Enclosure 5

ICRANet activities in Belarus

Cooperation Agreements with the Belarusian State University

On September 5, 2008 a Cooperation Agreement between ICRANet and the Belarusian State University (BSU) was signed by the director of ICRANet, prof. Remo Ruffini, and Rector of BSU, prof. Vasily Strazhev in Minsk, Belarus. This cooperation agreement has been renewed on August 26, 2013 by the director of ICRANet, prof. Remo Ruffini, and Rector of BSU, prof. Sergei Ablameyko.

Fig. 1 Opening of the Zeldovich meeting, organized by ICRANet and BSU. From left to right are the Rector of BSU, prof. Sergei Ablameyko, the director of ICRANet, prof. Remo Ruffini, and Dr. Gregory Vereshchagin. Minsk, 2009.

The goal of this agreement is to deepen the scientific and research cooperation, as well as to arrange bilateral seminars, make possible exchange of expertise, research and educational staff, publication of joint works. Within this agreement ICRANet has organized together with BSU the Zeldovich meeting in Minsk in 2009.

In addition, within this agreement two PhD students from BSU, Yuri Tsalkou and Aleksander Tarasenko, visited ICRANet. Two undergraduate students at the Department of Theoretical Physics and Astrophysics of BSU, Svetlana Vlasenko and Ivan Rybak, were supervised by Dr. Gregory Vereshchagin in their course works. New PhD student Nikolai Prokopenya has started his work under the supervision of Dr. Gregory Vereshchagin in 2017.

Belarusian State University

Agreement ICRANet - BSU

Rector
Andrei Karol

Signatories
Prof. Sergey V. Ablameyko
Prof. Alexander Gorbatsevich

Contact person
Prof. Alexander Gorbatsevich

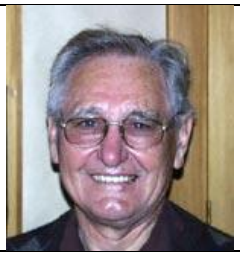
ONGOING AND PREVIOUS ACTIVITIES

Joint Activities

THE SUN, THE STAR, THE UNIVERSE AND GENERAL RELATIVITY The International Conference in Honor of Ya. B. Zeldovich 95th Anniversary

Belarusian State University, Minsk, Belarus, April 20-23, 2009

Visiting Professors to BSU

	**Dr. Alexei Aksenov** Participation in the: · *Zeldovich meeting*, 20-23 April 2009		**Prof. Hagen Kleinert** Participation in the: · *Zeldovich meeting*, 20-23 April 2009
	**Prof. Vladimir Belinski** Participation in the: · *Zeldovich meeting*, 20-23 April 2009		**Prof. Vladimir Popov** Participation in the: · *Zeldovich-100 Meeting*, 10-14 March 2014
	**Prof. Sandip Kumar Chakrabarti** Participation in the: · *Zeldovich meeting*, 20-23 April 2009		**Prof. Remo Ruffini - ICRANet Director**
	**Prof. Jaan Einasto** Participation in the: · *Zeldovich meeting*, 20-23 April 2009		**Prof. Gregory Vereshchagin**
	**Prof. Roy Patrick Kerr** Participation in the: · *Zeldovich meeting*, 20-23 April 2009		**Prof. She-Sheng Xue** Participation in the: · *Zeldovich meeting*, 20-23 April 2009

THE COOPERATION AGREEMENT
BETWEEN
INTERNATIONAL CENTER FOR RELATIVISTIC ASTROPHYSICS NETWORK
IN PESCARA, ITALY
AND THE BELARUSIAN STATE UNIVERSITY IN MINSK, BELARUS

International Center for Relativistic Astrophysics Network - ICRANet in Pescara (Italy) and the Belarusian State University (the Republic of Belarus), hereinafter referred to as 'Parties', having an intention to further deepen the scientific and research cooperation, have decided to sign the present Agreement.

Article 1

The participants in the implementation of the Cooperation Agreement from the Italian side will be:
ICRANet Coordinating Center in Pescara, Italy
and from the Belarusian side:
Belarusian State University in Minsk, Belarus

Article 2

The scientific and research cooperation will include:
1. Conducting joint research on scientific issues of interest to both Parties,
2. Arranging bilateral seminars,
3. Exchange of expertise between research and educational staff,
4. Publication of joint scientific works in international journals,
5. Exchange of publications, manuals and course books.

Article 3

1. The Parties will conduct the exchange of academic staff and students by means of formal letters of invitation. The invitations will be sent by the Director of ICRANet and the Rector of Belarusian State University.
2. The aim of the academic staff and students exchange is: participation in scientific conferences, seminars, symposiums as well as exchange of expertise, methodological training and joint discussions on up-to-date scientific issues of interest to both Parties.
3. By norm the exchange program will be done on reciprocal basis. All the travel expenses will be paid by the home institutions, while the local expenses will be paid by the receiving institutions. Motivated exceptions can be allowed.
4. Detailed conditions of realization of cooperation agreement and especially with regards to methods of financing, plan of exchanges of the academic staff and students of both parties will be specified in an Attachment to this Agreement.

Article 4

The present Agreement shall remain in force for five years, and will be automatically renovated for an equal period barring communication by either of the Parties, at least three months before the expiry of the Agreement, of its intention to withdraw the Agreement. Once signed, Agreement does not exclude a possibility of undertaking other cooperative activities which may be subject to annex to the present Agreement. Any changes in the content of the Agreement, as well as in the particular stages of joint activities, may only be performed in the written form with the approval of both Parties.

Article 5

The present Agreement is signed in two copies in English, and two copies in Russian, both texts are legally

valid. The two Parties receive one copy in either language.

Article 6

All disputes which might arise from this Agreement shall be resolved by the Director of ICRANet and Rector of the Belarusian State University, or by the persons authorized by them on the basis of the powers of attorney granted in writing in the process of the conciliation procedure.

