Rosetta mission makes history

Clip taken from 'The Sky at Night: Rosetta Update – A Comet's Story', BBC Four.

MAGGIE ADERIN-POCOCK:

Most exciting for the team here at the Open University was the data that streamed in from Ptolemy, their instrument on board Philae. Last week I spoke to Simon Sheridon.

Simon, you're co-investigator on Ptolemy, which is mass spectrometer. Can you tell me what a mass spectrometer will do on the surface of a comet?

SIMON SHERIDON:

Yes, certainly. A mass spec, in its simplest form, it's a way of actually measuring the mass and concentration of atoms and molecules. So what we've actually done is we've shrunk down an instrument you see in the lab around us here and we've actually shrunk it down to a smaller size, about this kind of size, so we can actually do that analysis to find out what is floating around on the surface of the comet, or below this comet.

MAGGIE ADERIN-POCOCK:

So this is chemical composition?

SIMON SHERIDON:

Yes. Our primary aim was to actually try and get a solid sample from below the surface and also we looked at the organics in that sample. As you know, things didn't actually work out as we'd hoped for but we still got a lot of really good data from the instrument.

MAGGIE ADERIN-POCOCK:

So, you did get some data? What sort of results did you get?

SIMON SHERIDON:

Well, it was really interesting because when we hit and we bounced, we were obviously in mid-flight and our instrument came on because it was programmed to come on automatically.

MAGGIE ADERIN-POCOCK:

After contact?

SIMON SHERIDON:

After 20 minutes, yes. So, in those 20 minutes we were going to turn the instrument on and just check everything out to make sure it all worked so we were ready. And at that time the lander was tumbling, rotating, and there was real concern that the whole mission may be lost.

But as that was happening, we were getting data coming back to our instrument, so we were like "Well, something's working." And then when we bounced we got a lot of organic material that actually got into the mass spectrometer some way. We're not completely sure what happened, but we think when the lander hit, it stirred up the organic material and that was very cold, and some of that actually stuck to the actual lander itself. And then as we were bouncing across the surface, we think it was subliming off, so we were like sniffing that mid-bounce.

MAGGIE ADERIN-POCOCK:

I see, so you were detecting it as you were flying?

SIMON SHERIDON:

Yes.

MAGGIE ADERIN-POCOCK:

So what sort of results have you got?

SIMON SHERIDON:

Well, in that first bounce we sampled a lot of organic material.

MAGGIE ADERIN-POCOCK:

So this is carbon-based material?

SIMON SHERIDON:

Yes, exactly, carbon-based material. But it's really intriguing because that first time we touched down, as I was saying, we stirred up a lot of that organic material, which we've analysed, and then where we've come to rest now is in a very different place to what we actually touched down on.

The original site is very active, a lot of material there. Where we are now, it's a very inactive place and it's completely different to where we actually touched down, so certainly with Ptolemy what we've been able to do is we've been able to look at the gasses that are coming off the surface and we're seeing completely different signatures in gasses.

MAGGIE ADERIN-POCOCK:

The finding of organic material on the comet confirms previous analysis from Earth, but the variation in the chemical composition across the surface is a new discovery. This is the first time we've had this level of insight into the construction of a comet.