

Enclosure 4

Activities of the ICRANet Centre in France

ICRANet collaboration with France

Introduction

ICRANet, the International Center for Relativistic Astrophysics Network, is an international organization promoting research activities in relativistic astrophysics and related areas. The founding members of ICRANet are Italy, Custodian of the Agreement, Armenia, the State of Vatican City, Stanford University, the University of Arizona in Tucson, ICRA.

ICRANet has the headquarters in Pescara and others seats in different countries.

- In France ICRANet has the seat at Villa Ratti in Nice, according to an accord with the municipality of Nice, signed on 23 October 2006
(see the act: <http://icranet.org/docs/NiceBailEmphyteotique.pdf>)
- On May 28, 2013 the Director of ICRANet signed with the Prof. Frédérique Vidal, President of University of Nice Sophia Antipolis, the Agreement between ICRANet and University of Nice Sophia Antipolis.
(see the agreement: <http://icranet.org/documents/agreementICRANet-UNICE.pdf>)
- On August 31, 2013 the Director of ICRANet and the Director of Institut des Hautes Études Scientifiques, Jean-Pierre Bourguignon, signed the Agreement between ICRANet and Institut des Hautes Études Scientifiques.
(see the agreement: <http://icranet.org/documents/agreementICRANet-IHES.pdf>)
- The activities of the ICRANet Seat at Villa Ratti in Nice comprise the coordination of the IRAP-PhD program, as well as scientific activities connected with the ultra high energy observations by the University of Savoy and the VLT observations performed by the Côte d'Azur Observatory, which involve the thesis works of IRAP PhD students. The University of Savoy is the closest French lab to the CERN.
- In the IRAP PhD promoted by ICRANet in connection with some of the leading Astrophysical and Physical Institutions in Europe and worldwide (see: https://en.wikipedia.org/wiki/IRAP_PhD_Program)
- During 2010-2017 IRAP PhD takes part in the Erasmus Mundus program of the European Commission and for the first time in Europe the IRAP PhD program grants a joint PhD degree among the participating institutions. This Program has enrolled 5 cycles of students with the total amount of 44 students. The Nice University was the host organization.
- In parallel to the above activities, special attention has been traditionally given by ICRANet to the outreach programs. For example in 2009 has been in Paris the MGXII meeting (see: <http://www.icra.it/MG/mg12/en/>) and, in addition, ICRANet organized in France different meetings:

February 1-19, 2010 – Nice

September 6 - 24, 2010 - Nice

April 3 - 8, 2011 - Les Houches

May 25 - June 10, 2011 Nice

September 5 - 17, 2011 Nice

October 2 - 7, 2011 - Les Houches

September 3 - 21, 2012 - Nice

May 16 -31, 2013 - Nice

September 2 -20, 2013 - Nice

February 23 - March 2, 2014 - Nice

May 10 - 16, 2014 - Les Houches

September 8 -19, 2014 - Nice

May 30 - June 3, 2016 - Nice

June 11 – 14, 2019 - Nice

The ICRA Net Seat Agreement with Municipality of Nice

On October 23, 2006, was signed between Prof. Ruffini, Director of ICRA Net, Mrs Claire Reclus, Deputy Major of the city of Nice, and Mr René Jardillier, notary and doctor in law, the seat agreement (see: <http://www.icranet.org/docs/NiceBailEmphyteotique.pdf>), with the attribution to ICRA Net of a Seat in Villa Ratti.



ICRA Net – Villa Ratti before the restructuring's works– Nice (Fr)



