

## Education through communication

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### Abstract

Children have always been the best distributors of information. They impart what they learn in school to family, friends and to other children. That is why astronomy communication should begin at their level, for children, at school.

IAU Commission 46 is undergoing a period of major transformation, seeking new ways to educate, motivated by the appearance of new technology and the attention given to it by children, and also to the internet, TV, films, DVD, etc. The special events celebrated by the entire world – International Heliophysical Year (IHY) and the International Year of Astronomy (IYA2009), to which Romania added the centenary of Romanian astronomy in 2008 – help us to attract people, and particularly children to astronomy and to science. So, in this presentation, we will approach the ways in which communication can help education, and how this may lead to an increase in the level of education in civilised societies today.

The International Year of Astronomy IYA2009 is close, and is preceded by the National Year of Astronomy 2008 in Romania, when we will celebrate the centenaries of the Observatory in Bucharest and of that at Dubasari, now in the Republic of Moldavia. These are sufficient reasons why astronomy education should find new ways of expression, and of disseminating astronomy education at the level of the general public and at that of children, teenagers and young people in particular. We must also take this opportunity to present the role of astronomy education in a nation's development to the authorities.

Furthermore, the IAU Commission 46 *Astronomy Education and Development* is currently trying to implement programmes for developing countries, members or future members of IAU, as illustrated by one of its founding statements: *it seeks to further the development and improvement of Astronomy education at all levels throughout the world through various projects initiated, maintained, and to be developed by the Commission and by disseminating information concerning Astronomy education at all levels.*

There have been other efforts to this effect for some time. It is worth mentioning the *IAU Resolution on the Value of Astronomy Education*, approved at the XXV General Assembly in Sydney in 2003, which recommends that:

- Educational systems include astronomy as an integral part of the school curriculum at both the elementary (primary) and secondary level, either on its own or as part of another science course.

- Educational systems and national teachers' unions assist elementary and secondary school teachers to obtain better access to existing and future training resources in astronomy in order to enhance effective teaching and learning in the natural sciences.
- The National Representatives in the IAU and in Commission 46 call the attention of their national educational systems to the resources provided by and in astronomy.
- Members of the Union and all other astronomers contribute to the training of a new, scientifically literate generation by assisting local educators at all levels in conveying the excitement of astronomy and of science in general.

To fulfil its goals, the Commission collaborates with many international bodies, including other IAU commissions.

Various methods of collaboration have been used:

### **Classical, theoretical and practical methods**

Classical methods concern traditional lessons held in schools, which combine lectures with discussions involving the pupils, checking the knowledge gained during earlier classes by means of questions or tests and practical, observational or computer lessons.

### **Textbooks**

Astronomy textbooks have been edited for various audiences: for groups of pupils taking classes in both general and specialised education programmes, for schools both with normal and special training programmes (for both gifted children and disabled ones), for students who want to improve their astronomy knowledge to complete their personal study programmes (in physics, biology, etc.), and who have not yet had an astronomical training.

### **Special schools**

Recently, special astronomy schools have been organised across the globe, the best known example being that of the International Schools for Young Astronomers – ISYA. The 2007 School was held in Malaysia, and that of 2008 (the 30<sup>th</sup>) will take place in Turkey. The Schools are intended primarily for graduate or PhD students who want to find out more about astronomy or who want to find a field in which to concentrate and study astronomy more deeply. An ISYA took place in Romania in 1999 to give students the opportunity to observe and discuss the total solar eclipse of 11 August, whose maximum was on Romania's territory.

### **Astronomy Olympiads**

Astronomy Olympiads are an excellent opportunity to stimulate the improvement of astronomy knowledge at various school ages. Between 29 September and 7 October 2007 the Euro-Asian Astronomical Society organised the 12<sup>th</sup> International Astronomy Olympiad in Simeiz, Crimea. The Promotion of Academic Olympiad and Development of Science Education Foundation (POSN) is organising the 1<sup>st</sup> International Olympiad on Astronomy and Astrophysics between 30 November and 9 December 2007 in Thailand.

Naturally, more competitions at the regional level would allow more children than ever to participate as travel expenses would be significantly lower.

### Special astronomical events

Any astronomical event, from regular meteorite showers to spectacular total solar eclipses or rare events such as the transit of Venus, in 2004, is an opportunity to attract children to astronomy. Children are one of the main vehicles for the spread of scientific information, because they can disseminate what they find out about the Universe to their circles of friends or families, thus avoiding, for instance, the creation of panic in social groups not warned in time about a total solar eclipse.

