Jean-Pierre Luminet: Renaissance Communicator

Interview

Lee Pullen
International Astronomical Union
International Year of Astronomy 2009
ESO ePOD
E-mail: lpullen@eso.org

Pedro Russo
International Astronomical Union
International Year of Astronomy 2009
ESO ePOD
E-mail: prusso@eso.org

Key Words

Interview
Communication
Methods

Summary

Science communication, like other areas of study, features prominent figures who lead the field. One such individual is Jean-Pierre Luminet, a researcher, communicator, artist and author. As recipient of the 2007 European Science Communication Prize for Communicator of the Year, Jean-Pierre is at the forefront of his field. The *CAPjournal* editorial team interviewed Jean-Pierre to discover more about the man, his mission and his methods.

Figure 1. Jean-Pierre Luminet.

How did you begin your career in science? When did the interest in science/astronomy develop?

I was born in the south of France in 1951. My parents were teachers at the local college and had no special interest in science. When I was a schoolboy I was interested by many things, especially music, painting, literature, poetry. I also liked mathematics because it seemed easy to me, so I followed the usual path in the French education system: a scientific degree. In the 1970s I went to Marseille University for my graduate studies in mathematics, without knowing yet whether I would like to become a writer, a musician or a scientist later. Then I read by chance an excellent book popularising cosmology, and I realised that fundamental research could be as creative and imaginative as art or literature. I decided to have a career in science. I had the chance to meet Brandon Carter, a world-renowned specialist in the study of black holes, who became my PhD advisor in a small research group studying relativity at the Paris-Meudon Observatory. My first contact with top-level research was in 1976, when I spent a few months at the famous Department of Applied Mathematics and Theoretical Physics (DAMTP) in Cambridge, UK, where I met Stephen Hawking, S. Chandrasekhar, Roger Penrose, George Ellis and others. Back in Meudon I was awarded my PhD in 1977 at the University of Paris on a very theoretical subject (singularities in spatially homothetic cosmologies). Next, I worked on black hole astrophysics. In 1979 I published the first computer generated image of a black hole accretion disc, which quickly became a classic, and I took up a permanent position at CNRS. I received a Doctorat d'Etat-ès-Sciences in 1985, after studying the tidal disruption of stars by black holes.

Figure 2. Two of Luminet's book covers. Credit: Jean-Pierre Luminet.

What is it about astrophysics and cosmology that you find particularly fascinating?

When I first began to wonder about nature, and more specifically about the size, the origin, the fate of the Universe and of its contents, I did not know that these were some of the questions that humanity has asked itself since antiquity. In nearly every culture, philosophers, scholars or artists have supplied various explanations, which have evolved over the course of history. What is particularly fascinating with modern astrophysics and cosmology is that these disciplines try to respond to these questions by combining mathematical reasoning, physical models and astronomical observations. And they do it rather successfully, with Big Bang models, black holes, high energy physics and so on!

How did it feel to win the 2007 European Science Communication Prize for Communicator of the Year?

It goes without saying that it was a great honour to receive such a prize. But for me it had a special added value for the following reasons. The challenge of science communication is to make very abstract and difficult concepts understandable to a general audience and to young people. I always keep in mind a remark by Erwin Schrödinger, one the fathers of quantum mechanics who devised the famous, but very abstract Schrödinger equation, when he wrote, *"A theoretical science unaware that those of its constructs considered relevant and momentous are destined eventually to be framed in concepts and words that have a grip on the educated community and become part and parcel of the general world picture — a theoretical science, I say, where this is forgotten, and where the initiated continue musing to each other in terms that are, at best, understood by a close group of fellow travellers, will necessarily be cut off from the rest of cultural mankind; in the long run it is bound to atrophy and ossify."* Thus I tried to communicate my own fascination for the hardest concepts of science to the general public and the younger generation via a variety of media such as books, television, exhibitions, music or the plastic arts.

But there is a price to pay. It is not at all easy to pursue so many activities simultaneously in the field of science, communication, public conferences, writing, art, etc., because a large part of the academic community (at least in France) is not very indulgent to or understanding of those who try to explore several ways. To be honest, in recent years I have sometimes felt a bit of inertia or been discouraged, because, in the eyes of many colleagues, my popular science activities tended to mask the value of my pure research work (well recognised abroad). But thanks to the award received from Europe, I feel more confident in quietly continuing my mission for scientific and cultural outreach, although the perception of my work in the French specialised community has not improved since then!

What is the secret of writing successful science communication books?

The description of science began in Greek antiquity. Then natural philosophers such as Democritus, Heraclitus and Plato were both scholars and masters of language. In their studies of nature, physical reasoning and poetic expression went hand-in-hand. Throughout history, this manner of communicating science has seen some success, as well as some virulent criticism. Some "purist" thinkers have proposed that no literary expression can give a proper account of the subtleness and complexity of scientific thought. As for me, I have always thought that there is no contradiction between the scientist's work and the writer's art (although I am perfectly aware of the limits of language, of analogies and metaphors). For instance, I have always tried to apply the idea that the very form of a book can reflect, in one way or another, its content — through its size, its layout, its organisation, its literary construction, and its rhythm. Thus for me, the ideal "recipe" for successful science communication books (not necessarily leading to a short-lived best-seller!) lies in a mixture of enthusiastic passion, a rigorous and always up-to-date scientific content, and a high level of literary achievement.