Villa Ratti - Project of the Works

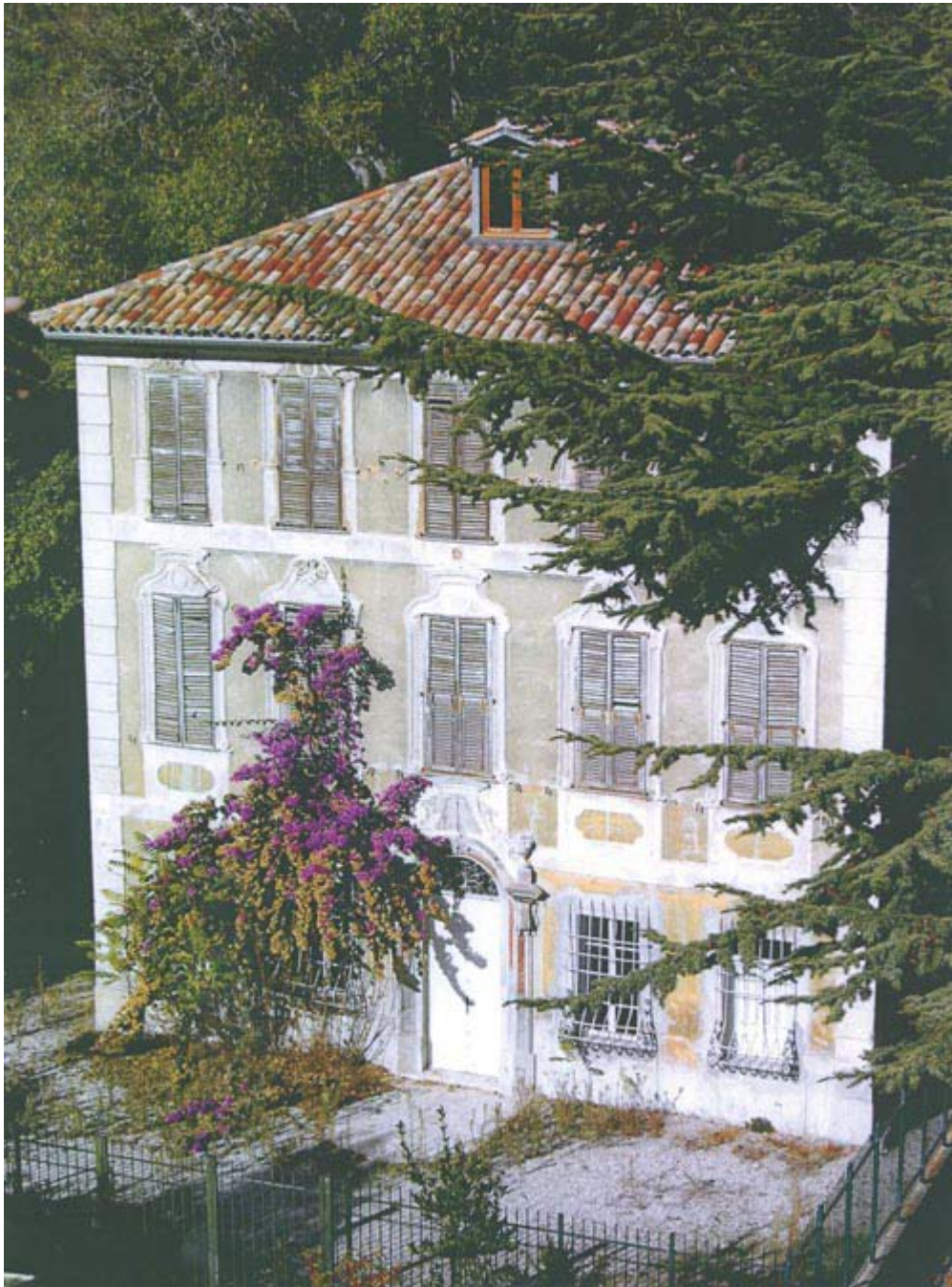


ICRANet – Villa Ratti after the restructuring's works– Nice (Fr)



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ICRANet – Villa Ratti before the restructuring's works– Nice (Fr)



