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ASTROMEET2022

INTERNATIONAL MEET ON ASTRONOMY AND ASTROPHYSICS

JUNE 20, 2022 | Virtual

ALBEDO MEETINGS
Floor# 3, Advant Building, 99B, Kakatiya Hills, Kavuri Hills, Madhapur Hyderabad, TS 500033
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FOREWORD

It is our pleasure to invite all scientists, academicians, young researchers, business delegates and students from all over the world to attend the International Meet on Astronomy and Astrophysics will be held in Copenhagen, Denmark during June 20-22, 2022.

ASTROMEET2022 shares an insight into the recent research and cutting edge technologies, which gains immense interest with the colossal and exuberant presence of young and brilliant researchers, business delegates and talented student communities.

ASTROMEET2022 goal is to bring together, a multi-disciplinary group of scientists and engineers from all over the world to present and exchange break-through ideas relating to the Astronomy. It promotes top level research and to globalize the quality research in general, thus making discussions, presentations more internationally competitive and focusing attention on the recent outstanding achievements in the field of Astrophysics.

We’re looking forward to an excellent meeting with scientists from different countries around the world and sharing new and exciting results in Astronomy and Astrophysics.

COMMITTEES

Organising Committee

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Eigenstate of Planetary Motion in Real-Particle Field

Zhong-Cheng Liang*

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Abstract
In the theory of real physics, real-particle field is a field composed of elastic particles. In the real-particle field theory, the density field (mass and momentum densities) and velocity field are defined by the statistics of particle mass and momentum. The spatial convolution of density field constitutes a potential field (mass and momentum potentials), and the spatial first derivative of potentials forms an action field (gradient, curl, and divergence fields), The coupling of action field and density field produces a force field (gradient, curl, and divergence forces). The evolution of the potential field satisfies a set of generalized Maxwell equations, the evolution of the action field satisfies a set of Poisson equations, and the motion of objects follow a generalized Navier-Stokes equation. The results show that the attraction in real-particle field is described by the gradient vector, the repulsion is described by a matrix composed of curl and divergence, and the acceleration can be expressed as the affine transformation of velocity. In a dynamic equilibrium field of zero acceleration, the motion of an object can be reduced to the eigenvalue problem of linear algebra. Taking the solar system as an example, each planet motions in its eigenstate, and eigenvalues and eigenvectors provide an affine reference frame. The eigenvector determines the direction of the frame, and the eigenvalue determine the scale of the base vector. The real part of the eigenvalue is the divergence presenting the revolution frequency of the planet, and the imaginary part is the curl caused by the spin of the sun and the planet. The affine frame determines an ellipsoid, the gradient vector determines a plane, and the intersection of the ellipsoid surface and the plane describes the motion trajectory of the planet.

Keywords
Real-particle field; planetary motion, Affine reference frame, Motion eigenstate.

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[3] Z. C. Liang, The origin of gravitation and electromagnetism. Theoretical Physics, 4, 85-102 (2019).
Biography: Dr. Zhong-Cheng Liang is a Professor at Nanjing University of Posts and Telecommunications, China. He received his B.Sc. degree of physics from Nanjing Normal University, and PhD degree of physics from University of Science and Technology of China. With over 30 years teaching and research experiences in physics and electronic engineering,

he published 2 monographs, authored or co-authored more than 200 peer-reviewed articles, authorized about 30 patents, and obtained 3 grants from the NSFC. He is the fellow of the FSFRC; the members of OSA, ACS and SPIE. His research areas include optics and theoretical physics. The main achievement is the establishment of a physics theory based on the elastic particle model, which includes the theories of real-particle field, motion state, and statistical thermodynamics. At present, he focuses on investigating the motion of celestial bodies by using real-particle field theory.