How can art help with the communication of science?

For me, as for Omar Khayyam, who was an astronomer, a mathematician and a poet in the Persia of the 11th century, science is not the only road to knowledge. I have always believed in the links between the various forms of human creation, and I am deeply convinced that different approaches — whether scientific, artistic, philosophical or others — give rise to different perceptions of the world, but with an underlying common imaginary element. In that sense, art, and more generally an aesthetic approach, can really sustain and help science communication.

Do you use any models for communicating science with the public?

As long ago as the third century BCE, in Syracuse, in the Greek colony in Sicily, King Hiero called on Archimedes to turn his art from purely intellectual issues to concrete objects, to render his reasoning accessible to the senses and tangible to the common man. A high point in science communication was reached by Lucretius. This Latin poet of the first century BCE, a follower of Epicurus and the atomistic philosophy, left a crucial work, *On the Nature of the Universe (De natura rerum)*, which admirably combined an epistemological design with a concern for form. Lucretius constructed his work as a poem whose rhythm and structure fits its content as closely as possible.

Now this is for books. Since I also use other media such as documentaries, exhibitions, audio records, artistic works, novels, etc., each medium has its own specificities,

and frankly I have no model other than my passion to make complicated things understandable.

Which aspects of communicating astronomy with the public do you find particularly challenging?

Most of the concepts and results of modern astrophysics and cosmology are in contradiction with what is called "common sense". For instance, the idea (developed by such bright minds as the philosopher Immanuel Kant) that finiteness implies limits. Such an argument is faulty, because it relies on propositions coming from supposed common sense (or mathematical ignorance). Another example is the common belief, shared not only by laymen, but also by most professional cosmologists, that the real Universe is necessarily greater than the observed one. To believe the inverse (and this is quite possible in the framework of "wraparound" universe models that I have developed and worked on a great deal) clearly goes in opposition to common sense. But this is not sufficient for the idea to be dismissed — quite the contrary, as the history of science has often shown! Common sense, whatever it may be, cannot help but be surprised by science on occasion. It is, after all, only an argument of authority for those ideas shared by the greatest number. This is, for me, the greatest challenge for communicating scientific knowledge. As Galileo said, the number of people who reason well in complicated matters is much smaller than those who reason badly! Other challenges are important and simpler to explain: help stimulating interest in science, promote the understanding of scientific progress and its implications in wider society, boost scientific culture, and encourage young people to take on scientific careers.

How do you visualise the future of European science communication, given the difficulties presented by language and cultural barriers?

I am profoundly attached to the idea of the prominent role of Europe in the field of knowledge, both in the past, of course, but also in the present and the future. As a consequence I have always highlighted in my work for the public the intimate presence of European discoveries in the remote and recent past. For instance, the purpose of one of my popular essays in the history of science has been the re-evaluation and promotion, based on extensive historical and scientific research, of the Belgian priest and cosmologist George Lemaître. Lemaître pioneered the application of Einstein's general theory of relativity to cosmology, suggested a precursor of the law now named after the American Edwin Hubble, and proposed the first "Big Bang" theory. Also, in my series of scientific biographies of European scholars (Copernicus, Tycho Brahe, Kepler, Galileo, etc.), I tried to give a clear and historical vision of the fundamental contribution of European scientists to astronomy and our understanding of the Universe over some 25 centuries. In this manner I want to illuminate the richness of European culture and the clear place of science within it. Of course there is the barrier of language and culture. But translations are possible, and my main satisfaction in this field is to see the number of translations of my works into English, German, Italian, Spanish, Portuguese, Greek, Dutch, Polish or Czech.

Biographies

Jean-Pierre Luminet is an astrophysicist at the Paris-Meudon Observatory in France and a leading expert on black holes, cosmology and the new field of cosmic topology – the study of the overall shape of the Universe. He has published numerous articles in the most prestigious journals and reviews in these areas. He has been awarded many prizes for his work in pure science and in science communication. His website address is: http://luth2.obspm.fr/~luminet/.

Lee Pullen puts his astronomy degree and science communication master's to good use, engaging a wide range of hard-to-reach audiences. He specialises in science education and journalism, having taught several thousand people about the cosmos and regularly writing for NASA's astrobiology web magazine. His enthusiasm is legend, as is his website: www.leepullen.co.uk.

Pedro Russo is the IAU Coordinator for IYA2009. He is a member of the Venus Monitoring Camera/Venus Express Scientific Team and has been working with Europlanet, IAU Commission 55: Communicating Astronomy with the Public, EGU Earth and Space Science Informatics Division and the IAF Science and Society Committee.