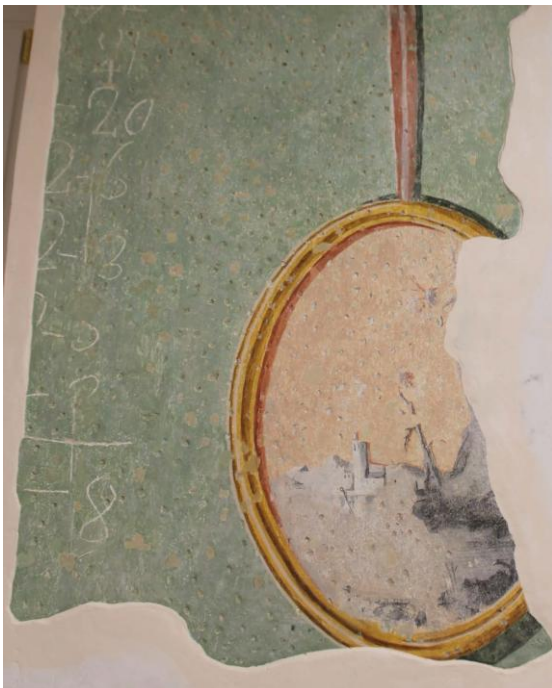


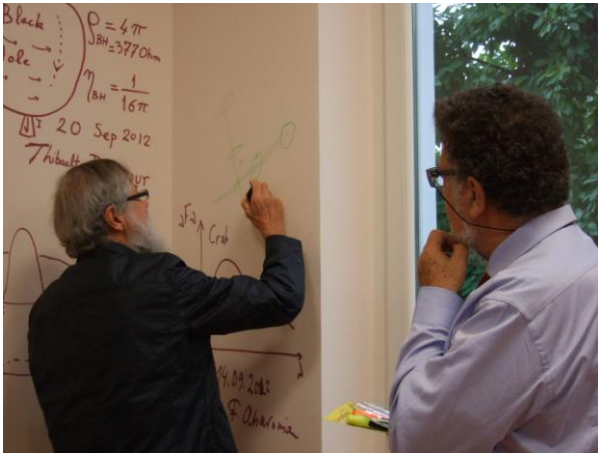
Villa Ratti - Project of the Works

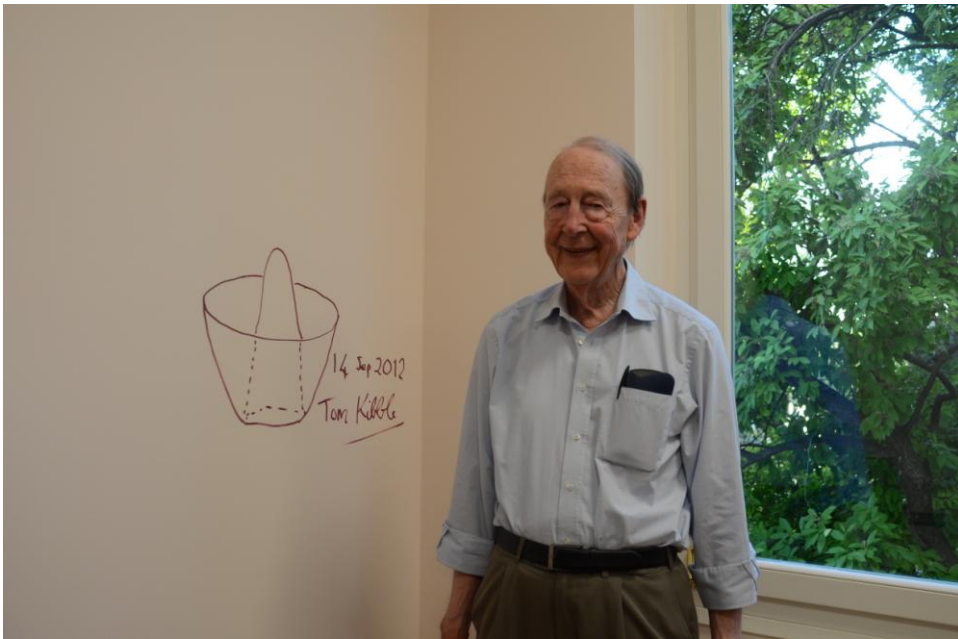


ICRANet – Villa Ratti after the restructuring's works– Nice (Fr)











Open Universe International doctoral School “*The discovery of Black Holes*”, Nice, France, June 11 - 14, 2019

The Open Universe International Doctoral School “*The discovery of Black Holes. How the discovery of a Black Hole in GRB 190114C and in M87 is modifying the human outlook from planet Earth*” has been held at ICRANet Seat at Villa Ratti (Nice - France) from June 11 - 14, 2019. This 5 days conference has been organized thanks to the collaboration among ICRANet, LAPP (Laboratoire d'Annecy de Physique des particules) and the Max Planck Institute for Physics. The opening addresses and the conclusions were given by Professor Remo Ruffini (Director of ICRANet). During this five days conference, a variety of topics in astrophysics were discussed, such as neutrinos, gamma-ray bursts and compact stars, high energy cosmic rays, dark energy and dark matter, general relativity and black holes. The most recent scientific developments were presented by eminent Professors and researchers, such as: Prof. Ulisses Barres De Almeida (CBPF, Rio de Janeiro), Prof. Zurab Berezhiani (Università degli Studi dell'Aquila), Prof. Elisa Bernardini (DESY – Zeuthen, University of Padova), Prof. Paolo Giommi (ASI), Prof. Giovanni Lamanna (Director of LAPP, Annecy), Prof. Mirabel Felix (IAFE), Prof. Jorge A. Rueda H. (ICRANet), Prof. Razmik Mirzoyan (Max Planck Institute for Physics, Munich), Prof. Narek Sahakyan (Director of ICRANet Armenia), Prof. Gregory Vereshchagin (ICRANet), Prof. Shesheng Xue (ICRANet), Dr Martin Kolos (Silesian University in Opava), Dr Arman Tursnov (Silesian University in Opava), Dr Yu Wang (ICRANet), Eduar Becerra (ICRANet), Stefano Campion (ICRANet), Yen-Chen Chen (ICRANet), David Melon Fuksman (ICRANet), Riccardo Middei (Università Degli Studi Roma Tre), Moradi Rahim (ICRANet), José F. Rodriguez R. (ICRANet) and Juan David Uribe Suarez (ICRANet).