Remnants of First Stars for Gravitational Wave Sources

Tomoya Kinugawa*

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Abstract
We showed that the typical mass of binary black holes (BH-BHs) whose origin is the first star is ~30Msun and mergers of Pop III BH-BH can have sufficiently long merger times to occur in the nearby universe before GW150914 (Kinugawa et al. 2014). The detection rate of the coalescing Pop III BH-BHs is ~ 200 events/yr. This result predicted the gravitational wave events of massive BH-BHs like GW150914 and LIGO paper said 'recently predicted BBH total masses agree astonishingly well with GW150914 and can have sufficiently long merger times to occur in the nearby universe (Kinugawa et al. 2014)' (Abbot et al. ApJL 818,22 (2016)). Thus, there is a good chance to check indirectly the existence of Pop III massive stars by gravitational waves. In this talk, I will summarise the Pop III binary evolutions and the features of Pop III BH-BHs and the detectability of Pop III BH-BHs by the gravitational detectors including future plans.

Keywords
Binary black hole; gravitational wave; first star.

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Biography
Tomoya Kinugawa is an Assistant professor at The University of Tokyo Excellent Young Researcher, Institute for Cosmic Ray Research, Univ. of Tokyo.

The Positron- and Induced γ-Ray Spectroscopy of the Amher System

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Abstract
The flare activity of AM Her polar type systems and its connection with P–P explosions on the surface of white dwarf (therefore WD) are considered. The lines intensities formation is a result of a positron annihilation with free and atomic electrons in surrounding accretion disk are estimated. It is shown that the maxima of the annihilation γ-line intensities shifted towards larger times. The considered energy range is 0.1-30 MeV. It is shown that induced γ-radiation is formed exclusively on the WD surface. The expected duration of the integral γ-burst is from 0.01 to 100 sec. The lifetime of the annihilation lines is comparable to the times of optical flares. We calculated the correlation between the power of flares in γ- and optical ranges. The intensities of the induced γ-radiation lines in WD atmosphere for He, C, and O - elements are found. The presented calculations show that AM Her type systems create favorable conditions for activity in the soft γ-spectrum on the surface of a WD with strong magnetic field . The development of the binary detectors for monitoring and simultaneous registration of optic and γ- radiation detector has been begun.

Keywords
White Dwarfs; Positron Spectroscopy; Thermonuclear flares; Induced γ-radiation.

Biography
Dmirto Doikov was born in Moldova, May 12-th 1959. He graduated in Physics and Astronomy at the Odessa State University in 1981 and obtained a PhD in Astronomy in 1989 (Back Warming Effect in Cool Carbon Stars) in Odessa Astronomical Observatory. Conducted laboratory modeling of dust formation in low-temperature plasma. Determined the structure of the size distribution function of dust particles and applied the obtained results to simulate similar processes in astrophysics. From 2005 foreign member of South Korean scientific group for investigation of interstellar accretion to stars. In November 2017 begin to study of condensation of the dust particle in hard radiation field in the SNR 1987A. In 2017 – 2020 period proposed the positron spectroscopy of Yang SN Remnants and AGN-s periphery. From 2020 investigated induce nuclearγ-ray's spectroscopy of the peripheral AGN zone. In May 7-th 2021 defended the degree of Doctor of Physical and Mathematical Science. In present time he is full professor of physics and head of the Department of Natural and Engineering Science in Odessa National Maritime University, Ukraine.

String Theory and Loop Quantum Gravity: True Theory vs ad hoc Hypothesis?

Renato Carlo Potenza*
Department of Physics and Astronomy, University of Catania and INFN Catania, Italy

Abstract
As physicists know, string theory suggests to replace the 0-dimensional (point) particles of the standard model with 1-dimensional vibrating strings. So each particle world line (1-dimensional)) is replaced with string world sheet (2-dimensional): this avoids formation of singularities when particles are strongly compressed together, giving for the first time an acceptable description of the state of primordial universe. One of the best results of the theory is the natural appearance just in the spectrum of the simplest string of a mass less spin-2 state, which well represents the state of a graviton, suggesting string theory as a first example of quantum gravity. This at the expense of increasing the space time dimensions at least to 11. So the mathematics of the theory becomes very difficult.

