

PROGRAM IN BOGOTÁ 26-27 NOVEMBER 2015

Time/Day	Thursday 26 Nov	Time/Day	Friday 27 Nov
8:45-9:00	OPENING	8:30-9:20	Comerón
9:00-9:50	Ruffini	9:20-10:10	Mirabel
10:00-10:45	Obra mapping 3D "Albert el triunfo de la imaginación"	10:10-10:30	COFFEE BREAK
10:45-11:10	COFFEE BREAK	10:30-11:10	Barres
11:10-12:00	Mirabel	11:10-11:50	Forero
12:00-12:50	Izaurieta	12:00-14:00	LUNCH BREAK
		14:00-14:40	Granda
		14:40-15:20	Martínez
		15:20-15:40	COFFEE BREAK
		15:40-16:20	Nuñez
		16:20-17:00	Rueda

TITLES AND ABSTRACTS PER DAY

Thursday (November 26)

Lectures for General Audience

Place: Domo Planetario de Bogotá

- Remo Ruffini (Director of ICRANet-Rome, Italy):

Title: Supernovae, Neutron Stars, Black Holes and Gamma ray Bursts: in celebration of the Golden Jubilee of Relativistic Astrophysics

Abstract:

Place: Auditorio Planetario de Bogotá

- Félix Mirabel (CEA Saclay Service d'Astrophysique-France, IAFE-U. Buenos Aires, Argentina):

Title: Black holes in the Universe in the last decades

Abstract:

It was obtained observational evidences on the existence of black holes, of stellar mass as well as with masses equivalent to millions, even billion solar masses. These astrophysical black holes are sources of phenomena of very high energies in the universe, and constitute unique laboratories to confront with observations the theories at the frontier of physics. I shall show that, besides being objects of interest for physics, black holes of various sizes played an important role in the evolution of the cosmos, and in the formation and the evolution of the galaxies, since the "Dark Ages" of the Universe more than 13 billion years ago, until our days.

- Fernando Izaurieta (Universidad de Concepción, Chile):

Title: 100 Años de Espaciotiempo: Celebración del Centenario de la Relatividad General de Einstein

Abstract:

Hace un siglo, Albert Einstein formuló uno de los conceptos más difíciles de comprender de toda la Física: el espacio y el tiempo están unidos en una sola entidad dinámica, cambiante, cuya geometría se curva y vibra bajo la influencia de la materia.

Esta idea revolucionaria es la Teoría de la Relatividad General. Tuvo un origen humilde, con un joven Einstein soñando con cómo sería montar un rayo de luz. Pero finalmente nos ha llevado a comprender desde el origen del Universo a partir del Big Bang hasta entidades tan extrañas y misteriosas como los Agujeros Negros, en cuyo centro el tiempo mismo parece finalizar. Un siglo después de su formulación, las ideas de Einstein son más fructíferas que nunca. Estamos en frente de grandes interrogantes por resolver, como qué son la Materia y Energía Oscuras o la naturaleza de la geometría espaciotemporal a nivel cuántico. Tratando de resolver estos y otros misterios nos hemos encontrado con ideas tan excitantes como Dimensiones Extra, el Multiverso, Supergravedad y Teoría de Cuerdas.

Friday (November 27)

Morning: Technical Scientific Talks

Place: Auditorium of the “Ciencia y Tecnología CyT” building at Universidad Nacional de Colombia - Bogotá

- Fernando Comerón (Representative of the European Southern Observatory – ESO in Chile):

Title: Highlights of the program of the European Southern Observatory

Abstract:

The European Southern Observatory (ESO), currently one of the world-leading organizations in astronomy, is beginning the construction of the European Extremely Large Telescope (E-ELT), which will become the largest telescope in the world when it enters operations in the mid-2020s. In many ways the current ESO program is paving the way for the E-ELT, both technically and scientifically, and it also offers a combination of facilities that cover a wide range of astronomical goals. Some highlights of current and planned facilities will be presented, with special mention to GRAVITY, a new instrument designed to test the close environment of the black hole at the center of our Galaxy.

- Félix Mirabel (CEA Saclay Service d'Astrophysique-France, IAFE-U. Buenos Aires, Argentina):

Title:

Abstract:

- Ulisses Barres de Almeida (CBPF-Rio de Janeiro, Brazil):

Title: Astroparticle Physics in South America: CTA and the synergy with current and future facilities.