Fig. 9: Group photo of the Open Universe International Doctoral School, Nice, 11 – 14 June.

On Wednesday 12, H.E. Simonetta Di Pippo, Director of UNOOSA, sent a video message to the participants to the Open Universe School, in order to outline once again the leading role and the outstanding scientific results achieved by the Open Universe initiative.

For photos, program and more information about the event: <http://www.icranet.org/OpenUniverseSchool>



Fig. 10: Participants of the Open Universe International School, ICRANet Seat at Villa Ratti, Nice.



Fig. 11: Participants of the Open Universe International School, ICRANet Seat at Villa Ratti, Nice.

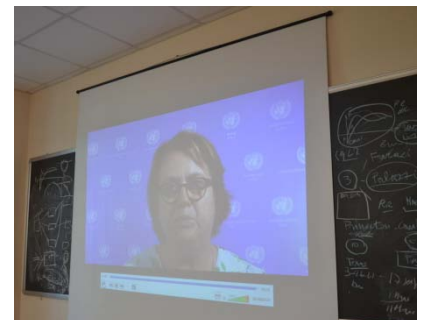


Fig. 12: Video message of H.E. Simonetta Di Pippo, Director of UNOOSA.

Prof. Remo Ruffini Festschrift. A conference in celebration of Prof. Remo Ruffini 80th birthday, May 16-18, 2022, Nice and online

Prof. Remo Ruffini Festschrift, a conference in celebration of Prof. Ruffini's 80th birthday, has been held from May 16 to 18, 2022 at ICRANet Seat Villa Ratti in Nice (France). An hybrid event, both face-to-face and online, was adopted.

More than 90 speakers from 26 different countries joined the conference, delivering scientific presentations, remembering the important role played by Prof. Ruffini in the field of Relativistic Astrophysics, or just sharing with the audience some good memories with Prof. Ruffini and their warmest greetings. Among them: Yerlan Aimuratov (ICRANet, Fesenkov Astrophysical Institute), Lorenzo Amati (INAF OAS), Stefano Ansoldi (University of Udine), Carlos Arguëlles (UNLP, CONICET), Xinhe Bao (President of USTC), Laura Becerra (Pontificia Universidad Católica de Chile), Donato Bini (CNR), Yifu Cai (USTC), Pascal Chardonnet (attaché for scientific cooperation at the French Embassy in Algeria), Pisin Chen (LeCoSpa), Christian Cherubini (University Campus Bio-medico of Rome), Demetrios Christodoulou (ETH Zurich), Zigao Dai (USTC, Nanjing University), Thibault Damour (IHES), Massimo Della Valle (INAF), Nathalie Deruelle (IHES), Hansjoerg Dittus (ZARM, University of Bremen), Simonetta Filippi (University Campus Bio-medico of Rome), Christopher Fryer (Los Alamos National Laboratory), Jianguo Gao, Daniele Gregoris (Jiangsu University of Science and Technology), Mimoza Hafizi (University of Tirana), Wenbiao Han (SHAO), Luca Izzo (University of Copenhagen), Robert Jantzen (Villanova University), Vladimir Karas (Czech Academy of Sciences), Roy Kerr (University of Canterbury, New Zealand), Claus Laemmerzahl (ZARM, University of Bremen), Giovanni Lamanna (LAPP), Liang Li (ICRANet), Manuel Malheiro (Istituto Tecnológico de Aeronáutica –ITA), Grant Mathews (University of Notre Dame), Felix Mirabel (IAFE Argentina, CEA Saclay), Rahim Moradi (ICRANet), Ehud Nakar (Tel Aviv University), Tsvi Piran (Hebrew University of Jerusalem), Peter Predehl (MPE), Brian Punsly (ICRANet), Sang Pyo Kim (Gunsan National University), Hernando Quevedo (UNAM), Johann Rafelski (University of Arizona), José Rodríguez (UIS, ICRANet), Jorge Rueda (ICRANet Ferrara), Sara Saghafi (University of Mazandaran), Narek



