Abstract

A scientist must not only do science, but must also know how to communicate it. It is possible that he or she even ends up becoming devoted professionally either to outreach or to teaching. Therefore, the Master’s Degree Course in Astrophysics¹, created by the University of La Laguna (ULL) with the collaboration of the Instituto de Astrofísica de Canarias (IAC), includes in its programme the four-month core course unit Communicating Astronomy: Professional Results and Educational Practice (in Spanish, Comunicación de Resultados Científicos y Didáctica de la Astronomía), that is worth three ECTs. In this poster, I present the results of our experience from the academic year 2006-2007, in which seventeen Master’s students, in addition to learning the skills necessary to communicating their results within the scientific community, have also studied the language of popularisation in a practical and fun way through role-playing as science writers and schoolteachers in the classroom.

Profile of the lecturers

The course unit is distributed between three lecturers, each responsible for different aspects of the subject matter:

John E. Beckman: astrophysicist. Research Professor at CSIC and researcher at the IAC. He is responsible for dealing with communication in the scientific context: articles and research projects, research-workers’ CVs and preparing scientific posters.

Inés Rodríguez Hidalgo: Astrophysicist. Lecturer at the ULL, researcher at the IAC, current Director of the Museo de la Ciencia y el Cosmos and science communicator. She is responsible for the part dealing with oral communication and for practicals at the museum.

Carmen del Puerto Varela: Journalist specialising in science and technology. She has a PhD in Information Science and is Editor-in-Chief of the IAC Press Room. She is responsible for the part dealing with the social communication of astrophysics in its journalistic and didactic aspects.

The course is given with the collaboration of Terry Mahoney, a researcher at the IAC, and the Museo de la Ciencia y el Cosmos of the local government of Tenerife.

¹ http://www.iac.es/ensenanza/master/
Aims and objectives of the course unit
The course covers the social communication of astrophysics in its journalistic and didactic aspects:

- To awaken a strong interest in the future astronomer in popular science communication, the final and necessary phase of the scientific process.
- To combat the prejudice that only failed scientists do outreach and that science popularisation damages research and is a needless distraction to the researcher.
- To acquire the tools necessary to make scientific results known to the mass media, while attending to the respective requirements of each medium (press, radio, TV etc.).
- To examine the working methods specific to journalism, and to identify how these differ from those of scientific research.
- To become familiar with the language of popular scientific communication and to improve, through practical exercises, levels of written and oral expression.
- To be familiar with current didactic projects and to design educational strategies in the field of astronomy.
- To make students aware of possible job opportunities in the areas of outreach and teaching.

Methodology and evaluation
The classes are primarily practical, although a theoretical basis is provided for the students. There is no examination, attendance at lectures is obligatory, and students must complete the practicals and demonstrate an active participation in the class to pass the course unit. A premium is set on clarity of exposition, sound argumentation and the correct form of expression, befitting the orthographic and grammatical rules of the language (Spanish).

Debates
We started by debating the scientific news of summer 2006 — the demotion of Pluto from planetary status — dwelling on the fact that virtually no actual research work presented at the General Assembly of the International Astronomical Union in Prague had filtered through to the mass media. We also spoke of the “very bad press” that journalists tend to receive among scientists. The students were urged to free themselves from this particular prejudice. It is not the function of journalism that should be called into question, but the professionalism of the journalists. It is impossible to imagine a world without mass media. We concluded that it was necessary to reconcile both groups — scientists and journalists — and that there could be different levels of scientific communication, each legitimate in its own way.

Comments on the language of science communication
The students read a number of articles and were asked to comment in writing on two of them in particular, one dealing with the expanding balloon/raisin cake analogy to the expanding Universe, and the other covering topics from the cometary collision on Jupiter to the spherical collapse of the Universe (a look at the challenges of outreach in a scientific institution such as the IAC).
Scientific news

It was necessary to invent a piece of news and to write it up within journalistic parameters. The story could be related to science fiction or a classic discovery, but had to be turned into a news item with headlines appropriate to the 21st century. The following examples were set: “Not so far away: a new device sounds the celestial depths”. “Why do apples fall? Isaac Newton publishes a theory of ‘gravitation’ in his book *Mathematical Principles of Natural Philosophy*”, and “Spanish scientist finally discovers the origin of mass. Fernando Buitrago (Master’s student) finds the Higgs boson with the European Particle Accelerator”.

The supersymposium

It wasn’t carnival time, but Archimedes appeared in class, with his Greek outfit and his lines learnt by heart. A student had chosen this notable scientist of antiquity for one of the practical classes. Each student reincarnated different historical scientists and had to submit himself to the questions of his partners, who played the role of journalists for one day. For this role-playing practical, marks were awarded for effort in sharing discoveries with society. Accompanying Archimedes, were Aristarchus of Samos, Ptolemy, Giordano Bruno, Christiaan Huygens, Edmund Halley, William Herschel, John Goodricke, Joseph Fourier, Lord Kelvin, Giovanni Schiaparelli, Edwin Hubble, Charles Townes, Andrei Sakharov, Stephen Hawking and Jocelyn Bell-Burnell. At the end of the performance, one of the students impersonated the South Korean scientist, Woo Suk Hwang, protagonist of one of the most scandalous scientific frauds in history involving the false cloning of human embryos. It was an entertaining way in which to assess critically the peer-review procedures of the journals in which scientists publish their research.

The didactic unit

As part of their deliverable input to the course, the students had to prepare a didactic unit on a theme or a specific aspect relating to astronomy or physics that had been covered in the mass media during the term. This homework involved pursuing a news story that had been published in the press and eliciting its potential utility in the classroom at a specified educational level. An example of the use of press coverage in the classroom, the handling of the Pluto debate by the astronomical portal COSMOEDUCA was given to the students. Organisation, fitting the facts to the story, written expression and, above all, originality and effort in communicating were valued. This project was part of the final evaluation of the student. The best contributions were included in the portal. A student made use of press clippings of a discovery concerning rubidium stars made at the IAC to prepare a didactic unit on stellar evolution. Another student proposed teaching scientific concepts with help of comics and superhero movies. Further topics included the Theory of the Special Relativity, black holes, star clusters, Mars and space missions, the Sun, the Hubble Space Telescope, meteor showers and meteorites, exotic meteorology in the Solar System, and the life beyond the Earth.
Putting it all into practice

Some students volunteered to help in the journalistic coverage of two meetings organised by the IAC in September, 2007: the 30th Spanish Relativity Meeting, in Tenerife, and the HELAS NA3-2 of Helio- and Astroseismology workshop, in La Palma.

English: translation Terry Mahoney (IAC)