Article 7

This Agreement shall be in force from the date of signing by both Parties

Agreement approved by:

International Center for Relativistic Astrophysics Network

Signature _____

Prof. Remo Ruffini

Belarusian State University

Signature _____

Prof. Sergey V. Ablameyko

Co-ordinators of the Co-operation

Signature _____

Dr. Gregory V. Vereshchagin

"26" August 2013

Signature _____

(Prof. Gorbatsevich A.K.)

"26" August 2013

Contact details of the Parties

International Center for Relativistic Astrophysics Network
P.le della Repubblica, 10, Pescara, Italy 65122
tel: +39-085-23054 / fax: +39-085-4219252
email: ruffini@icra.it

Belarusian State University
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Minsk, Belarus
tel./fax: +375-17-209-54-45
email: ablameyko@bsu.by

Cooperation Agreements with the National Academy of Sciences of Belarus

On September 6, 2013 a Cooperation Agreement between ICRANet and the National Academy of Sciences of Belarus (NASB) was signed by the director of ICRANet, prof. Remo Ruffini, and the Chief Scientific Secretary of NASB, prof. Sergei Kilin.

Within these agreement ICRANet has organized together with NASB the Zeldovich-100 meeting in Minsk in 2014. The 3rd Zeldovich meeting will be held in NASB in 2018.

In addition, a student from Belarus, Ivan Siutsou, was enrolled in the IRAP PhD program and successfully defended his thesis in 2013, receiving his PhD degree in relativistic astrophysics from all Universities participating in the program. He spend two years in Rio de Janeiro, Brazil, with a post-doc position within the ICRANet-CAPES program. Now he is researcher in ICRANet-Minsk.

ICRANet-Minsk center

On July 18, 2016 an Annex to the Cooperation Agreement between ICRANet and NASB was signed by the director of ICRANet, prof. Remo Ruffini, and the Chairman of NASB Presidium, prof. Vladimir Gusakov in Minsk, Belarus.

Fig. 2. Signature of the Annex to the Cooperation Agreement between ICRANet and NASB by the director of ICRANet, prof. Remo Ruffini, and Chairman of the Presidium of NASB, prof. Vladimir Gusakov. Minsk, 2016.

This document brought the collaboration between ICRANet and NASB to a new level and led to creation in Belarus of an ICRANet international academic center, ICRANet-Minsk. The ICRANet-Minsk center aims fostering scientific research in relativistic astrophysics, gravitation and cosmology in Belarus. The center is funded within the Belarusian state scientific program "Convergence", subprogram "Microworld and Universe" and it is located at the Stepanov Institute of Physics of NASB.

Fig. 3. Opening of ICRANet-Minsk center at the B.I. Stepanov Institute of Physics.

the department of theoretical physics and astrophysics of the Belarusian State University where has started his work under the supervision of Dr. Gregory Vereshchagin in 2017.

The scientific activities of ICRANet-Minsk center are coordinated by ICRANet and one of the ICRANet faculty members Dr. Gregory Vereshchagin is a frequent visitor at ICRANet-Minsk.

In 2017 ICRANet-Minsk center has

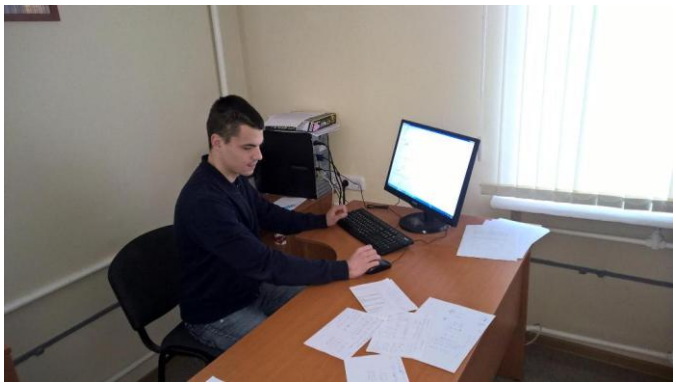


Fig. 5. Nikolai Prokopenya working at ICRANet-Minsk.

The staff of ICRANet-Minsk center includes the director, Academician Sergei Kilin and two researchers: Dr. Ivan Siutsou and Nikolai Prokopenya. Dr. Siutsou has graduated from the department of theoretical physics and astrophysics of the Belarusian State University, has received his PhD from the University of Rome Sapienza under the supervision of Dr. Gregory Vereshchagin in 2014 and spent two years as post-doc in CBPF in Rio de Janeiro, Brazil, within the ICRANet-CAPES program.

Nikolai Prokopenya is PhD student at

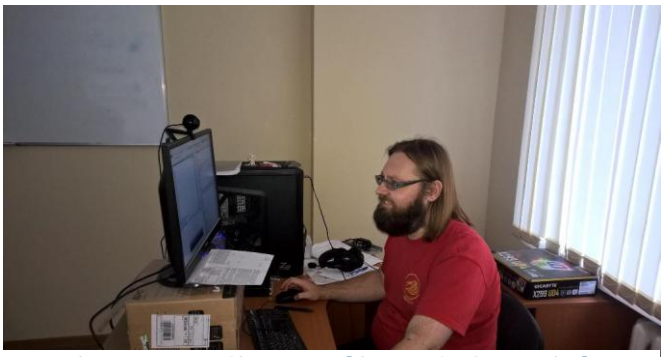


Fig. 4. Dr. Ivan Siutsou working at ICRANet-Minsk.

organized the first workshop on high energy astrophysics in Belarus. It was a parallel meeting to a larger symposium BelINP-2017 on nuclear physics at the National Academy of Sciences of Belarus. This workshop was an opportunity for young scientists working in relativistic astrophysics from European and Asian countries to exchange experience and to present results in their fields to the Belarusian scientists. This event was organized within the 2017 Year of Science, declared by the Presidential decree.