Fig. 2: From left to right: Dr Agnès Rampal, assistant of the Mayor of Nice, Dr Xavier Latour, Vice-president of the Métropole Nice Côte d'Azur, Prof. Pascal Chardonnet and Prof. Jorge Rueda, visiting the ICRANet Seat at Villa Ratti during their visit on May 17, 2022.

Sahakyan (Director ICRANet Seat in Armenia), Stefano Scopel (Sogang University, CQeST), Soroush Shakeri (Isfahan University of Technology), Zhiqiang Shen (Director General SHAO), Costantino Sigismondi (ICRANet), Yousef Sobouti (IASBS), Rashid Sunyaev (IKI, Russian Academy of Sciences), Marco Tavani (INAF), Saken Toktarbay (Al-Farabi Kazakh University), Aldo Treves (University of Insubria), Gregory Vereshchagin (ICRANet), Yu Wang (ICRANet), Hyung Won Lee (Inje University), Shesheng Xue (ICRANet), Yefei Yuan (USTC), Alexander Zakharov (ITEP), Cesar Zen Vasconcellos (UFRGS), Bing Zhang (University of Nevada) and Yunlong Zheng (USTC)

Some of these speakers, participated in person and went to Villa Ratti in Nice to join Prof. Ruffini. Also Dr Agnès Rampal, assistant of the Mayor of Nice and Dr Xavier Latour, Vice-president of the Métropole Nice Côte d'Azur joined the meeting in person on May 17, the day of Prof. Ruffini's

birthday, in order to express him their sincere greetings, also on behalf of the Mayor of Nice, H.E. Christian Estrosi.

The rich program of the meeting was articulated in 4 main sessions, in order to accommodate all the different time zones and to facilitate the participation of many speakers from all over the world. The one organized every day in the early morning was mainly devoted to the connections with China, Korea and Iran. This was followed by a morning session, a lunch break one (which both saw the participation of many scientists from Europe) as well as by an afternoon one, mainly attended by scientist from North and South America.

The meeting webpage is available at the following link: <https://indico.icranet.org/event/3/>.

The recordings of the different sessions are now available on the ICRA Net YouTube channel, at the following link: https://www.youtube.com/playlist?list=PLr5RLbSWSonvwinAmihhTf675um9A_GqZ

MG16 Awards ceremony, May 17, 2022 (Nice, France)

On the occasion of the conference in celebration of Prof. Ruffini's 80th birthday, the official ceremony to deliver the MG16 Awards' statues in person to the Awardees has been also organized. The MG16 meeting took place from July 5 to 10, 2021 only online, in observance of the Covid-19 safety regulations which then imposed strict restrictions to travels and meetings' organization. The MG16 Awards have been therefore presented at ICRANet Seat in Villa Ratti in Nice on May 18, 2022 by Prof. Nathalie Deruelle, Prof. Jorge Rueda and Prof. Narek Sahakyan to Prof. Tsvi Piran (Hebrew University of Jerusalem), Prof. Peter Predehl (on behalf of Max Planck Institute for Extraterrestrial Physics - MPE) and Prof. Rashid Sunyaev (on behalf of Space Research Institute IKI of the Russian Academy of Sciences).



Fig. 3: Prof. Tsvi Piran receiving his MG16 Award at ICRANet Seat in Villa Ratti (Nice) on May 17, 2022, by Prof. Nathalie Deruelle (IHES).



Fig. 4: Prof. Peter Predehl receiving his MG16 Award at ICRANet Seat in Villa Ratti (Nice) on May 17, 2022, by Prof. Jorge Rueda (ICRANet).

At the end of the MG16 Awards ceremony, Prof. Piran and Prof. Sunyaev left their signatures on the wall of Villa Ratti, next to those of other eminent personalities (scientists, politicians, artists, ...) who visited the center.

