



TRANSCRIPT «VNR PULSE»

TC In: 00:03:00:00

TC Out: 00:08:16:00

Program duration :05'16''

Voice Over

Tc in: 00:03:07:00

Located south of Manchester, Jodrell Bank Observatory has one of the world's largest Lovell telescopes. 76 m in diameter, this powerful radio telescope receives radio electric signals emitted by the entire universe

ITV Andrew Lyne

Tc in:00:03:22:00

"Radio astronomy is using radio waves to study the universe, instead of optical waves, or x-rays, or ultra-violet. It is electro-magnetic radiation but they are very long wavelengths. And we see quite different phenomena when we look at the universe through radio eyes with the big telescopes we have like this one we have here at Jodrell Bank. So the function of these big telescopes is to collect all the radio waves, and bring them to a point that we call the focus. At the focus we have an aerial, and an amplifier, a very sensitive amplifier, which is cooled down to very close to absolute zero. The signals are then amplified, and they come down through cables into the receiver room with computers in, where they are then processed, and eventually the signals go on to disks and we can then look at them on the computer."

Voice Over

Tc In : 00:04:17:00

Invisible to optical telescopes, certain celestial objects can only be observed by radio astronomy. For 10 years or so, scientists from all over Europe have collaborated to optimise the observation of so-called pulsars.

ITV John Serradakis

Tc In: 04:32:00

« Pulsars form when a supernova explodes. In these explosions, the external layers of the star disintegrate and the internal layers, i.e. the core, can then form a high-density neutron star called a pulsar. Pulsars are in fact minuscule stars 10 to 20 km in diameter. They have a very powerful magnetic field and effect a rapid rotation movement, which causes them to emit luminous beams like a lighthouse. »

ITV Ben Stappers

Tc In:00:05:12:00

This is the sound of the crab pulsar, the pulsar is associated with the supernova that went off in human history. We know that from the sound that the pulsar rotates at around thirty times per second. And you can see here the pulse profile of the light curve from the pulsar that shows two peaks that come from the magnetic poles of the pulsar.



Voice Over

Tc In : 00:05:38:00

Real celestial clocks, these pulsars are an inexhaustible source of information for Europe's scientists who want to test the fundamental laws of physics. Their objective: to determine the precise nature of the universe!

ITV Axel Jessner

Tc In :00:05:50:00

« Pulsars are at the very heart of modern physics. Extreme conditions for physical experiments are focused in these small spaces, and we can study matters such as solid physics, quantum mechanics, the general theory of relativity, thermodynamics and plasma physics. The conditions there are so extreme that it would be impossible to find a laboratory on earth which would allow these kinds of phenomena to be studied without, at the same time, destroying our planet »

Voice Over

Tc In:00:06:20:00

To study the stars, the pulse project brings together scientists from Manchester, Capoterra, Bonn, Dwingeloo and Thessaloniki.

By networking telescopes located throughout Europe, these scientists have been able to discover and investigate more than 800 pulsars in 10 years.

ITV Nicolo D'Amico

Tc In: 00:06:45:00

« What has made a great contribution to the discovery of such a rich sample of new pulsars in a few years - approximately 800 in a decade or so -, has been the development of multi-beam receptors. These are receptors which allow several parts of the universe to be observed at the same time. And they are all used on the same radio telescope. We can easily proceed to the research phase on new pulsars using one large radio telescope. To monitor these objects, however, you need several different radio telescopes - hence the importance of the European network. »

Voice Over

Tc In: 00:07:18:00

One of the high points of this important collaborative research: the discovery of a double neutron star. These two celestial objects have an orbital separation which is smaller than the sun

ITV Marta Burgay & Andrea Passenti

Tc in : 00:0:31:00

« At the end of 2003, our group of researchers discovered a unique system. It's a double pulsar. For 30 years, scientists had been looking for a system like this - since the moment the first pulsar was discovered in a binary system. »

« The speed of the two stars in the system and the orientation of the system itself compared to the viewing angle increases all the effects of relativity such that it will allow us to verify Albert Einstein's theories like no other system before it. »

Voice Over

Tc In: 00:08:01:00

For all these discoveries the PULSE project is a winner of the Descartes Prize 2005 for excellence in scientific Research awarded by the European Commission.



International Version

Tc in : 00:08:30:00

Tc out : 00:13:46:00

B Roll

ITV Andrew Lyne

00:14:30:00

ITV John Serradakis

00:15:25:00

ITV Ben Stappers

00:16:09:00

ITV Axel Jessner

00:16:39:00

ITV Nicolo D'Amico

00:17:07:00

ITV Marta Burgay & Andrea Passenti

00:17:44:00

Buiding & radio telescoe images

00:18:23:00

Radio graph

00:18:38:00

Radio telescope and machines images

00:18:50:00

Animation

00:19:30:00

Pulsar Graphic

00:20:10:00

map

00:21:00:00

Radio telescope animation & images

00:21:30:00