National Academy of Sciences of Belarus

ICRANet-NASB Agreement

Annex to Cooperation Agreement

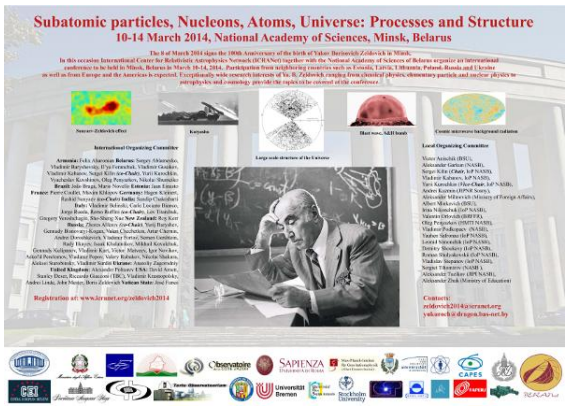
The Chairman of NASB Presidium
Vladimir G. GUSAKOV

Signatories of Agreement
Prof. Sergei Ya. KILIN
Prof. Yuri A. Kurochkin

Signatories of Annex
Prof. Vladimir G. GUSAKOV

Contact person
Prof. Sergei Ya. KILIN
Dr. Ivan Siutsou

ONGOING AND PREVIOUS ACTIVITIES

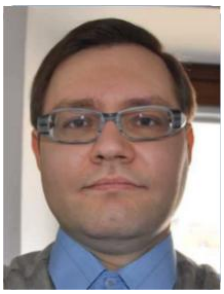


Zeldovich-100 Meeting
Minsk (Belarus)
March 11-14, 2014

ICRANet-Minsk workshop
Minsk (Belarus)
April 26-28, 2017

The Third Zeldovich meeting
Minsk (Belarus)
April 23-27, 2018

ICRANet-Minsk center



Dr. Ivan Siutsou
Current position: Researcher at ICRANet-Minsk
Previous positions: CAPES-ICRANEt post-doc at CBPF 2014-2016
Publication list, meetings, schools
Visiting researcher at ICRANet
From 2 to 31 May 2017
From 15 September to 15 October 2017 (supported by MOST program)

Nikolai Prokopenya
Current position: Researcher at ICRANet-Minsk
PhD student, Belarusian State University

Visiting Professors to NASB

Prof. Vladimir Belinski
Participation in the:
· *Zeldovich-100 Meeting*, 10-14 March 2014

Prof. Remo Ruffini - ICRANet Director

Prof. Sandip Kumar Chakrabarti
Participation in the:
· *Zeldovich-100 Meeting*, 10-14 March 2014

Prof. Alexei Starobinsky
Participation in the:
· *Zeldovich-100 Meeting*, 10-14 March 2014

Prof. Valeri Chechetkin
Participation in the:
· *Zeldovich-100 Meeting*, 10-14 March 2014

Prof. Lev Titarchuk
Participation in the:
· *Zeldovich-100 Meeting*, 10-14 March 2014

Dr. Marco Muccino
Participation in the:
· *Zeldovich-100 Meeting*, 10-14 March 2014

Prof. Gregory Vereshchagin

THE COOPERATION AGREEMENT
BETWEEN
INTERNATIONAL CENTER FOR RELATIVISTIC ASTROPHYSICS NETWORK
IN PESCARA, ITALY
AND THE NATIONAL ACADEMY OF SCIENCES OF BELARUS
IN MINSK, BELARUS

International Center for Relativistic Astrophysics Network - ICRANet in Pescara (Italy) and the National Academy of Sciences of Belarus – NASB in Minsk (the Republic of Belarus), hereinafter referred to as 'Parties', having an intention to further deepen the scientific and research cooperation, have decided to sign the present Agreement.

Article 1

The participants in the implementation of the Cooperation Agreement from the Italian side will be:
ICRANet Coordinating Center in Pescara, Italy
and from the Belarusian side:
the National Academy of Sciences of Belarus.

Article 2

In order to consent the best coordination of the activities, the two Parties will form a joint permanent Scientific Committee, composed of four members appointed, two on each side, within thirty days of the signing of this Agreement.

Article 3

The scientific and research cooperation will include:
1. Conducting joint research on scientific issues of interest to both Parties;
2. Arranging bilateral seminars;
3. Exchange of expertise between research and educational staff;
4. Publication of joint scientific works in international journals;
5. Exchange of publications, manuals and course books.

Article 4

1. The Parties will organize the exchange of academic staff and PhD students.
2. The aim of the academic staff and students exchange is: participation in scientific conferences, seminars, symposiums as well as exchange of expertise, methodological training and joint discussions on up-to-date scientific issues of interest to both Parties.

Article 5

The present Agreement shall remain in force for five years, and will be automatically renovated for an equal period barring communication by either of the Parties, at least three months before the expiry of the Agreement, of its intention to withdraw the Agreement. Once signed, Agreement does not exclude a possibility of undertaking other cooperative activities which may be subject to annex to the present Agreement. Any changes in the content of the Agreement, as well as in the particular stages of joint activities, may only be performed in the written form with the approval of both Parties.

Article 6

The present Agreement is signed in two copies, both in English and in Russian, the copies are equally valid.

Article 7

All disputes which might arise from this Agreement shall be resolved by the Parties.

Article 8

This Agreement shall be in force from the date of signing.

