

Out of the darkness: tweeting from space



Image courtesy of ESA / ATG medialab

The Rosetta mission's comet landing leads to amazing and unexpected destinations in the field of science communication.

By **Julia Roberti**

It was one of those rare moments that made headlines worldwide, summed up in 140 characters:

Philae Lander @Philae2014 Nov 12
Touchdown! My new address: 67P!
[#CometLanding](#)

The fingers hurriedly tapping on the keys, and tweeting the message in 10 languages, are those of Karin Ranero. Previously an intern with *Science in School*, Karin is now an editor for the German Aerospace Center (DLR) web portal and *DLR Magazine*. She was also part of the

team tasked with running the Twitter account for one of the global stars of 2014 – not a footballer, an actor or a singer, but a tiny robotic probe named Philae, which went where nobody and nothing had gone before: the surface of a comet.

In November 2014, people around the world held their breath as a live web stream showed the pinnacle of the European Space Agency (ESA)^{w1} Rosetta mission^{w2} as it carried the Philae lander to its final destination – Comet 67P – after a 10-year journey across the Solar System. Five hundred million kilometres away from Earth, the orbiter and lander communicated with each other and with researchers here on Earth. But



- ✓ Physics
- ✓ Careers
- ✓ Space
- ✓ Ages <11–19

This article describes how one young scientist covered the landing of the Philae probe via the social media platform Twitter. It could be used to encourage students to consider careers in science, demonstrating that science careers do not necessarily involve working in a laboratory. It could also be used as an introduction to space and discovery, arousing students' interest in something they have seen on the news.

The article could form the basis of a discussion about the technology and careers that are involved in the project. For example, the students could discuss the photography, forces, how the lander got to the comet, the landing, solar energy, the computer systems to run the project, the engineering involved, rocket science, the science of comets and how the communication systems work. It could also provide a stimulus for a project on space and astronomy.

Mike Sands, Longcroft School, UK

REVIEW

Image courtesy of ESA / ATG medialab

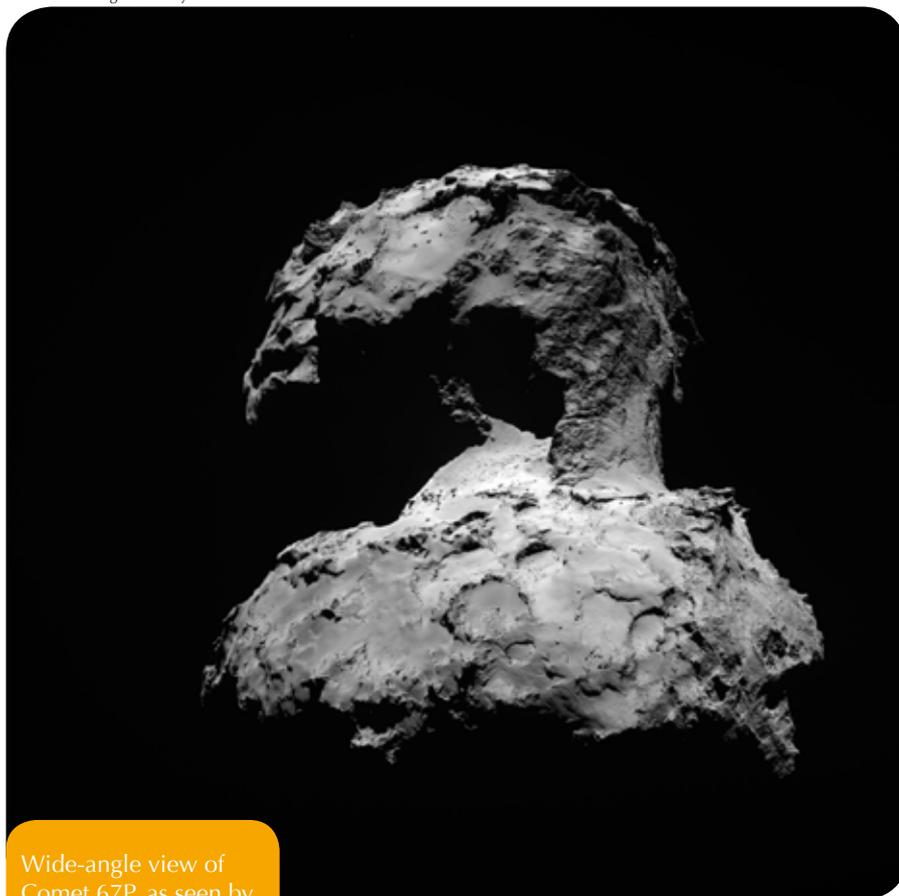


The Philae lander

unlike during the first Moon landing, many people followed Philae's adventure via a very modern channel: Twitter.

