



Mission to Titan

Titan: revelations

Lucie:

Well I'm actually here with Ralph Lorenz who worked on the penetrometer instrument as a PhD student. Ralph, how long ago was that?

Ralph Lorenz, Co-Investigator SSP:

That was ten years ago we put the final finishing touches to it, and I started working on it twelve or thirteen years ago.

Lucie:

Did you ever think that you would have handled the first instrument to touch Titan?

Ralph Lorenz:

Well that was always the hope, of course, and now that's hope turned into reality, it's great.

Lucie:

Okay, and what date have you got to show us – I think it's a star date exclusive?

Ralph Lorenz:

Yes, this is first public showing, this is a force record, a twentieth of a second long.

Lucie:

A twentieth of a second across here?

Ralph Lorenz:

Yeah. On this thing, the sibling of this unit is the one that's on Titan right now and as it gets rammed into Titan's surface when the probe touches down, it records this signature.

Lucie:

Okay, and what kind of surface do you think this represents?

Ralph Lorenz:

Well it looks like something that resisted before it had to be compressed, so it's something like a clay or wet sand, or maybe a slightly compressed snow. It has this little spike at the beginning, maybe a crust, or maybe a little rock. If I were to pick two words: crème brûlée.

Lucie:

That's fantastic. Thank you ever so much, Ralph.

Ralph Lorenz:

Pleasure.

Lucie:

Back to you, Adam.

Adam Hart-Davis:

Then after many of the teams had worked through the night, more revelations about Titan began to emerge.

Dr Marcello Fulchignoni, Principal Investigator for HASI:

We put on the ground something that would allow you to hear ourselves. May we have the acoustic sounds, please? So this is the sounds that you can hear if you were seated on the probe descending.

Adam Hart-Davis:

So these are the sounds recorded by Marcello Fulchignoni's instrument as Huygens descended through the atmosphere. What are we hearing? Wind buffeting the probe?

Dr Marcello Fulchignoni:

Two hours and half...

Jean-Pierre Lebreton, Huygens Project Scientist:

I'm very, very happy to report that we have received a very goodwhich will surely allow us to achieve all our objectives, and probably more than what we had initially set up. A very ambitious objective but we haveourselves to do that. We can now start to see a clearer picture of Titan emerging.

Adam Hart-Davis:

Now John, we've seen a fair few results already. When are we going to get some more?

Prof John Zarnecki, Open University:

Well, we are already committed to producing the first scientific papers within just a matter of weeks which, of course, is very fast in the scientific world, but we shall continue to analyse the data for two or three years to come and, in fact, I expect the planetary scientists will be using this data in fact for decades.

Adam Hart-Davis:

Right now, we've seen some fabulous photographs, we've heard about your penetrometer, what other sorts of information are you getting?

Prof John Zarnecki:

Well, we've seen just recently a temperature profile, so this is the way that the temperature varies in the atmosphere throughout the descent, and what we seem to see is similar to the Earth but there is a minimum in temperature at some height up in the atmosphere.

Adam Hart-Davis:

Kilometres up?

Prof John Zarnecki:

Kilometres up, yes. This minimum is minus 200 degrees centigrade and then we warm up by about twenty degrees by the time we reach the surface.

Adam Hart-Davis:

Right. And I gather you had some sonar thing on board pinging away?

Prof John Zarnecki:

That's right, sending out a sound wave in front of the probe. Now we're looking at this data but we see some evidence, we think for some echoes, once again at height in the atmosphere, so if that's true we're wondering what on earth can be causing that. We think it might be because the probe is passing through clouds, and if these clouds are laden with liquid so rain clouds, or Titan's version of rain clouds, that could provide a target, if you like, to give you...

Adam Hart-Davis:

Send an echo.

Prof John Zarnecki:

...back to the probe.

Adam Hart-Davis:

But it's got to have liquid in it, has it?

Prof John Zarnecki:

It's got to have liquid to give us an echo.

Adam Hart-Davis:

Okay, and when the sonar got near the ground did you see the ground coming in?

Prof John Zarnecki:

Yes, for at least the last hundred metres we got an echo from the ground and when we, we see in these pulses, in these echoes that they're quite complicated, so in those pulses there is some information about the ground, but we've got to really unfold that to understand what they mean.

Adam Hart-Davis:

And match it with the photographs obviously.

Prof John Zarnecki:

Quite.

Adam Hart-Davis:

Well that's fantastic, thanks very much indeed. So, there you have it. We were privileged to see an amazing day here at Darmstadt, extraordinary excitement among the scientists, fabulous data coming in, and it's going to take years to unpack the results, but meanwhile history is being made. Thank you John, from John and me and from Darmstadt, goodbye.