Abstract:

In this talk I will introduce the current scenario for astroparticle physics in South America, a field which is strongly developing in the continent. The talk will concentrate on a detailed presentation of the status of the Cherenkov Telescope Array (CTA) project, which is the main dedicated observatory in the field, to be installed in the Chilean Andes, near Paranal, and with installation of prototypes planned to start in 2017. A number of other astroparticle physics projects are either in activity or planned for the continent in the next decade, and I will discuss some of them and the potential synergies these could have with CTA. A background to the whole presentation is the potential network of facilities and collaborations in astroparticle physics which is building up in the continent and which should mature and further develop to respond to the great scientific potential present for the field in this special corner of the world.

- Jaime Forero (Uniandes-Bogotá, Colombia):

Title: The Cosmic Web as a Cosmological Probe

Abstract:

I will review recent advances in the techniques to observe and simulate the large scale structure of the Universe as traced by galaxies in large spectroscopic surveys. In this context I will show how the redshift dependence of the Alcock-Paczynski test can be used to measure the expansion history of the Universe. I will close by summarizing future observational prospects to measure cosmological parameters in the high redshift Universe, focusing on the Dark Energy Spectroscopic Instrument (DESI), a new spectroscopic survey planned to start in 2018.

Afternoon: Technical Scientific Talks

Place: "Parainfo Edificio Insignia Julio Garavito Armero" at Universidad Nacional de Colombia - Bogotá

- Luis Norberto Granda (Univalle-Cali, Colombia):

Title: Dark Energy and the expanding universe

Abstract:

The cosmology has undergone a revolution since the discovery of the accelerated expansion of the universe at the end of the 1990's. Since then, physicists have been developing theories about what causes this accelerated expansion, which was called dark energy. The simplest candidate for dark energy is the cosmological constant, but it suffers from the known problem of fine tuning. Many dynamical approaches to dark energy have been proposed by using scalar fields of different nature or by modifying the gravity at cosmological distances. We are at the very beginning of the quest to understand this fundamental problem, and the final answer is still far away.

- Roberto Martínez (UNAL-Bogotá, Colombia):

Title: Dark matter o partículas inertes.

Abstract:

Haremos una breve presentacion de los datos mas relevantes que permiten concluir la existencia de la materia oscura a nivel galactico. Presentaremos un modelo de fisica de particulas elementales invariante de gauge $SU(3)_C \times SU(2)_L \times U(1)_Y \times U(1)_X$ con tres familias de fermiones y libre de anomalias. Dicho modelo contiene una corriente neutral adicional y puede explicar correctamente la oscilacion de neutrinos y las diferencia de masas. El modelo contiene un campo escalar singlete $SU(2) \times U(1)$ como candidato a materia oscura. Con el campo escalar se puede explicar la densidad requilia de materia oscura y ademas, para un conjunto de parametros del modelo, todavia no es excluido por los datos experimentales de LUX para deteccion directa de materia oscura.

- Luis A. Nuñez (UIS-Bucaramanga, Colombia):

Title: Launching Cosmogeophysics at Eastern Colombia

Abstract:

We present updated panorama of Astroparticle at Eastern Colombia describing several ongoing projects. Particularly we shall show recent advances in using astroparticle techniques to study volcanos in Colombia. We shall also present recent advances concerning Latin American Giant Observatory, LAGO-Collaboration.

- Jorge A. Rueda H. (ICRANet-Rome, Italy):

Title: Neutron stars in relativistic astrophysics: the case of gamma-ray bursts and supernovae

Abstract:

I will give a review of the salient properties of the interior equation of state and structure of rotating neutron stars (NSs) as well as the consequent exterior spacetime properties. Then, I will discuss an application of the knowledge of the NS properties in an extreme astrophysical system: the energetic long-duration gamma-ray bursts (GRBs) associated with type Ic supernovae (SNe). For this I focus on the induced gravitational collapse (IGC) scenario that introduces a binary system as the progenitor of GRB-SNe: a carbon-oxygen (CO) core forming a compact binary with NS. The explosion of the CO core triggers a massive accretion process onto the NS bringing it to the critical mass value, inducing its gravitational collapse to a black hole with consequent emission of the GRB. I will show our most updated results from numerical simulations in full general relativity of the entire process from the SN explosion all the way up to the collapse of the NS.

Additional information on some of the invited speakers of the “First Colombia-ICRANet Julio Garavito Armero Meeting”

-Ulisses Barres de Almeida (Centro Brasileiro de Pesquisas Físicas-Brazil; ICRANet-Italy):

Barres is an expert in high-energy astrophysics with more than 100 scientific publications in this field. Barres is the Responsible for LST Actuator Interface Plates of the Cherenkov Telescope Array (CTA), the Brazilian Representative to the CTA/LST Steering Committee, and Member of the Publication Committee of the MAGIC Collaboration.