Agreement approved by:

ICRANet
International Center for
Relativistic Astrophysics Network

Signature _____

Director of ICRANet
Prof. Remo Ruffini

NASB
The National Academy of Sciences of Belarus

Signature _____

Chief Scientific Secretary of NASB
Prof. Sergei Ya. Kilin

Co-ordinators of the Co-operation

Signature _____

Dr. Gregory V. Vereshchagin

"6" September 2013

Signature _____

Prof. Yuri A. Kurochkin

"20" 08 2013

Contact details of the Parties

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email: nasb@presidium.bas-net.by

Annex to the Cooperation Agreement

between

International Center for Relativistic Astrophysics Network (Pescara, Italy)

and

National Academy of Science of Belarus (Minsk, Belarus)

Following the Cooperation Agreement between International Center for Relativistic Astrophysics Network (hereafter referred to as ICRANet) and National Academy of Science of Belarus (hereafter referred to as the NASB) signed on September 6, 2013 ICRANet, located in Pescara (Italy), Piazza della Repubblica n.10 (C. F. 91080720682), directed by Professor Remo Ruffini, and NASB, located in Minsk (Belarus), Independence Avenue 66, chaired by Academician Vladimir G. Gusakov, hereafter referred to as 'Parties', agree to create in Minsk an ICRANet international academic center (hereafter referred to as ICRANet-Minsk), to foster scientific research in relativistic astrophysics, gravitation and cosmology in Belarus and their integration into international activities in this field. Initially ICRANet-Minsk will be based in the B.S. Stepanov Institute of Physics of NASB (hereafter referred to as Institute of Physics).

Article 1

ICRANet-Minsk will operate in areas of relativistic astrophysics, gravitation and cosmology, in the theoretical and observational fields, in close collaboration with ICRANet. The activities of the ICRANet-Minsk will include organization of schools, courses, workshops, and conferences, training and research at post-graduate and post-doctoral levels in areas of competence of the ICRANet-Minsk, combined with an active visiting program.

Article 2

1. ICRANet will provide an international support for the operations of the ICRANet-Minsk.
2. ICRANet will extend the IRAP-PhD program to the interested research institutions of Belarus.
3. ICRANet will allow for the Belarusian Party to use the facilities and structures of the ICRANet Seats, in Rome (Italy), Pescara (Italy), Nice (France), Rio de Janeiro (Brazil), and Yerevan (Armenia), and from there to collaborate with scientific institutions of these and other countries.
4. ICRANet will help to build scientific data center in ICRANet-Minsk, providing computer facilities and data transfer from ground and space based observatories.

Article 3

1. NASB will provide financial support to ICRANet-Minsk, based on the State scientific programs and joint international projects, subject to the legislation of the Republic of Belarus.
2. Initially the rooms for ICRANet-Minsk will be provided by the Institute of Physics and the former will be considered as a department of the Institute, in accordance with the legislation of the Republic of Belarus.
3. The NASB will coordinate the scientific activities carried by ICRANet-Minsk and will foster cooperation between ICRANet-Minsk and Belarusian research institutions.
4. The annual programs of activity of ICRANet-Minsk will be approved by the governing bodies of NASB and ICRANet.

Article 4

Initially ICRANet-Minsk will recruit the Director, 2 scientists, as well as a system administrator and a secretary, following the national rules. The Director of ICRANet-Minsk will be approved by the corresponding Vice Chairman of NASB Presidium and the Director of ICRANet.

Article 5

The present Annex to the Cooperation Agreement shall be in force from the date of signing of both Parties.

Done in Minsk on 18 July 2016, in two original copies, each in Russian and English, all texts being equally authentic. In case of divergence of interpretation the English version shall prevail.

For the NASB

Vladimir G. Gusakov
Chairman of Presidium

For the ICRANet

Remo Ruffini
Director

Zeldovich Meetings

Two international meetings have been organized in Belarus by ICRANet and co-sponsored by ICRANet, NASB, BSU, and Central European Initiative (CEI).

Fig. 6. Participants of the First Zeldovich meeting in Minsk, 2009.

In 2009, within the celebration of the International Year of Astronomy, ICRANet organized the international conference, the First "Zeldovich meeting" in Minsk on April 20-23, 2009. Yakov Barosovich Zeldovich, the outstanding soviet scientist, was born in Minsk, Belarus, and the conference celebrated his 95th anniversary. The conference has created a stimulating environment for scientific exchange and contacts between scientists in the West, those coming from the great Russian school of Zeldovich, and local scientist from Belarus. Such internationally renowned scientists as Roy Kerr, Hagen Kleinert, Nikolay Shakura attended the conference and presented talks there. In addition, a memorable public lectures were given by Remo Ruffini, Gregory Vereshchagin and Vladimir Kurt, as well as a round table with participation of Zeldovich collaborators such as Vladimir Belinski, Valeri Chechetkin, Jaan Einasto, Vladimir Kurt, Vladimir Popov, and Nikolai Shakura, was organized. The proceeding of the meeting were published by the American Institute of Physics, in volume 1205 of AIP conference proceedings.

Fig. 7. Participants to the Second Zeldovich meeting in Minsk, 2014.

In 2014, the 100th anniversary of Yakov Barosovich Zeldovich was celebrated with many international conferences. The first international meeting in this series was the Second Zeldovich

meeting in Minsk. Many of the lecturers at the conference were the closest former collaborators of Ya. B. Zeldovich. Many young researchers took part in the meeting. In particular, the students from International Relativistic Astrophysics PhD program, including both CAPES-ICRANet and Erasmus Mundus program, participated in the conference and presented results of their scientific work. The conference was jointly organized by ICRANet and the National Academy of Sciences of Belarus. The opening address was given by Nobel Laureate prof. Zhores Ivanovich Alferov and by Prof. Remo Ruffini. There were more than 80 participants, nationals of Argentina, Armenia, Belarus, Brazil, China, Germany, India, Italy, Kazakhstan, Poland, Russia, and other countries. The conference covered many topics including cosmology, relativistic astrophysics, general relativity, elementary particle and nuclear physics, detonations and explosions.

Plenary papers are published in the leading Russian journal on astronomy and astrophysics, Astronomy Reports, vol. Volume 59, Issues 6 and 7. Regular contributions are published in special open access issue of Nonlinear Phenomena in Complex Systems, Vol. 17 No 4 (2014).