Karin is one of the people in the team that gives Philae its voice and soul. "My job combines a bit of everything I have learned," explains Karin, who was an intern at the European Southern Observatory (ESO)^{w3} before moving to *Science in School*, which is based at the European Molecular Biology Laboratory^{w4}. "I studied astrophysics, but I realised that communicating science was what I enjoyed the most. I wanted to learn how to better connect with people, so I also pursued further studies in psychology. After

Image courtesy of ESA



Wide-angle view of Comet 67P, as seen by Philae on 12 September 2014

The orbit of Comet 67P. The 6.5-year journey around the Sun takes it from just beyond the orbit of Jupiter at its most distant, to between the orbits of Earth and Mars at its closest.

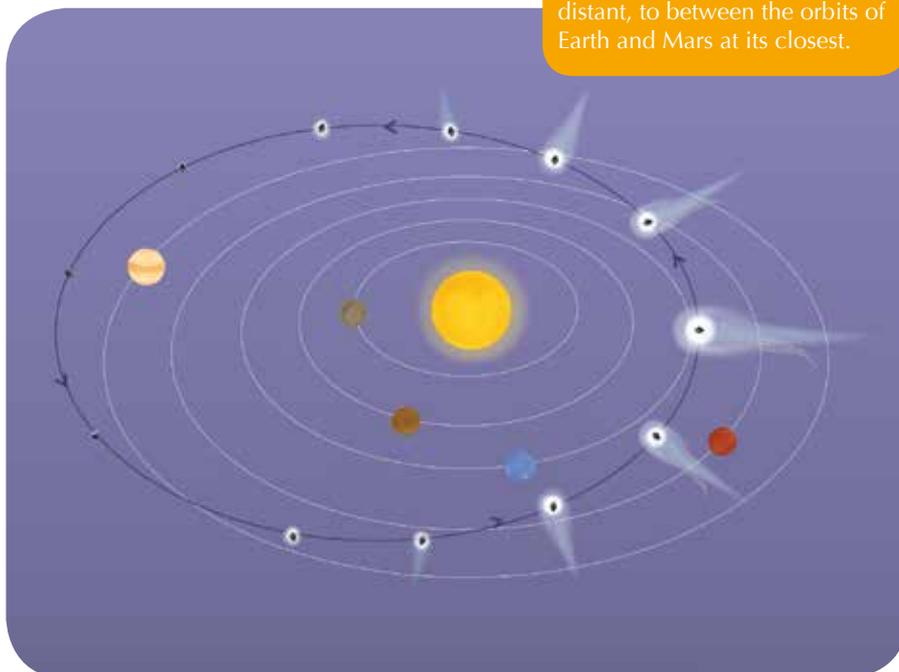


Image courtesy of ESA

completing my bachelor degrees, I worked in the communications department of the Teide Observatory (*Instituto de Astrofísica de Canarias*) where, among other things, I was responsible for its contribution to the Liverpool Telescope's National Schools' Observatory project. During my time there, I also worked closely with museums, which is why I then decided to pursue a master's degree in museum studies." All of this experience is being put to good use in Karin's current job. "If you explain something and people can relate to it, that draws their attention and makes them want to know more – with Philae, it helped that we were able to tell this story in a fun way."

