IUCAA is working on the development of small (~35 cm) automated telescopes. The design is based on commercially available subassemblies, e.g. optics, drive motors, photosensors etc.

To provide backlash free motion with a high resolution, the drive is based on friction gears coupled to microstepper motors. It will have a pointing accuracy of better than 3' without any external guidance. Real time guidance will be used for centering the object in the field. The telescope operation will be controlled by a pre-programmed computer and will be designed for specific application, such as photoelectric photometry.

Interested astronomers and university groups who would like to collaborate in the design, and in development of such telescopes (for their own use) using the IUCAA facilities are invited to write to Ranjan Gupta for further details and organising the requisite support.

### RESCHEDULED EVENTS

The Gulf War affected IUCAA's academic calendar quite a bit. The Mini Workshop on Image Processing scheduled to be held during February 3-8 had to be cancelled as the experts from abroad, J. Sulentic, Patricia Monger and N. Weir had to cancel their trips.

The Regional Meetings of Northern India universities at Chandigarh, Western India universities at Jaipur and Southern India universities at Trivandrum had to be cancelled at the nth hour due to the Government of India ban on meetings/conferences etc. We hope that the ban will be lifted soon after which we will announce the revised schedules.

### NEW ARRIVAL

We are happy to welcome Dr. Varun Sahni in our fold. He has joined us from CITA, Toronto.

## ADMISSION NOTICE RESEARCH SCHOLARS 1991 - 92

IUCAA invites applications for its graduate school leading to a Ph. D. in Astronomy and Astrophysics. Selection for the academic year 1991 - 92 will be made on the basis of a written test and interviews to be held in Pune sometime end June/early July 1991. The academic programme will commence in August 1991.

**Graduate School :** Selected students will undergo graduate courses in physics, astronomy and related areas for two semesters. Satisfactory completion of the courses will allow students to register for a Ph.D. programme. The graduate courses will be organised in collaboration with the National Centre for Radio Astrophysics of the Tata Institute of Fundamental Research, Pune Campus. The total duration of the programme including the graduate school will be 4 years.

**Qualification :** M.Sc. in physics/mathematics/astronomy or Bachelor's or Master's degree in engineering with adequate background in physics and mathematics. Candidates with an engineering background and interest in experimental physics are especially encouraged to apply. Candidates expecting to obtain their degrees by July 1991 may also apply. The work leading to a Ph. D. will be quite demanding, and exceptional talent and motivation are needed to complete it successfully. All selected candidates will be required to clear the UGC/CSIR NET examination within one year of admission to the research programme, if they have not already done so.

**Scholarship :** Each student will be paid a scholarship of Rs. 1,800/- p.m. for the first two years and Rs. 2,100/- p.m. for the remaining two years. In addition there will be a contingency grant of Rs. 7,500/- p.a. and other benefits including free accommodation. The continuation in the programme is however subject to satisfactory performance of the student every year.

**Application :** This is to be made in prescribed form which can be obtained by writing to THE COORDINATOR, CORE PROGRAMME, IUCAA, alongwith 24 x 11 cm self addressed stamped (Rs. 2.00) envelope. The last date for the despatch of forms will be May 1, 1991. Completed applications should arrive at IUCAA no later than May 15, 1991. Candidates called for written test and interviews will be paid 1.33 times rail fare each way by ordinary II class and a sum of Rs. 35/- as halting allowance for the day of the test and interviews. A common test and interviews may be conducted for admission to IUCAA and NCRA (TIFR).

## NATIONAL SCIENCE DAY

IUCAA celebrated the National Science Day, February 28, by organizing a Science Quiz for the school students of Pune. Eight teams from four schools participated and the first prize was won by Arati Godbole, Arohi Dharwadkar, Meenal Gad and Jayant Kulkarni of Abhinava Vidyalaya English Medium High School and the second prize was shared by the two teams of the Kendriya Vidyalaya, Southern Command. Patrick Das Gupta and B.S. Sathyaprakash planned as well as conducted the quiz.

### The Optical Depth of an Indian Kitchen

John Faulkner, Professor at the University of California at Santa Cruz tells the following true story about an Indian astrophysicist (whom we will call X).

When X and John were fellow graduate students at Cambridge, John invited X to his flat to prepare an Indian meal. As a special treat X decided to fry poori. He did not reveal to John that this was going to be his first attempt.

So he heated oil to a temperature far higher than necessary. When he tossed the first poori in, there was a loud sizzling noise accompanied by thick smoke.

John rushed in thinking that the kitchen was on fire. "Is this quite normal in Indian cooking?" he asked apprehensively. X was quite unperturbed as he looked round and replied : "Yes! This is about right. The optical depth should be unity."

### How To Communicate With IUCAA?

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