Fig. 8. Poster of the Third Zeldovich meeting to be held in Minsk in 2018.

The Third Zeldovich meeting will be held in Minsk on 23-27 April 2018. Participation from neighboring countries such as Estonia, Latvia, Lithuania, Poland, Russia and Ukraine as well as from Balkan countries, Eastern and Western Europe and the Americas is expected. Exceptionally wide research interests of Ya. B. Zeldovich ranging from chemical physics, elementary particle and nuclear physics to astrophysics and cosmology provide the topics to be covered at the conference: Early cosmology, large scale structure, cosmic microwave background; Neutron stars, black holes, gamma-ray bursts, supernovae, hypernovae; Ultra high energy particles; Gravitational waves.

THE SUN, THE STARS, THE UNIVERSE AND GENERAL RELATIVITY

INTERNATIONAL CONFERENCE IN HONOR OF YA. B. ZELDOVICH'S 95th ANNIVERSARY

Minsk, Belarus 20-23 April 2009

EDITORS

Remo Ruffini
ICRANet
Pescara, Italy

Gregory Vereshchagin
ICRANet
Pescara, Italy

SPONSORING ORGANIZATIONS

BSU – Belarusian State University
CEI – Central European Initiative
ICRANet – International Center of Relativistic Astrophysics
ICTP – International Center for Theoretical Physics

AIP American Institute of Physics

Melville, New York, 2010
AIP CONFERENCE PROCEEDINGS ▮ 1205

CONTENTS

Moments with Yakov Borisovich Zeldovich

Remo Ruffini

ICRANet, p.le della Repubblica, 10 - 65122 Pescara, Italy and
ICRA and University of Rome "Sapienza", p. Aldo Moro 5, I-00185, Rome, Italy and
ICRANet, University of Nice-Sophia Antipolis, 28 avenue de Valrose, 06103 Nice Cedex 2, France

Abstract. A recollection of special moments spent with Yakov Borisovich Zeldovich and with the scientists of Soviet Union and abroad.

The first impression upon meeting a person is the one which characterizes all subsequent interactions.

I met Yakov Borisovich Zeldovich for the first time in 1968 at the GR5 meeting in Tbilisi. I had known his name from his two classic papers on relativistic astrophysics in Physics Uspekhi coauthored with Igor Novikov [1, 2]. There had been a strong impulse to boycott the GR5 meeting due to the tense relations over human rights between the Soviet Union and the USA at that time. Finally a small group around Johnny Wheeler decided to participate. Among them were Arthur Komar, Bruce Partridge, Abe Taub and myself.

It was also my first visit to the Soviet Union. The entrance to Leningrad was already very special showing the difference in organization from our Western world. I will recall elsewhere some of the anecdotes. It was in the airplane to Tbilisi that a very particular experience occurred. The year 1968 was a time in which dissent was growing in the Soviet Union and the New York Times had just written an article on Andrei Sakharov and his reflections on peaceful coexistence and intellectual freedom. I boarded the plane for Tbilisi with Arthur Komar. We sat in the last row of a quite modern jet plane with open seats and shining windows, and we were commenting and laughing on all those stories we had heard in the West about windowless seats reserved for westerners on Soviet planes. When the plane was almost full the stewardess called the names of Arthur Komar and Remo Ruffini asked us to move to seats reserved for us in the front of the plane. We were delighted and we considered this an honor. Our two seats were in a line of three seats ... the only ones in the plane without a window. We were quite upset. In between us there was a third person who did not seem to speak English. So we started complaining about these methods and commenting appropriately also about Sakharov's recent opinions as presented in the New York Times and asking ourselves about the fate of Sakharov after his open statements. The plane was supposed to be a direct flight to Tbilisi of approximately seven hours. After approximately three hours of flight, without any announcement, the plane abruptly started to descend quite rapidly and landed in a town called Mineralnye Vody. After landing there was a lot of confusion, there were additional planes and finally it was disclosed that, as a common practice in the Soviet Union in the presence of bad weather, the plane had stopped and we would continue the flight the morning after. It was also announced that for foreigners there would be *a* room to sleep. Soon after I realized that there was only one room for all the foreigners! Since it was impossible to sleep I went back to the airport hall and I noticed this person who had been sitting between me and Komar on the plane to be alone in the hall and had found a chair. He was seating quietly waiting for the morning. I was attracted by his silence and his self-control. I approached him introducing myself: "Ruffini, Italy." To this his answer: "Sakharov, Soviet Union!" I still remember his serene smile. He was the first Soviet scientist I met on the way to our meeting in Tbilisi. The arrival in Tbilisi with Kumar and Sakharov was marked by the fortunate encounter with other monumental scientific figures.

We had the marvelous opportunity to meet some historical figures like Vladimir Fock, Iosif Shklovsky and Alexei Petrov and also Dmitry Ivanenko. It was amusing to see the ceremonial relations between Fock and Ivanenko. Fock, who as expected was always in the first row, had a conspicuous auditorial "apparat." Every time Ivanenko was taking the floor to speak, Fock was disconnecting his "apparat" with a very explicit gesture. In addition of course there was Yakov Borisovich surrounded by a large number of then young collaborators including Gennady Bisnovatyi-Kogan, Valery Chechetkin, Viktor Shvartsman, Nikolay Shakura, Alexei Starobinsky, Rashid Sunyaev, Sergei Shandarin and others. Zeldovich was encouraging all his students to attack in their scientific presentations almost like a boxer ring trainer.

