



**PRESS RELEASE No 1**

**Center for Social Communication / CBPF**

**[For immediate release]**

**What:** Rio will host one of the most important scientific meetings in the world.

**When:** From 02 to 09 July this year.

**Where:** SulAmérica Convention Center.

**Why :** To present the latest scientific results in the physics area.

**BRAZIL WILL HOST ONE OF THE  
MOST IMPORTANT MEETINGS OF PHYSICS  
IN THE WORLD**

**For the first time in South America, the ICRC - International Cosmic Ray Conference - will be attended by about a thousand Scientists from around the world. The meeting will discuss the latest findings in the physics of cosmic rays, the Sun, gamma-ray bursts and dark matter.**

**Admissions and paper submissions will close on March 01.**

**Rio de Janeiro, February 2013** - The 33<sup>rd</sup> edition of the ICRC (*International Cosmic Ray Conference*)- one of the largest, most important and traditional gatherings of the physical world - will take place between 02 and 09 July this year, in the SulAmérica Convention Center in the city of Rio de Janeiro.

It is first time the event will take place in South America

It is estimated that about 1 000 scientists from around the world - among which renowned international experts - will come to Brazil for the seven-day conference.

A first edition of the ICRC - as this meeting is best known by the international community of physics - 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 focuses on topics traditionally linked to the physics of cosmic rays, high-energy astrophysics and particle physics. But it also attracts scientists working on topics related to gamma rays and neutrinos - for the technical terms, see "**Glossary**" at the end of this release.

This year in Brazil, for the first time, there will be the participation of the community that studies the mysterious dark matter. For this reason, the ICRC adopted the subtitle 'The Astroparticle Physics Conference.'

Over 300 scientific lectures are planned - in plenary and parallel sessions - as well as several lectures for the general public.

**Admissions and work submission** - Registration and submission of papers are accepted until March 1. This should be done at the meeting site: <http://www.cbpf.br/icrc2013>  
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**Organization** - The Brazilian edition of the ICRC is being organized by the Brazilian Center for Physics Research (CBPF) - organ of the Ministry of Science, Technology and Innovation (MCTI) - the 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 Foundations of Research Support of Rio de Janeiro (FAPERJ) and São Paulo (FAPESP).

**received awards** - At the ICRC are traditionally presented the awards of IUPAP (International Union of Pure and Applied Physics) for research in physics and cosmic rays, as well as 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 guaranteed 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 various international scientific collaborations dedicated to study the most energetic particles in the universe, such as the Pierre Auger Observatory in Argentina

([www.auger.org](http://www.auger.org)), the European laboratory CERN (European Center for Nuclear Research) in Switzerland ([www.cern.ch](http://www.cern.ch)) and CTA (*Cherenkov Telescope Array*) ([www.cta-observatory.org](http://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 physics of cosmic rays had as one of its pioneers the Brazilian 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, which serves as a particle 'glue' for protons and neutrons, holding the atomic nucleus together.

**Media Contacts:**

**Ulisses Barres**, CBPF

[ulisses@cbpf.br](mailto:ulisses@cbpf.br)

(21) 2141-7192

**Ronald Cintra Shellard**, CBPF

[shellard@cbpf.br](mailto:shellard@cbpf.br)

(21) 2141-7331

**SulAmérica Convention Center**

**Address:** Av Paulo de Frontin, 1,  
New Town, Rio de Janeiro (RJ), 20260-010

**Tel:** (21) 3293-6700

**Season:** Flag Square

**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 they create a 'shower' of particles - sometimes billions of them - that reach the ground. The less energetic ones come from the Sun whereas the average energy particles are generated when massive stars explode at the end of life. The ultraenergetic cosmic rays are probably created in black holes that occupy the core of some galaxies.

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

**Dark Matter** - Only 5% of the constitution of the universe is directly known. 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 celestial bodies, because it does not emit any form of light - hence the name 'dark'. Its nature is still a mystery to science. Dark energy plays a similar role to 'antigravity' and scientists suspect it is responsible for making the universe expand at an accelerated rate.

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



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