

ICRANet Scientific Committee
Twenty first Meeting (e-meeting)
January 29, 2024

The meeting starts at 10:00 AM via GoToMeeting: <https://global.gotomeeting.com/join/750192021>

The following members are present:

Prof. Mimoza Hafizi (Albania)
Prof. Narek Sahakyan (Armenia)
Prof. Carlo Luciano Bianco (ICRA)
Prof. Massimo Della Valle (Italy, Chairman)
Prof. Remo Ruffini (Director of ICRANet)

The additional following persons are present:

Prof. Lorenzo Amati (INAF - OAS Bologna)
Prof. Carlos Raul Arguëlles (ICRANet Adjunct Professor)
Prof. Sergey Bulanov (ELI Beamsline)
Dr Aniello Francesco Izzo (ICRANet internal auditor)
Prof Jutta Kunz (University of Oldenburg, Germany)
Prof. Seyed Mohammad Taghi Mirtorabi (ICRANet Adjunct Professor)
Prof. Rahim Moradi (ICRANet Faculty Professor)
Dr Marco Muccino (University of Camerino, A-Farabi University)
Prof. Carlo Maria Pace (ICRANet Adjunct Professor)
Prof. Tsvi Piran (the Hebrew University of Jerusalem)
Prof. Hernando Quevedo (ICRANet Adjunct Professor)
Prof. Jorge A. Rueda H. (ICRANet Faculty Professor)
Prof. Giorgio Sonnino (ICRANet Adjunct Professor)
Prof. Liborio Stuppia (Rector University G. d'Annunzio Chieti-Pescara)
Prof. Arban Uka (Epoka University, Albania)
Prof. Gregory Vereshchagin (ICRANet Faculty Professor)
Prof. She-Sheng Xue (ICRANet Faculty Professor)

Absents

Prof. Manuel Malheiro (ad interim, Brazil)
Prof. Christopher Fryer (Arizona University)
Prof. John Mester (Stanford University)
Prof. Gabriele Gionti, S. J. (Vatican City State)

The meeting is chaired by the Director, Prof. Remo Ruffini, who also takes the minutes.

Prof. Remo Ruffini assumes the Chairmanship and thanks all the presents for their participation. He then presents the 2023ICRANet scientific report to the Scientific Committee, in particular Volumes 2 and 3, which are composed as follows:

Volume 2

- Multiwavelength and Multimessenger emission from Active Galactic Nuclei (Prof. Narek Sahakyan).....pag. 1-146
- ICRANet-Minsk report (Prof. Gregory Vereshchagin).....pag. 147-166
- Activities with Brazil (Prof. Jorge Rueda).....pag. 167-182
- Gamma-Ray Bursts (Prof. Carlo Luciano Bianco).....pag. 183-348
- Theoretical Astroparticle Physics (Prof. Gregory Vereshchagin).....pag. 349-376
- Generalization of the Kerr-Newman solution (Prof. Hernando Quevedo)..... pag. 377-480
- Cosmology Group of Tartu Observatory (Prof. Jaan Einasto).....pag. 481-498
- Black Holes and Quasars (Prof. Brian Punsly)..... pag. 499-500
- Electron-positron pairs in physics, astrophysics and cosmology (Prof. Shesheng Xue)...pag. 501-746

Volume 3

- From heavy nuclei to black holes (Prof. Shesheng Xue).....pag. 747-1092
- Physics and Astrophysics of Compact Objects (Prof. Jorge A. Rueda H.).....pag. 1093-1194
- Self-gravitating Systems of Dark Matter Particles (Prof. Carlos Raul Arguelles).....pag. 1195-1224
- Supernovae (Prof. Massimo Della Valle).....pag. 1225-1228
- Symmetries in General Relativity (Prof. Donato Bini).....pag. 1229-1336
- Self Gravitating Systems, Galactic Structures and Galactic Dynamics (Prof. Simonetta Filippi).....pag. 1337-1378
- Interdisciplinary Complex Systems (Prof. Christian Cherubini).....pag. 1378 -1430

The Director hands the floor over to Prof. Liborio Stuppia, Rector of the University G. d'Annunzio Chieti-Pescara. He welcomes all the participants and underlines the importance of the collaboration between University G. d'Annunzio and ICRANet, also in view of the upcoming MG17 meeting in July 2024.