The first day of the meeting Zeldovich invited me to lunch and asked me just at the beginning to speak about my research. I started to explain my work on self-gravitating bosons I had started in Rome and just recon-

CP1205, *The Sun, The Stars, The Universe and General Relativity*
edited by R. Ruffini and G. Vereshchagin

Figure 1. Solvay meeting of 1933. The series of photos from the Solvay meetings has been kindly given to ICRANet by Jacques Solvay, the descendant of Ernest Solvay in occasion of the assignment of the Marcel Grossman award to the Solvay foundation. Gamow is on the last row, perfectly symmetric with respect to other participants.

sidered after an interaction with the Pascual Jordan group in Hamburg. Indeed it was there that we realized that the previous treatment on Einstein-Klein-Gordon fields had a fatal error in the energy-momentum tensor leading to meaningless results. Later the correct work was completed by myself at Princeton and the published paper [3] became known as the paper in which the new concept of Boson Stars was introduced. After my first words Yakov Borisovich stopped me. I asked why. He stated "How long did you speak?" I answered "approximately forty seconds." To that he replied "If Landau would have been here he would have stopped you after twenty seconds." To that I immediately replied somewhat amused and self-confident "I do not think so, I am sure Landau would have said how new is this idea and he would have approved my considerations." He followed then my presentation of the new results and more polite and constructive discussions followed for the rest of the lunch. We also talked about George Gamow. Zeldovich recalled the animosity of all Soviet physicists towards Gamow since he did not return to Moscow after the famous Solvay meeting of 1933, see figure 1. By this action Gamow hampered the possibility for all Soviet physicists to travel abroad after that date. He recalled how he was motivated by a matter of pure confrontation against Gamow for some time. As soon as Gamow presented the theory of a hot universe he himself presented an alternative theory of a cold universe, initially at zero temperature [4]. The process of building up heavy elements was stopped in his theory by the presence of a degenerate sea neutrinos and only hydrogen would be born from an expanding Friedman universe. He stressed again, how building such a theory was motivated ideologically and politically. He recognized the crucial role of the Penzias and Wilson discovery of the cosmic microwave background radiation which disproved his 'political' theory and proved instead the validity of Gamow's theory[1]. He finally con-

[1] I have made recollection of all this in a recent publication in [5].

cluded "Yes: although Gamow made many mistakes he is one of the greatest Soviet scientists!" And then recalling the fundamental contributions Gamow made to the understanding of the DNA structure he asked: "How many Nobel prizes did Gamow receive? Two?" I answered: "None." And I was surprised how distant he was from our world.

Paradoxically the work of neutrinos in cosmology was later reproposed by Viktor Shvartsman [6] by considering the role of the many neutrino species and in general to the number of "difficult to observe particles with zero rest mass". In that paper Viktor, see figure 2 established his classical result of an upper limit to the number of neutrino species $N_\nu \leq 3$ assuming that the chemical potential of the electron neutrino be zero. This result signed a new

Figure 2. Picture of Viktor Shvartsman taken by myself in Moscow in 1975. Among the students of Zeldovich I was most impressed by Viktor. We reproduced one of his fundamental works in one of our book [22]. It was clear to all of us that his isolation in the Caucasian mountains, so far from the world of Moscow and the world of theoretical research he was so strongly aiming for, was a key factor in the tragic epilogue of his life.

beginning in the dark matter problem in the Universe. I myself worked later on the role of massive neutrinos in cosmology. I considered their fundamental role both in cosmological nucleosynthesis [7] and in formation of the structure in the Universe due to dark matter, leading to a fractal structure of the Universe [8].

But let us go back to Zeldovich: we became very good friends in the following years, and I regularly met him in Moscow. We had also the great pleasure to share so many common friends. In particular, I remember many interactions with Bruno Pontecorvo, see figure 3. In particular,

Figure 3. Picture taken by myself in an unplanned visit to an hospital in Moscow. On the left side Zeldovich, on the right side Pontecorvo.

with the participation of Bruno and Italian television we produced a documentary "Il caso neutrino" recovering the fundamental moments of the discovery of the neutrino all the way to the determination of their mass and their role in cosmology [9].

Since 1973 I had the great fortune to become a very close friend of Evgeny Lifshitz. He had just granted to me and John Wheeler the honor of being quoted in a named exercise in the volume "Theory of Fields" of his classic series with Landau. As we became more familiar with Evgeny, I developed a profound admiration of his intellectual abilities, of his understanding of physics and of his moral stature. Evgeny often recalled a series of anecdotes. One of the best aphorisms of Landau: "Astrophysicists often in error, never in doubt," and a different one related not only to astrophysicists but to physicists at large: "Due to the shortness of our lives we cannot afford the luxury to spend time on topics which are not promising successful new results". It was Evgeny who made me aware of some additional peculiarities in Zeldovich's character.

Lifshitz described that famous argument on the equation of state of neutron stars. Zeldovich first challenged the concept of the critical mass of the neutron star using an ad hoc model of supranuclear density interaction [10]. He had then purported the possibility of having an equation of state with the speed of sound equal to the speed of light, see [11]. Lifshitz then recalled that Landau did not want "to offend" the intelligence of colleague physicists. If an issue was very difficult and important he would explain this issue. In other cases he was not going to explain and would ask the person to answer himself. In the specific case of the extreme equation of state

Figure 4. The picture of Li-Zhi Fang with his wife, myself, Leopold Halpern, Volodia Belinski and his wife at the Rimini Meeting of CL of 1991.

Figure 5. Dinner at Lifshitz home in Moscow (circa 1985). At the center Evgeny Lifshitz and, on his left, Zeldovich and Vitaly Ginzburg with their wifes. Picture taken by my wife Anna Imponente.

Figure 6. Picture taken by myself.

$p = \rho$ of Zeldovich he simply told him "wrong!", and to Zeldovich's request "why?" he simply answered "you find out." This was before the tragic Landau car accident. After the accident Landau was no longer in any condition to give a proof of the statement, and Zeldovich was unable to give a proof either. One day at the restaurant of the Academy in Leninsky Prospect, Yakov Borisovich asked Evgeny in my presence "Why you did not insert my equation of state in the Landau and Lifshitz book?"