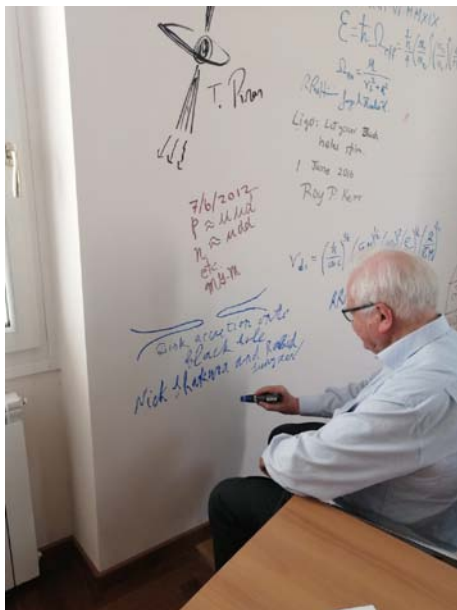


Fig. 5: Prof. Rashid Sunyaev, Russian Academy of Sciences, signing the wall of ICRANet Seat at Villa Ratti (Nice) on May 17, 2022.



Fig. 6: Prof. Tsvi Piran, Hebrew University of Jerusalem, signing the wall of ICRANet Seat at Villa Ratti (Nice) on May 17, 2022.

The 6th Bego Rencontre Summer School, July 4 – 14, 2022, Nice and online

The 6th Bego Rencontre Summer School has been held from July 4 to 14, 2022 as an hybrid event, both in person at the ICRANet Seat Villa Ratti in Nice (France) and online.

The School aimed to discuss recent developments in the theory and observations of gamma-ray bursts (GRBs), active galactic nuclei (AGNs), and dark matter (DM). Some relevant topics discussed about GRBs and AGNs have been:

- the energy extraction process from rotating black holes (BHs) in the inner engine of the high-energy (e.g. GeV) emission of long GRBs and AGNs. Special attention is given to inner engines comprising a Kerr BH immersed in a magnetic field and ionized plasma. Recent developments on the topic, especially the problem of field screening, electric discharge, radiation properties, black hole physics, magneto hydrodynamics, and the maximum electric charge allowed in the inner engines;
- the recent progress in GRB theory, for instance in the binary-driven hypernova (BdHN) model. This includes the physical explanation of the ultra relativistic prompt emission (UPE) phase in the MeV regime, the afterglow emission in the X-rays, optical, and radio wavelengths, and the GeV emission;
- the Supernova associated with GRBs and the role of the supernova explosion in the entire emission of a long GRB;
- GRBs at high-redshift and GRB-cosmology
- the emission of GRB cocoons (observations);
- the emission of M87* (theory and observations).



Some relevant topics discussed about dark matter have been:

- Fermionic and bosonic dark matter: microphysics;
- Fermionic and bosonic dark matter: macrophysics;
- Recent developments in the description of the Galactic center (Sgr A*) as a core of dark matter;
- Latest astrometric observations of stars orbiting Sgr A* and observational constraints on the nature of Sgr A*;
- Latest news on the baryonic content in galaxies;
- Strong gravitational lensing;
- Dark matter in early cosmology, cosmological simulations and dark matter halo formation.

More than 90 participants from 19 different countries joined the conference, and several lectures have been presented by Profs. Yerlan Aimuratov, Lorenzo Amati, Carlos Raul Arguelles, Davide Astesiano, Laura Becerra, Carlo Luciano Bianco, Stefano Bondani, Kunatay Boshkayev, Valentina Crespi, Mariateresa Crosta, Maria Giovanna Dainotti, Massimo Della Valle, Christopher Fryer, Daniele Gregoris, Luca Izzo, Petr Kotlarik, Liang Li, Francesco Longo, Wentao Luo, Nick Mavromatos, Massimo Meneghetti, Martin Mestre, Felix Mirabel, Rahim Moradi, Ehud Nakar, Florian Peissker, Vahe Petrosian, Tsvi Piran, Federico Re, Paola Re Fiorentin, José Rodríguez, Piero Rosati, Jorge Rueda, Narek Sahakyan, Costantino Sigismondi, Alessandro Spagna, Eleonora Troja, Gregory Vereshchagin, Matteo Viel, Yu Wang, Eli Waxman, Shesheng Xue, Rafael Yunis and Bing Zhang.