On more recent years a second proposal has been made for quantum gravity: the so called loop quantum gravity (LQG). In this case the machinery of the standard model is left unaltered, with the advantage of a much simpler mathematics in the 4-dimensional space time, gaining also here a good explanation of the initial singularity of the universe only through the quantization of the gravity. At the end the two theories show many similarities also due to the appearance in LQG of spin foams, which resemble the world sheets of string theory.

I think that the hypothesis of loop quantum gravity when incorporated inside the standard model can well become a complete theory of matter, as string theory wants also. So the word moves on to the experiments. Only their results can make it possible to choose between these two descriptions of the world. And being an experimentalist I believe that the best way to discriminate between string theory and LQG is to demonstrate the existence of the extra dimensions foreseen by the string theory.

Keywords
Quantum Gravity; String Theory; General Relativity.

Biography
Renato Carlo Potenza Emeritus researcher of the CMS Experiment in CERN, Geneva. In the CMS experiment he worked up to the discovery of the Higgs boson and is still working in search of new physics signals (supersymmetric particles, multiverse, etc). Retired teacher of Neutrino Physics for graduate students of the University of Catania, Italy. Retired professor of General Physics and of Elementary Particle Physics for undergraduate students of the University of Catania, where he has been teaching for nearly fifty years, from Nov.1961 to Oct. 2010,

holding many courses of lectures for students in Physics, Mathematics and Engineering. His research activity began in 1961 in the field of low energy nuclear reactions in the laboratories of Catania, Italy and at the CRNS of Strasbourg, France. It continued in the field of intermediate energy nucleus-nucleus collisions since 1988, with experiments at LBL, Berkeley, California, and at BNL, New York, passing after, in 1995, to the field of elementary particles through the CMS experiment at CERN, whichled in 2012 to the discovery of the Higgs boson, sought for nearly fifty years.

Matter Shear and Vorticity in Conformally Flat Spacetimes

Roger M. Mayala*
University of KwaZulu-Natal, South Africa

Abstract

We consider conformally flat perturbations on the Friedemann Lemaitre Robertson Walker (FLRW) Spacetimes containing a general matter field. Working with the line arised field equations, we unearth some important geometrical properties of matter shear and vorticity, and show how they interact with the thermodynamic quantities in the absence of any free gravity powered by the Weyl curvature. We demonstrate that the matter shear obeys a transverse traceless tensor wave equation and the vorticity obeys a vector wave equation in this line arised regime. These shear and vorticity waves replace the gravitational waves in the sense that they causally carry the information about local change in the curvature of these space times. We also look at the heat transport equation in this case and how this varies from the Newtonian case.

Biography: I completed my undergrad studies at the University of Kinshasa, D. R. Congo. Then, I was a Lecturer at the same university between 2001 - 2015. Later, I received my master's degree in Applied Mathematics in 2018 from the University of KwaZuluNatal, South Africa. After that I began my PhD studies in the same university under the supervision of Prof Sunil Maharaj and Prof Rituparno Goswami. At present, I am a doctoral researcher in the Astrophysics and Cosmology Research Unit, School of Mathematics, Statistics and Computer Science, University of KwaZulu-Natal, South Africa. I'm doing research in the General Relativity. I study the role of the Weyl tensor in general relativistic fluid motion, including spacetime shear.

Simulteneous Monitoring of Fast γ- and Optical Flares of Atmosheric Origin

Mark Doikov*

Faculty of Physics and Technology, "Paisii Hilendarsky" Plovdiv University, branch Smolyan, 32 Colonel Dicho Petrov Street, 4700, Bulgaria

Abstract
In this work, has been proposed binary sensors method for the simultaneous registration of optical and γ-quanta in the Earth's atmosphere and some astrophysical objects. The analysis of the relaxation times of semiconductor detectors in the field of optical and nuclear radiation after the passage of quanta of the indicated ranges through them is carried out. All calculations took into account the low level of the signal-to-noise ratio, the presence of parasitic effects on the accumulation of useful signals. The considered method is applied to the design of a prototype of a binary detector with the aim of fixing fast processes in the Earth's atmosphere caused by the motion of cosmic particles with energies of . An algorithm is proposed for fast filtering of signals during their pickup from multilayer detectors in order to save the memory resources of the device.The minimum registration time is between for γ-quanta and 0.001s for protons and α-particles. Degeneration time of detectors depends from Cosmic Rays (CR) spectra. In case of CR-events in atmospheric heights between 2-4 km is true inequality expression and has important effects on the CR-monitoring results.