Figure 7. Ya. B. Zeldovich monument in Minsk in front of National Academy of Sciences of Belarus.

Figure 8. The picture of George Coyne and myself greeting John Paul II.

To this Lifshitz replied "Did you solve the problem assigned by Landau?", and to that Zeldovich said "No.", and to that Lifshitz's answer was "Then I do not quote the result in the Landau and Lifshitz book."

Figure 9. I look with terror Zeldovich approaching the Pope John Paul II clearly with an unidentified object disguised under his jacket.

Figure 10. Zeldovich presenting his books to Pope John Paul II.

Figure 11. Zeldovich after the presentation of his books. To the offering of the books the Pope said "Thanks" and Zeldovich very loudly shouted "Not just 'thanks' ! These are fifty years of my work!" The Pope kept Zeldovich's collected papers under his arm during the entire rest of the audience.

My visit to Moscow was specially joyful due to the interactions with so many extraordinary scientists like Aleksandr Prokhorov, Isaac Khalatnikov, Pavel Cherenkov, Vitaly Ginzburg and others kindly invited to lunch with me in the Italian Embassy by the then Italian ambassador Sergio Romano and his predecessors. Encounter with Khalatnikov was especially productive. Khalat was the founder of the Landau Institute. However, among the others faculty members was Vladimir Belinski. The friendship with Lifshitz and Khalat soon extended to Volodia. So much so, that it transfered to Italy with his wife Elena, see figure 4, and became Italian citizen and one of the first faculty members of the newly founded ICRANet since 2005. Also extremely pleasant were the meetings at Yevgeny's home with friends and their wives, see figures 5 and 6. One very special occasion took place in Moscow. One day I was visiting Yakov Borisovich in his Institute. He said "Come and see a present I received from my friends in Minsk, where I was born." And he showed me a bronze statue of him-

Figure 12. Picture of Wheeler, Christodoulou and myself in Fine Hall in Princeton in the former office of Albert Einstein. The picture is taken in front of the fireplace where Einstein wrote with charcle, and now is engraved in gothic scripture in the marble, the famous sentence "Raffiniert ist der HerrGott, aber boshaft ist er nicht".

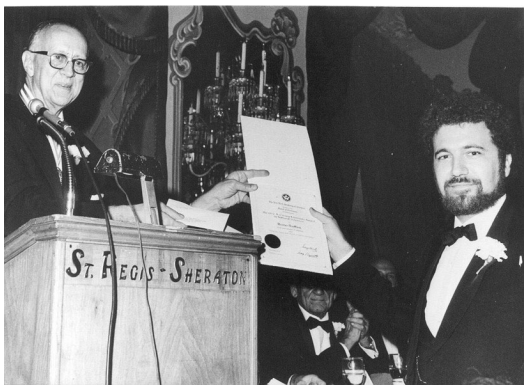

Figure 13. Receiving the Cressy Morrison Award of the New York Academy of Sciences in 1972.

Figure 14. Solvay meeting of 1973.

self. I told him "Congratulations, I can finally say that I have a friend with the bronze face!" using the Italian meaning "faccia di bronzo" which are not very complementary words addressed to someone who is insensitive to problems. Full of these memories I was delighted to see in the city of Minsk, now reconstructed and rebuilt, in the serenity of the spring his statue in form of a monument in front of the Academy of Sciences, see figure 7.

In 1985 I decided to create an international consortium dedicated to the field of relativistic astrophysics, the International Center for Relativistic Astrophysics (ICRA). This consortium relates the University of Rome "La Sapienza" to the University of Stanford, and the Space Telescope Institute at the USA, the University of Science and Technology in Hofei, China, the Specola Vaticana and the ICTP. It was coherently founded by George Coyne, Li-Zhi Fang, Francis Everitt, Riccardo Giacconi, Abdus Salam, and myself, see figure 8.

The most unique occasion with Zeldovich came in 1986 in Rome during the visit of the four delegations of the space research program of Europe, Japan, Soviet Union and the USA in occasion of the Halley comet mission. ICRA organized the meeting at "La Sapienza" and the Vatican. It was the first time Zeldovich could come to the West as a member of a very exceptional delegation created by Roald Sagdeev for this epochal meeting. There are many anecdotes with Zeldovich being shocked by a number of cars in the Italian streets and proposing to help himself with one since in his opinion it would be impossible to trace back the real owner. I did successfully convince him no to proceed in such an idea. Entering in the "Sala Regia" in the Vatican he attempted to seat in the first row and to my request to take his assigned seat in the 21st row seeing all the remaining ones still empty he said "Nobody will notice me in the first row." I insisted that he should come back to the seat assigned to him by the Vatican ceremonial office. After few minutes he realized that the first rows were occupied on one side by the cardinals, the bishops and personnel

of the Vatican, and on the other side by the ambassadors to the Vatican all in their sumptuous vests. Certainly the presence of Zeldovich in the first row would have been quite obvious and unjustifiable! But the surprises were not yet over. I was supposed to introduce him to the Pope during the audience with the members of the delegations. And I saw Zeldovich approaching with a clearly large object under his jacket. I was terrified, see figure 9.

Suddenly Zeldovich opened the jacket in front of John Paul II, extracted two books and put them into the hands of the Pope John Paul II, see figure 10. His holiness said "Thank you very much, professor Zeldovich", and to this with a very loud voice which penetrated the entire "Sala Regia" Zeldovich forcefully replied "Not just 'thanks'! These are fifty years of my work!" There was a great laugh from everybody as they relaxed. Later on John Paul II recalled that this was one of joyful audiences he had ever had. And he kept the two large red volumes over his white robe during the entire audience, see figure 11.