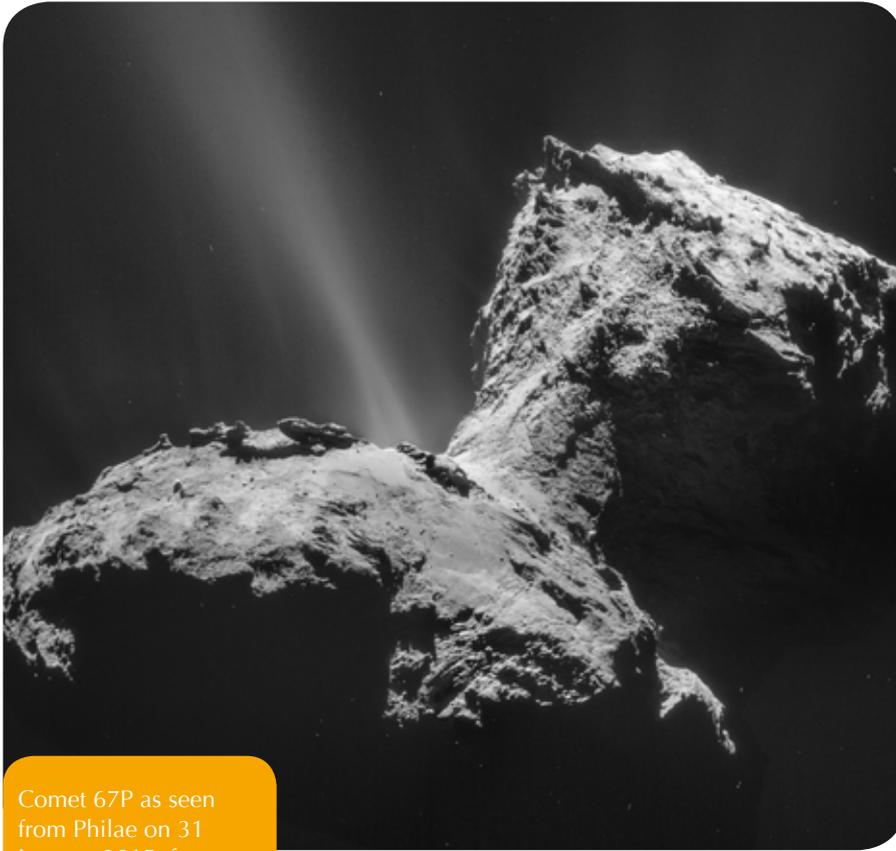
And that is exactly why @Philae2014 exploded on Twitter, reaching 400 000 followers, gathering retweets from the US White House and feeding headline stories around the world.

Philae Lander @Philae2014 Nov 12
Finally! I'm stretching my legs after more than 10 years. Landing gear deployed!
[#CometLanding](#)

The story was enriched by interactions with the Rosetta spacecraft's own Twitter account, run by a team at ESA. Karin explains that tweets between Philae and Rosetta resemble a conversation between friends on a great adventure – not pieces of metal in cold outer space, but beings full of emotion. "We had a great time working with the Rosetta team and the scientists at the DLR Lander Control Centre. We tried to think of conversations beforehand, but they could change in a minute."

Philae Lander @Philae2014 Nov 12
I'm on the surface but my harpoons did not fire. My team is hard at work now trying to determine why.
[#CometLanding](#)

Image courtesy of ESA



Comet 67P as seen from Philae on 31 January 2015, from a distance of 28 km

Image courtesy of ESA



View of Comet 67P as seen from Philae on 14 February 2015, from a distance of 8.7 km

Indeed, being Philae gives Karin a direct line to DLR's Lander Control Centre. "In such moments of tension, it is important to wait for advice from the experts who first have to figure out what is happening," she says. When Philae's harpoon system failed to anchor the lander on the comet, for example, Philae bounced and landed in a rugged region a few kilometres away from its target, something Karin points out was good luck disguised as bad luck. Philae imaged structures and examined an area that might never otherwise have been seen.

Philae Lander @Philae2014 Nov 12
 My #lifeonacomet has just begun @ESA_Rosetta. I'll tell you more about my new home, comet #67P soon... zzzzz
[#CometLanding](#)

Before exhausting its batteries, Philae sent plenty of data to keep researchers here on Earth busy – and there could even be another twist in the tale. "Philae's landing site will protect it from excessive radiation," Karin adds. "Scientists are hopeful that when Comet 67P gets closer to the Sun, Philae will have enough energy to wake up – and we will be waiting for it. I will never forget the atmosphere in the Lander Control Centre during the landing. It was a spectacular, once-in-a-lifetime event that will be written about in history books, and it was a privilege to be part of it." And thanks to Karin and her team, thousands of people feel the same way. Mission accomplished.