Keywords
Binary detectors, Silicon Strip CRγ-Radiationdetectors, Rapid hard radiation signals analyses.

Biography
Mark Doikov was born in Odessa, September 13-th2002. He is student of the Faculty of Physics and Engineering Technologies, University of Plovdiv "PaisiiHilendarski", 28 Colonel Dicho Petrov, 4700, Smolian, Bulgaria. In present time he investigates tracking systems for soft γ-ray detection. Develops an instrumental concept for the registration of rare weak signals from relativistic objects. The main direction of his activity at the present time is the development of hardware programs for the control of such equipment.

The Solar Neutrinos Reveal How the Sun and the Stars Shine

Gianpaolo Bellini*
University and INFN- Milano- Italy

Abstract

The study of very low energy neutrinos requires a suppression of the natural radioactivity up to ultra-traces level. This is what the BOREXINO experiment succeeded to achieve with the development of ad hoc technologies , allowing a threshold down to 50 keV. So, the entire solar neutrino spectrum has been detected, together with a small, but clean and robust geoneutrino signal, providing new achievements in the solar, stars and neutrino physics, as well as opening new horizons in the study of the Earth's interior. Among the results, actual breakthroughs can be counted: the identification of the nuclear reactions which produce 99% of solar energy and then the solar luminosity, with also the demonstration of the solar stability on a 105 years scale; the agreement with the Standard Solar Model predictions of the measured neutrino fluxes, paving the way for a significant hint in favor of the high metallicity composition of the Sun; the independent demonstration of the validity of the MSW neutrino oscillation solution, through the determination in a single experiment of the transition of the electron neutrino survival probability from the vacuumto the matterregime;and finally the first experimental detection of the CNO cycle, which dominates in the massive stars.

Borexino is still now a unique experiment with its unprecedented radiopurity level, which have become a reference standard for the very low physics neutrinos.

Biography

Gianpaolo Bellini Emeritus Professor at the Universita' degliStudi of Milan and Emeritus scientist of the Istituto Nazionale di Fisica Nucleare (INFN). Previously, He was a NATO fellow at the École Normale Supérieure d'Orsay -France (1966-1967); Libera Docenza (License to teach at the Universities) (1967); Full Professor at the Università degliStudi of Milan (1976); CERN Fellow (1984-1985); Guest scientist at CERN, at IHEP at Serpukhov (Russia), at the Fermi National Laboratory (Ill., USA), at Gran Sasso Laboratory (Italy). He has been awarded with the international price Bruno Pontecorvo. He is a member of many physical societies.

Cosmology of Dark Energy

Charles Sven*
Observational & Theoretical Cosmologist, USA

Abstract

Evidence of dark energy found on earth is common place. Just strike a match and the atom electrons fueled by dark energy drive light photons out instantaneously at 186,282 miles per second. That power source is an energy currently undetected by any sensing instruments known beyond our own eyesight. Further, that energy exercise is displayed in firework displays, dynamite explosions, chain reactions, atomic bombs, and in the furnace of stars.
Following that energy trail provides a completely new understanding of our universe allowing me to answer all the most perplexing questions of cosmology including how the Big Bang Banged, how galaxies with individual orientation are formed, what is the Cosmic Microwave Background Radiation, how to visualize the geometry of our universe, and how to compute the age of our universe and its component – atoms.

Most important! That accelerating space expansion is a misreading of manipulated data. Skip the statistical average manipulation and the supernovae scatter plot is better explained by a Pulsating Big Bang Explosion similar to a Pulsating Gamma Ray Burst.

Biography

Charles Sven Observational & Theoretical Scientist immersing myself independently into the study of Cosmology and Space since 1997 that included 7 philosophical and 14 science conference presentations of my evolving work.