- Fernando Comerón (European Southern Observatory – ESO in Chile):

Comerón is from April 2013 the Representative of ESO in Chile; expert in galactic structures, large scale star formation, very low mass stars, brown dwarfs, stellar kinematics, and the dynamics of the interstellar medium.

-Luis Herrera Cometta (Universidad Central de Venezuela – UCV, Venezuela and Universidad de Salamanca – USAL, Spain):

Herrera is considered one of the greatest experts of the Einstein’s theory of general relativity in Latin America. Herrera has published about 200 articles in selected areas of classical general relativity, among them exact solutions of Einstein equations in presence of anisotropy and thermodynamics within general relativity. Under his guide, a school of relativists has flourished in Latin America. For more information:

https://es.wikipedia.org/wiki/Luis_Alfredo_Herrera_Cometta

- Fernando Esteban Izaurieta Aranda (Universidad de Concepción, Chile):

Izaurieta has experience in General Relativity, multidimensional supergravity, and Lanczos–Lovelock gravity, torsional Lagrangian, Chern-Simons theories, M and branes theory. In addition, he is interested in the solutions of general relativity equations as well phenomenology of Cartan’s gravity and cosmology in multidimensional supergravity. For an updated list of publications type “find a izaurieta” at <http://inspirehep.net/> .

- Felix Mirabel (Commissariat aux Energies Atomique et Alternatives-France, Instituto de Astronomia y Ciencias del Espacio-UBA, CONICET-Argentina):

Mirabel led to the discovery of Microquasars, the Apparent Superluminous Motions in the Galaxy, and initiated the multi-wavelength ground base research that led to the discovery of Luminous Infrared Galaxies and Tidal Dwarf Galaxies. Besides, he has worked in several other areas of modern astrophysics (solar system, star formation, galactic structure, active galaxies, compact objects...), integrating observations in all wavelengths, from gamma-rays to radio waves which has led to the publication of more than 600 articles in the highest impact-factor international journals of astrophysics. Mirabel has been Representative and Head of the Office of Science in Chile of the European Southern Observatories – ESO and Director of Research at Commissariat aux Energies Atomique et Alternatives CEA in France. Currently, Mirabel is Conseiller scientifique at CEA in France and “Investigador Superior” of CONICET-Argentina.

- Alvaro Restuccia (Universidad de Antofagasta-Chile):

Restuccia is one of the most recognized researchers in Latin America in field of theoretical

Con una dilatada trayectoria de mas de 40 años como investigador y formador de generaciones de investigadores, es una de las figuras más reconocidas en América Latina en el ámbito de la Física Teórica con importantes contribuciones en supersimetrías, multibranas/superbranas, teorías de calibre, teorías de cuerdas y teorías topológicas.

- Jorge Armando Rueda Hernández (ICRANet):

Rueda is an expert in physics and astrophysics of compact objects such as white dwarfs, neutron stars, and black holes. He has published about 100 articles in topics ranging from exact solutions of Einstein-Maxwell equations to the physics in the interior of neutron stars and accretion processes onto compact stars. He has supervised several PhD theses of Latin American students from Argentina, Brazil and Colombia within the International Relativistic PhD Program – IRAP PhD; and coordinates the ICRANet activities in Latin America, including the *CAPES-ICRANet Program* of academic exchange. For more information:

http://adsabs.harvard.edu/cgi-bin/nph-abs_connect?library&libname=Jorge+Rueda&libid=5451529bd5

-Remo Ruffini (ICRANet):

Remo Ruffini is the founder and current Director of ICRANet. He is one of the fathers of relativistic astrophysics; together with John Archibald Wheeler introduced the modern concept of “black hole”, and he has made several contributions in the field of relativistic astrophysics among them the concept of relativistic boson stars, the black hole mass formula, and the maximum possible value for the mass of a non-rotating neutron star. Remo Ruffini has published about 1000 scientific articles and 10 books in selected topics of relativistic astrophysics and cosmology. For more information:

http://www.icranet.org/index.php?option=com_content&task=view&id=813

https://en.wikipedia.org/wiki/Remo_Ruffini

http://adsabs.harvard.edu/cgi-bin/nph-abs_connect?library&libname=Remo+Ruffini&libid=5451529bd5