

## Report on the 20th International School for Young Astronomers.

This ISYA met at Inter-University Center for Astronomy and Astrophysics (IUCAA), Pune, India from January 3 to 21, 1994. Travel support was provided by IAU, UNESCO and ICSU. IUCAA provided local hospitality and meeting facilities in its modern complex. The ISYA was advertised in the IAU Bulletin, through national representatives of IAU Commission 46 in relevant countries, and through the journal *Khagol*, published by IUCAA, which reaches all relevant institutions in India. The most effective advertising was provided by the participants of the 1992 ISYA in China.

The director of the school, Dr. J. Narlikar, asked seven faculty members to join the school:

P. Eggleton (U.K., stellar interiors and evolution, with emphasis on evolutionary manifestations in binaries),

M. Gerbaldi (France, stellar spectroscopy, derivation of stellar parameters),

S. Isoe (Japan, observational techniques),

D. Wentzel (USA, solar physics and MHD),

and, from Pune:

T. Padmanabhan (a masterful introduction to cosmology),

A. K. Khembavi (high-energy astrophysics), and

D. J. Saikia (who substituted on short notice for Chanda Jog, interstellar matter and galaxies).

However, Khembavi and Saikia discussed almost exclusively active galaxies and quasars.

There were 35 participants, including 11 women: 10 participants (including 1 woman) were from India; the other participants came from Argentina, Bulgaria, Canada, Iran, Ireland, Korea, Nepal, Russia, Sri Lanka, Vietnam, Turkey and Ukraine. Three participants, from Canada, India, and Sri Lanka, respectively, are studying in the USA; one participant from India is studying in France. Among the foreign participants, 15 (including 8 women) received travel support; 9 of these needed to have their travel expenses refunded in US dollars cash while they were still in Pune. 10 foreign participants and one faculty member found their own travel support.

The initial selection of foreign participants for travel support emphasized reaching graduate (post-baccalaureate) students from a maximum number of different institutions. When two grants from other sources saved us money, two people with recent doctoral degrees (both from Russia) were added. It is important to offer the ISYA to beginning graduate students, since they most need to see the breadth of astronomy, but it is also important to have more experienced participants who become the scientific leaders of the school and ask questions in lectures. The questions not only demonstrate the broad range of interests among participants but also stimulate subsequent discussions. The large range in participants' backgrounds makes it difficult to give lectures appropriate for everybody. Ideally, each lecturer starts at an introductory level and yet reaches considerable depth. To do this effectively, the lecturer must be involved in the life of the group. It is disadvantageous if local faculty appear almost only

for their lectures or if foreign faculty miss the beginning of the ISYA. Two of the lecturers, having started at a suitably low introductory level, stayed at that level so that the advanced students dispersed to their individual interests. Inevitably, lectures from faculty who did reach adequate depth served mostly to provide the "flavor" of the topic for the beginners. The participants were encouraged to seek individual discussions with the faculty members, and several participants sought out particularly the Indian faculty members and J. Narlikar. One participant also had contact with engineers for very practical problems concerning CCD photometry.

Since many participants came from institutions with no or very limited astronomy research journals, they made extensive use of the excellent library. The computer center was widely used, and accounts on Sun spark stations were opened for interested students.

The language of the school was English. Since most foreign participants had little experience with spoken English, it was necessary to speak quite slowly and display the crucial words, names and phrases on overhead transparencies for visual recognition. The overheads were copied for all participants. The Indian faculty tried very hard to speak slowly and evenly, but several participants still found them very hard to understand, particularly since they placed relatively little text on overheads. The participants from the various countries integrated well already during the first week. However, it took until the third week that they discussed science with each other without being selfconscious of the English. This was also the experience at the ISYA in China in 1992. It is probably the best reason for the ISYA lasting as long as three weeks. (The more formal aspects of the school become rather exhausting after two weeks.)

There were 38 lectures of 1 to 1.5 hours, plus seminars by J. Narlikar and J. Ostriker and a presentation on the Giant Meterwave Radio Telescope (GMRT) and its astrophysical challenge by G. Swarup. Some practical exercises, including sky observing with two Celestron telescopes, were also organized. A visit to the GMRT took place one afternoon. Talks by 10 participants were given about their research; 12 participants presented brief talks concerning their observatory or university; 2 faculty gave talks to the amateur astronomical society of Pune. Several social and sightseeing events were organized as well as a weekend excursion to the painted caves and rock-cut temples of Ajanta and Ellora. (Since several foreign participants could bring no money and the trip was expensive by Indian students' standards, this excursion was possible only by the IAU supporting the entire group's travel.)

Only 2 faculty and about 2/3 of the participants could stay the entire three weeks, particularly because the Moscow-Bombay flight by Aeroflot was not even quite weekly. Thus particular emphasis was placed on integrating the participants rapidly, for instance by having participants from different countries share rooms.

The local details of the school were organized efficiently by

Mrs. S. (Lata) Shankar and Dr. N. Dadhich. E-mail was essential, especially for solving visa and travel problems and for optimum use of available travel support. The few participants without e-mail could at least be reached by fax. M. Gerbaldi (assistant secretary for ISYA) provided much valuable advice both in planning and during the ISYA.

