

Astronomical observatories for schools, school systems and colleges

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1. Introduction

In ancient times, whereas India was an advanced country economically as well as educationally, its leadership in the field of astronomy was most remarkable. Today, not only are we a developing country, we lag behind others in the field of astronomy far more than in any other field of learning. That is why the National Policy on Education 1986, has put space science as one of the thrust areas in education. And school is the foundation-stone of all education. Thus there is an urgent need that the students in schools learn the astronomy related principles and concepts well (which are also included in the curriculum) and also take interest in co-curricular activities in this field.

As far back as in 1965, Department of Science Education (now DESM), NCERT acquired five 6"-reflectors (Newtonian telescopes) and five 80mm-refractors and planned to make a beginning by establishing model observatories aimed at schools and school systems in Delhi, Bhopal, Bhubaneshwar, Mysore and Ajmer. In spite of all the seriousness on the part of the then Head of the Department of Science Education, Dr R. N. Rai for this work, somehow this programme could not take off. The need for establishing such observatories which function well has become all the more vital now in 1990's. Schools where these observatories are situated can function as centres of excellence in space science education. These observatories may act as resource centres for students of neighbouring schools or of other schools in a school system. Some of these observatories could also undertake programmes of training teachers.

2. Objectives

The objectives of these school observatories can be summarised as under :

1. To create an awareness about events in space and an understanding of how these events follow the same principles of science which the events on earth follow.
2. To promote better teaching of space science component of science curriculum (and entire curriculum in general) in the schools.
3. To promote observation of events in space and study of celestial objects as a co-curricular activity.
4. To promote production of good teaching aids and their use in the teaching process for space science component of science curriculum in particular and for entire science curriculum in general.

Why centres of excellence for Astronomy related co-curricular activities in schools and colleges

Now-a-days, the trend in science education is integration. We have integrated Science up to Class X. For co-curricular activities many schools and colleges have science clubs where interested students engage themselves in scientific hobbies, whether one's hobby is closer to Physics, or Chemistry, or Biology. There are some specialist clubs too e.g. photography club or electronics club, but in many institutions these activities too are organised under the umbrella of science club only.

An expert in science education may make a simple argument that Astronomy related activities can be done in science club itself. In the science curriculum, too, Astronomy related topics form a small component. For this purpose, a small astronomical telescope can form part of the physics laboratory equipments. It is not so costly and even every school can have it. The intention in this argument is a 63mm telescope on altazimuth mount without circles. In the training of teachers also the astronomy related concepts will better form a component of the orientation course for the full curriculum. A special 'training in the Astronomy for Schools' may sound like making it a separate elite subject, which is not desirable.

The basic fact to understand here is that these arguments are highly insufficient. Vast majority of science teachers are ill-equipped even to handle the astronomy related concepts included in the curriculum. Same is true to their capacity to handle the smallest astronomical telescope. The result is that it is the most neglected component of curriculum and the telescope, if the school has one, just keeps lying in a locked almirah. The fact that if a concrete observation of celestial objects is to be done by the telescope, it can't be within school hours (except observations on Sun) strikes the final death blow on these activities. The chance that sky may be overcast on the particular evening when a teacher plans to show celestial objects to his/her students is another difficulty to be overcome.

Author's experience with teachers in various orientation courses show that about 25% of Physics teachers certainly take genuine interest in the study of the celestial objects. But it is essential that we make a plan which works. and in making such a plan the role of school observatories discussed above becomes central.

The efforts at Mann Public School, Delhi

It is a residential public school on the outskirts of Delhi. A 6"-reflector on equatorial mount with motor drive has been acquired. Efforts are being made to develop A.V-material in collaboration with Science Centre No. 2, Delhi Administration and one slide set on 'Evolution of Stars' is already at a fairly advanced stage. A design for a nanogon observatory based on iron pipes or angle irons has been developed, which is expected to be quite sturdy. However, to further reduce its weight, a fibre glass observatory kit with seven wheels is under development.

References

- Ved Ratna, A Portable Nanogon Rotating Hut for Observational Astronomy Activities in Schools and Colleges, School Science, a journal of the NCERT, (submitted).