The meeting webpage is available at the following link: <https://indico.icranet.org/event/4/>

The recordings of the different sessions are now available on the ICRA Net YouTube channel, at the following link: <https://www.youtube.com/channel/UCU19scWRGvIliKBcN1QXCRQ>

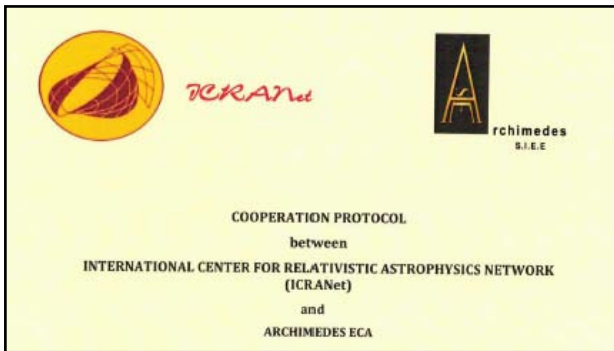
ICRANet's request to H.E. Rima Abdul Malak, Ministry of Culture of the Republic of France

On August 2, 2023 ICRANet sent a letter (PROT. 4504) to H.E. Rima Abdul Malak, Ministry of Culture of the Republic of France, in order to ask her to place under the protection of her ministry the historical archives as well as the frescoes dating from the 18th century and the signatures on the internal walls of ICRANet Seat at Villa Ratti. On September 8, 2023, ICRANet received a reply by Mr Tristan Frigo, head of Cabinet of the Ministry of Culture, informing us that the Ministry took note with attention of our correspondence asking him to transfer this material to the regional cultural affairs Directorate of Provence-Alpes-Côte d'Azur for its study. ICRANet has provided to inform about this request the Italian Court of Auditors on October 16 (letter PROT. 4528) as well as the Major of Nice Mr Christian Estrosi and the Deputy Mayor Ms Agnès Rampal on August 2 (letter PROT. 4502). On September 8 and October 2, ICRANet received a reply by Ms Xavier Latour on behalf of the Municipality of Nice, reiterating the need to protect such an exceptional artistic, scientific and historic heritage as well as its strong interest and commitment in the evolution of our ongoing action. They also thanked ICRANet for its strong commitment in constantly promoting scientific activities worldwide which contribute to the cultural growth of the city of Nice.

ICRANet and the Musée des Beaux-Arts Jules Chéret of Nice

On November 24, Ms Johanne Lindskog (Director of Musée des Beaux-Arts Jules Chéret of Nice and Head of Art Museums' coordination of Nice) contacted ICRANet and informed us that the Musée des Beaux-Arts Jules Chéret in Nice is organizing an exhibition from June to September 2024, about Berthe Morisot's (1841-1895) stays and works. Ms Lindskog, together with Ms Véronique Thuin de Chaudron (heritage Department of the Municipality of Nice) visited Villa Ratti on September 29, in order to discover and collect all this elements for the preparation of the exhibition. Berthe Morisot, a famous painter and model for Édouard Manet and Claude Monet, lived in Villa Ratti. The Director (Johanne Lindskog) is examining the possibility that the two paintings in the main room of Villa Ratti were the work of Manet and the sketches on the wall were drawn by Morisot. In order to verify this hypotheses, analyses will be carried on by the museum with the CICRP (Centre interdisciplinaire de recherche et de restauration du patrimoine), based in Marseille. As part of the exhibition, the Musée des Beaux-Arts and its scientific committee proposed 1) to draw up a partnership agreement ("*Convention de partenariat*") with ICRANet to be presented to the Municipal Council of Nice, in order to formalize the collaboration; 2) to plan visits to Villa Ratti for the general public; 3) to list ICRANet among the major organizations that have contributed to the exhibition. They plan to organize a campaign to take photo of the interior and exterior of Villa Ratti, to prepare a text about the villa in the exhibition catalogue, and to restore and present architectural elements of the villa. Ms Lindskog also informed ICRANet that several specialists in Roman archaeology at the Municipality of Nice's Heritage Department will visit Villa Ratti, in order assess the possible origin as a Roman villa. On November 21, ICRANet informed Mr Stéphane Morabito, Head of the heritage Department of the Municipality of Nice, about all these developments (letter PROT. 4541).

New cooperation protocol between ICRANet and Archimedes ECA, July 31, 2023



On July 31, 2023 ICRANet has signed a new Cooperation protocol with the association Archimedes ECA in France. The Cooperation Protocol has been signed by Prof. Joseph Kouneiher (President of Archimedes ECA) and by Prof. Remo Ruffini (Director of ICRANet).