The Director thanks Prof. Stuppia for his kind words, and hands the floor over to Prof. Massimo Della Valle, president of the ICRANet Scientific Committee, for his *lectio magistralis* on core collapse supernovae.

The Director then invites ICRANet scientists to illustrate their respective fields of research:

- Prof. Narek Sahakyan, Director of ICRANet Seat in Armenia, illustrates the activities carried on in ICRANet Seat in Armenia in 2023 as well as the scientific results on the topic “*Multiwavelength and Multimessenger emission from Active Galactic Nuclei*”. In particular he mentioned the participation of his group in MAGIC collaboration resulting in large number of publications.
- Prof. Sergey Bulanov recalls the joint application presented to ERC Synergy Grants by ELI and ICRANet. The first evaluation of the application should be announced at the end of February 2024.
- Prof. Jorge A. Rueda H. reports on the topic “*Physics and Astrophysics of Compact Objects*” with the main results on the theory of black holes, neutron stars and white dwarfs applied to analysis of gamma-ray bursts within the Binary-driven Hypernova model. Prof.

Rueda then presents the report on “*ICRANet activities with Brazil*”, emphasizing the collaborations with Brazilian Universities.

- Prof. Carlo Luciano Bianco emphasized that the research topic on “*Gamma-ray bursts*” is by now deeply interconnected with the one on “*Physics and Astrophysics of Compact Objects*” presented by Prof. Rueda. He presents the most recent results obtained on the redshift distribution of the different families of GRB progenitor systems within the BdHN model. He then hands the floor over to Prof. Mirtorabi.
- Prof. Seyed Mohammad Taghi Mirtorabi presents the most recent results on the observations of the very early X-ray emission in GRBs at very high redshifts.
- Prof. Lorenzo Amati presents the new THESEUS space mission, which will be able to give a crucial contribution to the observation of the very early X-ray emission of GRBs at any cosmological redshift.
- Prof. Carlos Arguelles presents the main results on the topic “*Self-gravitating Systems of Dark Matter Particles*”. He summarized the relevant results in fermionic dark matter based on the Ruffini-Arguelles-Rueda (RAR) model reached in 2023. The most remarkable progress has been to demonstrate that the gravitational collapse of fermion dark matter cores leads to the formation of supermassive black holes in the early universe, presenting a solution to the current challenges that the observations of the James Webb Space Telescope of supermassive black holes at high redshift put on the conventional models of supermassive black hole formation and evolution.

At 4.00pm Prof. P. Di Carlo from University G. d’Annunzio accompanies R. Ruffini, C.L. Bianco, M. Della Valle, A. Izzo, H. Quevedo, J.A. Rueda, Arban Uka to visit the rooms of the University Campus in view of the organization of the MG17. They are back at 5.20pm.

- Prof. Tsvi Piran presents a review talk about the Penrose process to extract energy from a black hole.

The Director invites the participants to discuss Item 2 of the agenda “*Miscellaneous business*”.

Nothing remains to be discussed.

The Scientific Committee unanimously approves the Scientific Report and warmly congratulates with the Director for the achievements of ICRANet in 2023.

The Director thanks all the participants and the meeting ends at 6: 05 PM on January 29, 2024.

Prof. Mimoza Hafizi
Representative of Albania



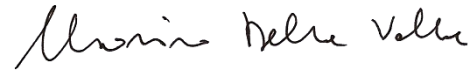
Prof. Narek Sahakyan
Representative of Armenia



Prof. Carlo Luciano Bianco
Representative of ICRA



Prof. Massimo Della Valle
Representative of Italy, Chairman



Prof. Remo Ruffini
Director of ICRA Net