However such events require long and special preparations, at both national and international levels. In 1994 I remember writing that *“there are only five years left until the eclipse”*. From scientific preparation proper to teaching children about the importance of the event, promoting effective and secure means to observe the eclipse, the prevention of panic and persuading the authorities to support astronomy and the education of the general public was a long road, strewn with many obstacles, but bringing great satisfaction in the end. The eclipse day turned from a scientific into a media event, due to the presence of our country’s president and of the NASA general manager, as well as of an impressive number of government members and diplomats, all of whom attracted reporters from all over the world. Thus the public found out not only about the event, but about the place where it was taking place.

### Special events connected with celebrations

The three successive years, 2007, 2008 and 2009, are being dedicated to special astronomical events in Romania.

**2007:** This is the International Heliophysical Year — IHY, when we celebrate the 50<sup>th</sup> anniversary of space exploration and the tenth anniversary of the Cassini-Huygens launch<sup>1</sup>. Europlanet’s Outreach network has named this year *A very “Spatial” Year*<sup>2</sup>, and has proposed a range of events during the first two weeks of October 2007. This is an opportunity to meet our celestial neighbours, due to the very favourable conditions for observing Venus, Mars, Jupiter, and Saturn. Various theatrical shows related to the planets and their exploration are scheduled in Europe. A very attractive way to discover the Solar System is through food, by means of a programme named *Astronomy/Gastronomy*.

Last but not least we should mention the three categories of the Europlanet Competition, namely:

- For amateur astronomers, the most beautiful picture of an object (or objects) of the Solar System, taken during 2007;
- For children from 6 to 12 years old, the most beautiful drawing of object (or objects) of the Solar System, made during 2007;
- For artists, the best artistic tribute to the Solar System (in the form of a video clip, drawing, painting, sculpture, and so on).

The site has been translated in very many languages, thus facilitating the access of a great number of participants from Europe.

<sup>1</sup> <http://ihy2007.org/igy.shtml>

<sup>2</sup> [http://www.europlanet-eu.org/index.php?option=com\\_content&task=section&id=11&Itemid=37](http://www.europlanet-eu.org/index.php?option=com_content&task=section&id=11&Itemid=37)

**2008:** This is the national year of Romanian astronomy. Between 2007 and 2009 Romania will celebrate 100 years since the Observatory in Bucharest, the main Romanian astronomical research institution, and Donici's private Observatory, now in the Republic of Moldavia were established. Preparations for this event are coordinated with efforts to have astronomy education reintroduced into the school curriculum.

**2009:** This is the most important of the three years mentioned, when the celebration of the 400<sup>th</sup> anniversary of the first use of an astronomical telescope by Galileo Galilei offers a great opportunity for a large astronomy education campaign at all levels, from children to the politicians responsible for the future of our planet. The IAU Commission 46 has not yet set a special programme, as all its goals should lead to the implementation of astronomy from the earliest ages to the use of any opportunity to attain the IYA2009 objective *to help the citizens of the world rediscover their place in the Universe through the day- and night-time sky, and thereby engage a personal sense of wonder and discovery. All humans should realize the impact of astronomy and basic sciences on our daily lives, and understand better how scientific knowledge can contribute to a more equitable and peaceful society.*

What can be considered utterly new is the ever more frequent use of new means of communication. In particular, those related to the mass media can be readily applied to astronomy education and are more efficient than we could have hoped several years ago.

The general public and young people in particular are increasingly attracted by TV channels broadcasting scientific information, producing documentaries portraying the Universe as an endless source of information. Scientific journals, although maybe less in demand than popular magazines (due not least to the international languages in which they are written), and even the journals of some societies, clubs, etc. give handy material to anybody who wants to learn about a certain topic and keep it to hand.

Maybe here we should also mention posters which, although less rich in information, still have an important educational role to play and additionally give one the pleasure of decorating one's room with the latest space missions or with images from "the new" Solar System.

More attention should be paid to what is presented on the internet. I have personally found so many errors while looking for something connected with astronomy, and, last but not least, so many confusions between astronomy and astrology that I believe that the way in which children especially learn about the sky from the computer screen should be treated more carefully. It should also be mentioned that we have to take steps so that children can learn about the sky directly, away from city lights and not only from monitors or screens. To this effect there should be a greater collaboration between:

- Mass media;
- Schools;
- Amateur groups;
- Planetariums;

- Museums;
- Scientists;
- National and international associations.

Finally, there should be a closer collaboration even within the International Astronomical Union, between Commission 46 *Astronomy Education and Development* and Commission 55 *Communicating Astronomy with the Public* in particular, which might lead to the identification of new means of astronomy education throughout the world and in the developing countries in particular.