This agreement will be valid for 5 years and the main joint activities to be developed under their framework include: the institutional exchange of graduate, post-graduate students, researchers and faculty members, the development of teaching

and/or research activities related to the areas of expertise and interest of both the organizations, the organization of symposia, seminars, conferences and short courses, the promotion and support of technical-scientific and cultural events and activities open to the public; the development of opportunities to form university teachers and researchers, the organization of training and recycling courses and activities as well as the developing of inter-institutional research areas associated to local graduate programs; the promotion of joint publications; the implementation of socially oriented activities through the academic extension; the exchange of information concerning teaching and research activities in both institutions as well as the applications to the international grant programs to promote joint research projects or implement mobility exchange programs.

For the text of the agreement: http://www.icranet.org/index.php?option=com_content&task=view&id=1499

The European Researchers' Night, September 29, 2023

As every year, ICRANet organized an event on the occasion of the European Researchers' Night, in order to create a nice occasion for discussion among citizens and researchers. This event attracted a lot of people, as every year, and offered visitors a unique opportunity to take part in science activities aiming to showcase both the fascination of research as a career and its significant societal impact. The event was held at ICRANet center in Pescara, in Nice and online, on Friday September 29, 2023, from 4 PM to 10 PM.

After the welcoming addresses by Prof. Ruffini, Director of ICRANet, the meeting started in the ICRANet Seat at Villa Ratti in Nice (France) - and broadcasted worldwide, where Prof. Ruffini presented his talk "*Black Holes in the Universe*", followed by the one by Prof. Joseph Kouneiher (President of Projct Archimedes E.C.A.) titled "*Les Rencontres de Villa Ratti*".

Soon after, the meeting was held in ICRANet center in Pescara (and broadcasted worldwide) and has been attended by the students from 2 classes of Galileo Galilei High School in Pescara, under the supervision of their tutor, Prof. Tiziana Pompa. Prof. Costantino Sigismondi (ICRANet collaborator and ITIS Galileo Ferraris, Rome) presented a talk titled "*Super-Moon, equinoctial tides and rogue waves*", followed by Dr Liang Li (ICRANet Faculty) presenting his talk "*The energy source of GRB 230916*" and by Prof. Gregory Vereshchagin (ICRANet Faculty) presenting his talk "*Electron-positron creation and Pauli blocking*".



Fig. 5: students from Galileo Galilei High School attending the European Researchers' Night event at ICRANet center in Pescara, September 29, 2023.

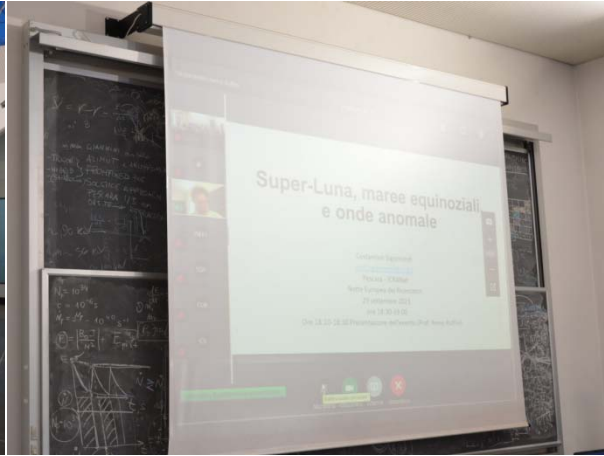


Fig. 6: Prof. Costantino Sigismondi presenting his online talk on the occasion of the European Researchers' Night event at ICRANet center in Pescara, September 29, 2023.



Fig. 7: Dr Liang Li presenting his talk on the occasion of the European Researchers' Night event at ICRANet center in Pescara, September 29, 2023.



Fig. 8: Prof. Gregory Vereshchagin presenting his talk on the occasion of the European Researchers' Night event at ICRANet center in Pescara, September 29, 2023.

Moreover, from 6 PM to 9 PM, ICRANet Hq center in Pescara was opened to the citizens for guided visits, where ICRANet Faculty members replied to visitors' questions.

At 9 PM, the meeting went on with the broadcast of the conference by Prof. Jorge A. Rueda Hernandez (ICRANet Faculty and University of Ferrara) titled "*Invisible Universe*" in the framework of the project "*Universo a km0*". This conference was held in Marano di Valpolicella (Italy) and has been followed by the observation of Saturn with the telescopes.

The concluding remarks have been presented by Prof. Ruffini, who thanked all the participants for joining this event.

For the program of the event: http://www.icranet.org/documents/program_european_researchers_night_2023.pdf