The Teide Observatory, where Karin worked earlier in her career



Physics

General science

Image courtesy of Niels Holtenberg; Image source: Wikimedia Commons



Brief interview with Karin

How did you first become interested in science? Was there a particularly important moment or person or did your interest grow gradually?

I think I became interested in science because my father is an engineer; he always encouraged me to question things. In the beginning, I wanted to become a paediatrician, but with time, I realised that it was not for me. My interest in space arose in secondary school: the size of the Universe amazed me, its beautiful nebulae and galaxies inspired me, and I was awed by its violence. Back then, I realised I wanted to learn more about our place in it. I got my first telescope at the age of 17 and have been involved in science since then. I will never forget the first time I saw Saturn through my telescope – breathtaking!

What do you most enjoy about working in science? What are the drawbacks?

I enjoy everything – the excitement of learning about new discoveries, meeting the people behind the discoveries, seeing years of hard work pay off, all in the name of humanity. Scientific advances are meant to improve our quality of life and further our understanding of where we come from and where we are headed.

The only drawback is that sometimes I have to work in the middle of the night, for example when there is a launch. But, in the end, even that is not a drawback, because I must say that I truly enjoy it. I am extremely lucky to have a job in which I learn new things every single day.

Tell us about some particularly memorable moments in your career.

Oh my! I have had quite a few memorable moments in my career – it has been quite varied. In 2006, while I was working as a science communicator at the Teide Observatory, I had the pleasure of accompanying space engineer Lester Waugh and Chris Draper, industrial manager at the aerospace company EADS Astrium, when they came to Tenerife to test the motor system for the first of the ExoMars missions^{w5}, to be launched in 2016. We conducted various tests in and near the Observatory, as the conditions of the soil there are similar to those on Mars. That was my first true contact with space – science professionals. Until then, I had mainly dealt with telescopes and astronomical discoveries.

Another highlight was definitely being able to participate in activities relating to the International Year of Astronomy at ESO in 2009, particularly the ‘Around the world in 80 telescopes’ project^{w6}, in which we connected live with 80 observatories worldwide, non-stop for a full 24 hours.

The latest highlight of my career has been covering the first-ever comet landing by the Philae lander on Comet 67P live on Twitter!

What would you like to do next?

At present, I am extremely happy where I am. In future, I would like to continue working for the science and space industry doing what I do – continuing to communicate the wonders of Earth and the Universe, and the people behind the discoveries. Nothing inspires me more.

BACKGROUND

The Teide Observatory, where Karin worked earlier in her career





Artist's impression of the Rosetta mission, showing the deployment of the Philae lander to Comet 67P

Image courtesy of ESA

Physics

Web references

w1 – The European Space Agency (ESA) is Europe's gateway to space. Its mission is to shape the development of Europe's space capability and ensure that investment in space continues to deliver benefits to the citizens of Europe and the world. See: www.esa.int

ESA is a member of EIROforum^{w7}, the publisher of *Science in School*.

w2 – The Rosetta mission aims to research the history of how our Solar System was formed by investigating one of the oldest and most primordial of heavenly bodies, a comet. See: www.esa.int/Our_Activities/Space_Science/Rosetta_overview

w3 – ESO is by far the world's most productive ground-based astronomical observatory, with its headquarters in Garching near Munich, Germany, and its telescopes in Chile. See: www.eso.org

ESO is a member of EIROforum^{w7}, the publisher of *Science in School*.

w4 – EMBL is Europe's leading laboratory for basic research in molecular biology, with its headquarters in Heidelberg, Germany. See: www.embl.org

EMBL is a member of EIROforum^{w7}, the publisher of *Science in School*.

w5 – Is there or was there ever life on Mars? ESA's ExoMars programme was established to answer this question. See: <http://exploration.esa.int/mars>

w6 – The webcasts of ESO's 'Around the world in 80 telescopes' project, which were broadcast live on 3-4 April 2009, are available online. See: www.eso.org/public/events/special-evt/100ha

w7 – EIROforum is a collaboration between eight of Europe's largest inter-governmental scientific research organisations, which combine their resources, facilities and expertise to support European science in reaching its full potential. As part of its education and outreach activities, EIROforum publishes *Science in School*. See: www.eiroforum.org



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