Donat G. Wentzel, secretary for ISYA

*Donat G. Wentzel*

Budget summary:

\$ 3204 Faculty travel

\$13121 Participants' international travel (except Nepal)

\$ 2675 Estimate of costs to be billed by IUCAA for participants' travel in India and from Nepal, local transportation, and excursion to Ajanta and Ellora

\$19000 Total

REVIEW OF ISYA AT IUCAA IN INDIA, held January 1994  
A survey run January-June 1998 by D. Wentzel.

21 participants (out of 35) responded to the survey, including 16 foreigners and 5 Indians (of whom two were working outside India even at the time of ISYA).

7 have obtained an astronomy or astrophysics degree since ISYA, and are still doing astronomy, or they will soon obtain a degree;

2 already had a PhD and are now doing research in astronomy;

5 are working on a doctoral thesis in or related to astronomy (including at Harvard and Chalmers Univ. and using international collaborations);

2 are teaching astronomy;

3 work in physics; and

2 have left science.

(In addition, we also know of one participant who is now an astronomy post-doc and one who does astronomy research in Italy. We have been told that the three students from Pusan National University who shared one IAU travel grant have left astronomy.)

Two participants wrote explicitly that ISYA convinced them to stay in astronomy.

Two participants from outside India chose IUCAA (the site of ISYA) for the site of their post doc appointment.

One participant organizes an astronomy school for teenagers.

Thanks to the ISYA experience, one participant published an article "Astronomy in India" in Science.

One who left astronomy is now in commercial web technology. ISYA at IUCAA made him recognize the international importance of the web.

The value of the ISYA was most often expressed in terms of discussions which broadened participants outlook, not only on the scientific range of astronomy but on the nature of astronomers and on the international nature of astronomy.

Two participants valued the direct collaboration, after the ISYA, with ISYA faculty.

The general praise for IUCAA facilities (especially the library) was topped by two Turkish participants who expressed their shock at the high level of the library and computer system. (One is now on the technical committee for the Turkish National Observatory.) Use of the IUCAA library during ISYA was essential for the progress of the Ph. D. thesis of a third Turkish participant.

Responses regarding the lecture courses are remarkably diverse; nearly every faculty member was listed as most important by somebody. Michele Gerbaldi appeared most often.

The observations with the CCD were highly appreciated. The main suggestions for improvements concerned more observational and practical work, perhaps even a small individual project, less lectures.

## INTERNATIONAL SCHOOL FOR YOUNG ASTRONOMERS (ISYA)

JANUARY 3 - 21, 1994

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To IAU Secretariat

98 bis Blvd. Arago  
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From D. Wentzel

Jan. 10, 1994

1) Please write 8 checks for ISYA expenses.

I enclose a summary and an itemized accounting and check information for each.

2) Accounting enclosed for \$8000 cash for ISYA

I enclose a summary and an itemized accounting for each. I have checked all air tickets.

3) Accounting for ISYA expenses

cash \$ 8000

checks 8325

16325

\$ 2675 to be billed by IUCAA

Sincerely

Donald G. Wentzel  
Donald G. Wentzel  
Secretary for ISYA

# IAU ISYA India

checks to be paid

Caner Cicek \$ 1200 ✓

Hye kyeons Yi 1200 ✓ - (actual cost 1357)

Nayoung Kim 1200 ✓ - (actual cost 1357)

Ray Jayawardhana 1358 ✓

Ivan O'Brien 400 ✓ - (real cost about 900)

participants \$ 5358

Peter Eggleton 276 ✓

Don Wentzel 1171 ✓ - (real expense 1465)  
cash received 294)

Syuzo Irobe 1520 ✓

total checks 8325  
+ 8 ✓

8333

+ 24 charges (Jayawardhana)

8357

IAU ISYA - Indiq cash accounting

Received \$ 4000 from IAU direct  
4000 from IAU via M. Gerbald.

Le Thi Khang	1290
Do Thi Thien Huong	1285
Banu Melek	803
Tansel Ak	803
<del>Edouard Vorobiev</del>	<del>580</del>
Edouard Vorobiev	580
Oleg Verkho danov	580
Anna Andronova	580
Olga Tsiopa	705
Maria Madjarska	1080
	<hr/>
	7906
credited to Wentzel's costs	294
	<hr/>
	8000



**Inter-University Centre for Astronomy and Astrophysics**  
An Autonomous Institution of the University Grants Commission

**Statement of Expenses incurred for the organization of the XXth International School for Young Astronomers**

**January 3-21, 1994**

	<u>Amount in Rupees</u>
1. Pick up for Russian and Korean participants from Bombay to Pune	3,200.00
2. Travel for Indian participants	17,174.00
3. Meet and assist for Lecturers at Bombay(Wentzel & Gerbaldi)	1,520.00
4. Pune/Bombay/Pune tickets for Vietnamese participants	600.00
5. Transport for sight-seeing for participants	1,400.00
6. Transport for trip to Sinhagad fort	1,000.00
7. Transport for visit to GMRT site	2,400.00
8. Excursion to Aurangabad-Ajanta & Ellora caves	51,725.00
9. Transport within city-trips to Pune railway station for drops	1,000.00
<b><u>Total</u></b>	<b><u>80,019.00</u></b>

**Equivalent in US dollars 2550**