

# India

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## 1. Introduction

A summary of work related to astronomy education carried out during the last three years in India is presented here. Since India is a huge country and many educational efforts are made by individuals alone, this report cannot be regarded as complete, but a specific sampling.

## 2. General Information

India has more than 200 Universities, 8000 colleges, and about 100,000 schools, 33 planetaria, more than 100 museums and about 60 well known amateur astronomers' clubs. Scores of dedicated astronomy oriented school teachers, act as nuclei of astronomy education for the general public and school children. The astronomical almanac, used in a typical household is in some way related to the stars in the sky and the movements of the Sun, the Moon and the planets. Traditionally, a rudimentary knowledge of the celestial sphere is common. The recent developments in space technology have brought a fascination and glamour to modern astronomy for all age groups, and this is noticeably reflected in the number of media coverages of astronomy. There are about 12,000 telescopes of aperture no less than six inches, made by amateur astronomers.

## 3. Public Awareness

During the past three years there have been at least 300 six inch telescopes made by school children and laymen, under some project or other funded by the government and an equivalent number is also produced from private and individual resources. It takes about two weeks to grind and polish the mirror and assemble it in a suitable mount. After aluminizing the average cost comes out to be in the range US dollars 60–100, for a telescope of size greater than six inches. Small telescopes are acquired off the shelf and the recent eclipse fever has witnessed a sale of about 1000 telescopes by telescope making companies in the private sector.

Training schools in astronomy are also run by several planetaria, science centres and astronomy clubs. These are by and large successful. Some of them also result in a diploma after a rigorous one year course.

On a national scale a Confederation of Indian Amateur Astronomers (CIAA) has been formed in 1993 and registered in 1994, which organises the activities of amateur astronomers throughout the country for the society and the individual. Government of India has also formed a nationwide network of various schemes for science popularisation in which astronomy has played a major role. Such a network has produced more than 10,000 volunteers for educational activities with specific targets as the school children and laypersons who are usually parents of the children.

#### 4. Contribution of IUCAA

The Inter-University Center for Astronomy and Astrophysics (IUCAA) located in Pune has arranged a number of school, college and university programs in the field of astronomy education. Pune has a population of about three million, there are about 200 secondary schools, 40 colleges and 2 universities. We celebrate 28 February every year as the National Science Day. On this day about 100 schools participate in our quiz contest, astro-painting, essay competition and performance of astroballets and astrodramas. We also run summer school programs exclusively for school children of standard VIII, IX and X. Each child typically spends a week with an academic member of IUCAA working on a project. In this one week we introduce them to the basics of astronomy. Usually 70 schools participate every year with each school deputing 2 students as per prior arrangement. Also on the second Saturday of every month we arrange an educational popular lecture or lecture demonstration for school children. One such evening is attended by about 50 schools (each school deputes one science teacher and ten students). Every fourth Friday is reserved for evening sky observation or the star party as it is popularly referred to. Twice during the year the local science and geography teachers are invited for do-it-yourself type science experiments which also include the experiments based on astronomy as prescribed in the text books. About 75 schools join this programme very enthusiastically. Most of them have made a sky globe, low cost planetarium projector, sundial and small telescopes. These items are given away as an incentive to them. The college and university students (BSc/MSc/Mphil) are invited to do their final year project work in astronomy.

Vacation student programmes are arranged for pre-final year post-graduate students wherein they attend introductory review lectures on Astronomy and Astrophysics and carry out projects. At the end of the programme there is a test and an interview. The successful students are offered research scholarships for work in IUCAA after completing the M.Sc. courses in their universities. College and university teacher orientation programmes in astronomy are regularly arranged by IUCAA both on campus and in specific regions of the country. A syllabus is taught with the aim that these teachers can persuade their authorities to introduce a special paper in astronomy. By now 20 universities in India teach astronomy and astrophysics at post-graduate level and often allow complete project work in the field of astronomy.

#### 5. The Total Solar Eclipse 1995

A population of more than 30 million resided close to the path of the totality for the solar eclipse of October 24, 1995. This gave us a unique opportunity to introduce awareness for astronomy to a large population. Scores of seminars, lectures, demonstration, astrophotography, workshops, model making competitions were carried out on a large scale involving not less than three million children. About one million eclipse goggles were sold. Two amateur clubs made sixteen inch telescopes for themselves and took professional type photographs of the eclipse. One amateur club has photographically recorded the shadow bands. Incidentally the same club publishes the sky watchers guide every month at a nominal cost of 0.15 dollar and makes it available to the subscriber before the month begins. Although the articles are not as professionally written, the quality of information is comparable to that of any international magazine.

## **6. Books**

A preliminary survey of astronomy related books in the Indian market suggests that there are about two hundred popular books in astronomy in major languages of the country.

## **7. Conclusion**

In conclusion it may be said that general awareness for astronomy education as a part of science education in the country has been steadily growing both through individual efforts and through government aided institutions as well as non-governmental organizations.