



PRESS RELEASE No 5

Center for Social Communication / CBPF

[For immediate release]

What: Researchers from the Voyager mission can announce that one of the twin probes left Solar System

When: From 02-09 July this year.

Where: Centre SulAmérica Convention.

Why: To present the latest scientific results in the physical area.

Attention! All press releases are available (in English and Portuguese) in <http://www.cbpf.br/~icrc2013/imprensa.html>

ANNOUNCEMENT THAT FIRST HUMAN ARTIFACT ENTERED DEEP SPACE CAN OCCUR IN MEETING IN RIO

The ICRC (International Cosmic Ray Conference) - taking place for the first time in a city in South America - will bring the announcement that one of the probes of the Voyager mission just left the confines of the solar system, in presentation by the researcher who has devoted nearly 40 years of his life to this space mission

Rio de Janeiro, May 2013 - The ICRC (International Cosmic Ray Conference, <http://www.cbpf.br/~icrc2013>) - which will take place in the city of Rio de Janeiro, and for the first time in South America - will have the announcement that the longest journey undertaken by mankind has just reached a milestone: for the first time, an artifact made by man leaves the limits of the solar system, entering a new field of exploration for science.

The artifact, in this case, is the U.S. probe Voyager I, which, after 36 years of

traveling, and have gone about 19 billion miles into the cosmos - about 125 times the Earth-Sun distance - will now enter the so-called deep space, leaving behind the zone under the influence of the solar magnetic field, known as the heliosphere. This enormous region serves as a kind of shield that protects the planets from the bombing of ultra-energetic cosmic particles.

By entering deep space, Voyager I, with its scientific instruments, will have the chance to make an unprecedented measure: the value of the magnetic field of nearest stars in the Solar System.

The announcement may be made in the presentation of the American researcher who has devoted 36 years of his life to the Voyager mission: Ed Stone of the California Institute of Technology.

Launched respectively in August and September 1977, the two probes, Voyager I and Voyager II, have already discovered and unraveled mysteries about the planets Jupiter, Saturn, Uranus and Neptune. For example, Voyager II, in 1986, discovered two new rings and 10 new moons on Uranus.

To learn more (in English) about the Voyager: <http://voyager.jpl.nasa.gov/>

Scientists from around the world - The 33th edition of the ICRC, held from 2-9 July this year, at the SulAmérica Convention Center in the city of Rio de Janeiro, will be the first event of its kind to take place in South America

It is estimated that about 1000 scientists around the world - among them, renowned international experts - will come to Brazil for the seven-day conference.

The first edition of the ICRC - as this meeting is best known by the international physics community - occurred shortly after the end of World War II, and since then has happened every two years. The last two meetings were in Beijing (China) in 2011, and Lodz (Poland) in 2009.

Mysteries of Nature - The ICRC is traditionally dedicated to topics related to the physics of cosmic rays and high energy astrophysics and particle astrophysics. But it also attracts scientists working on topics related to gamma rays and neutrinos - for technical terms, see "**Glossary**" at the end of this release.

In the Brazilian edition of the event, there will be for the first time direct involvement of the community studying the mysterious dark matter. For this reason, the ICRC adopted the subtitle 'The Conference of Astroparticle Physics.'

Over 300 scientific lectures are planned for the event - in plenary and parallel

sessions - as well as several lectures for the general public.

Organization - The Brazilian edition of the ICRC is being organized by the Brazilian Center for Physics Research (CBPF) - an institute of the Ministry of Science, Technology and Innovation (MCTI) - Federal University of Rio de Janeiro and the Brazilian Physics Society, sponsored by the National Council for Scientific and Technological Development (CNPq), the Coordination for Improvement of Higher Education Personnel (CAPES) and the support from Research Foundations of Rio de Janeiro (FAPERJ) and São Paulo (FAPESP).

Prize-- In the ICRC, are traditionally presented the prizes of the IUPAP (International Union of Pure and Applied Physics) for research in cosmic ray physics and particle astrophysics.

Tradition - Last year, we celebrated the 100th anniversary of the discovery of the origin of cosmic rays. The experiments that led to the conclusion about the extraterrestrial origin of this radiation yielded the Austrian physicist Victor Hess (1883-1964) the Nobel Prize in Physics in 1936.

Brazil has a long tradition in related areas to the meeting, with researchers involved in several international scientific collaborations dedicated the study of the most energetic particles in the universe, such as the Pierre Auger Observatory in Argentina (www.auger.org), the European laboratory CERN (European Organization for Nuclear Research) in Switzerland (www.cern.ch), and the CTA (*Cherenkov Telescope Array*) (www.cta-observatory.org), the most important experiment in high energy astrophysics in the next decade and whose operations should begin by 2018 - with a great chance of being installed in South America.

The cosmic ray physics has as one of its pioneers in Brazil, the physicist César Lattes (1924-2005), founder of CBPF in 1949 and one of the discoverers, in the late 1940s, of the so-called pi meson particle, that serves as 'glue' of protons and neutrons, keeping the atomic nucleus cohesive.

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GLOSSARY

Cosmic rays - are atomic nuclei - some extremely energetic, the most energetic particles known by science - that bombard the Earth all the time, from space. When they collide with atoms in the atmosphere, creating a 'shower' of particles - sometimes billions - that reach the ground. The less energetic ones come from the Sun, the average energy are generated when massive stars explode at the end of their lives. The ultra-energetic ones probably are created in black holes that occupy the core of some galaxies.

Dark Matter - We know only 5% of the constitution of the universe. There is evidence that the remaining 95% are divided into: i) dark matter (about 25%) and ii) dark energy (70%). Dark matter can only be detected by the gravitational pull it exerts on other heavenly bodies, because it does not emit any type of light - hence the term 'dark'. Its nature is still a mystery to science. Already dark energy plays a similar role to a 'antigravity' and is suspected to be responsible for making the universe expand at an accelerated rate.

Gamma-ray bursts - are the most energetic events of nature since the birth of the universe, called *Big Bang*. One of these explosions can emit energy in the form of extremely energetic light (gamma rays), equivalent to that obtained by the total evaporation, in seconds, of the weight of a thousand planets like Earth.

Neutrinos - They are the most elusive particles known to science. Can pass through a wall of lead with about 10 trillion km thick without colliding with atoms. Are created in abundance in the universe: the stars, cosmic rays on Earth, nuclear plants, the natural radioactivity of our planet and even the human body - each of us, because of radioactive elements in our bodies, emits about 10 million neutrinos per hour. Every second, trillions of neutrinos pass through our bodies - and therefore the Earth - almost without interacting with matter.



[End of release]