Finally I would like to remark that a great scientist can even make a great discovery when he participates in some irrational actions. In the late fifties when the race to the Moon between the US and the Soviet Union was on someone proposed to show the great technical ability in the space vehicles and in the nuclear technology proposing to the Soviet superiority to explode at a fixed time an atomic bomb on the Moon[2]. This awful project fortunately was never implemented. Nevertheless it was one of the motivations to develop a highly secret mission from the United States in order to test the no proliferation agreement: the Vela satellites. These satellites were conceived to patrol all the region around the Earth and the Moon for possible nuclear explosions! Everybody knows today that this led to the discovery of gamma-ray bursts and we were very honored and pleased to announce their discovery at the 1972 AAAS meeting in San Francisco which was chaired by Herb Gursky and myself [14].

In 1987 I visited Zeldovich in Moscow for the last time. There was a meeting at the Academy of Sciences on cosmology. While he went to deliver his talk he asked me to keep his jacket with the three gold stars and red stripes of the Hero of Socialist Labor. He was among the few people to have three such decorations. They told me that even Stalin had only one such "star". I was not surprised. By that time I had become aware of his many contributions in ignition, combustion, explosions as well as of his work with Yulii Khariton and Igor Kurchatov on the atomic bomb. Slowly but inevitable I became also aware of the role of John Wheeler in the American H-bomb project. Of course it was clear they had done an

[2] Different versions exist of this story. Some presented direct involvement of Zeldovich [12], some show Zeldovich as an opponent of this idea on technical grounds [13].

Figure 15. Jonhy enjoying the pictures of Jacopo in 1999.

Figure 16. Picture of Ginette and Johny Wheeler with Anna in High Island with Ginette holding one of her preferred Gucci scarf.

Figure 17. Picture taken in my office at "La Sapienza" of Vladimir Popov surrounded by Gregory Vereshchagin, She-Sheng Xue and myself in 2006.

Figure 18. The picture of the participants of the Varenna summer school. In the second row Anthony Hewish (Nobel Prize, 1974), Joe Taylor (Nobel Prize, 1993), Subrahmanyan Chandrasekhar (Nobel Prize, 1983) and Riccardo Giacconi (Nobel Prize, 2002).

enormous work in the physics of the bomb and also it was evident that they had learned one of the greatest amount of physics reachable at the time.

When it came to the work on Relativistic Astrophysics I was surprised to see that this vast quantity of knowledge in physics they had acquired in making the bombs did not help as much as one would have expected. They were somewhat overshooting and did not catch the beauty, the different and possibly more profound physical scientific complexity, and also the conceptual simplicity of the new phenomena. In the case of Wheeler the interactions with him during the first years in Princeton had be tremendously intense. At times we were working 13 hours a day. We wrote that celebrated article for Phyiscs Today [17], recently reprinted [18], in which we were presenting for the first time a Black Hole as a physical object and not just as a mathematical solutions. Such an object was indeed interacting actively with the rest of the Universe by a vast amount of energy, in principle extractable: the rotational and the electromagnetic energy. These works were received an exponential growth with the coming to Princeton of Demetrios Christodoulou from Greece at the age of 16. When he started his thesis of PhD at the age of 18 Demetrios approached the problem suggested by Wheeler of the collapse of a scalar field forming a black hole which he finally solved in 2009 [19]. A second part of his thesis was developed under my guidance [5] which has led to the general mass formula of the black hole [24], see figure 12. Interestingly precisely these concepts have made later the Black Holes through their "Blackholic energy" the explanation of Gamma Ray Bursts [25]: the largest instantaneous energy sources in the Universe second only to the Big Bang [5, 20, 21]. In collaboration with Rees we also wrote a book giving guidelines for the study of Black Holes, Gravitational Waves and Cosmology [22]. The field of Relativistic Astrophysics started to grow exponentially after the introduction of X Ray Astronomy by Riccardo Giacconi and his group [23]. Paradoxically Wheeler interest started to depart from these topics and drifted toward a (possibly too) vast field of exploring the world of mathematics in the quest for better expressing the laws of physics, see also my recollections in [5]. It was that time in which I proposed the paradigm for the first identification of a Black Hole in our Galaxy [26], see figure 13.

A profound separation of scientific interests had already occurred in those days at the Les Houches summer school: the first one solely dedicated to black holes [27]. After that event I dedicated myself to the study of Black Holes larger than 3.2 solar masses. While S. Hawking and his group directed all the attention to mini black holes (see e.g. [28]). The field of matter accretion on a Black Hole was not developed in the West and became dominated by the Russian (see Titarchuk contribution to

this volume) and Indian schools (see Chakrabarti contribution to this volume). In the case of Wheeler a different point of view on the role of European scientists in the United States of America emerged, and a separation of our scientific interest became manifest in the 1973 Solvay meeting (see figure 14), which was followed by my return to Europe. These differences did not affect in any way the deep friendship between us extended to our families, see figures 15 and 16.

In the case of Zeldovich some similar event happened. I was trying to make him appreciate the beauty of the work I was developing with an American hero of Relativistic Astrophysics, Jim Wilson, himself a distinguished participants of the American Bomb projects. The work on the relativistic magnetohydrodynamics effect around Black Holes have today reached the greatest interest for microquasars and active galactic nuclei explanations [29]. To that he was answering with his interests toward the possible radiation of a rotating sphere due to quantum effects. To me that work did nor appear so promising in view of the intrinsic stability imposed by quantum effects on a rotating system.

Thinking over my scientific discussions with Zeldovich I was especially admiring his work with Vladimir Popov on heavy nuclei, as expressed in our recent report [21]. On this topic see also Popov's contribution in this book. This topic has become central to our current research, see figure 17.

In all my discussions with Zeldovich through the seventies I was particularly eager to illustrate to him my work on the black hole identification and to observe his feedback. Much of these works, following the Solvay meeting, were summarized in our celebrated Varenna summer school, see figure 18. This basic work then appeared in the book [15] which is currently being reprinted [16]. That epochal meeting in the scientific content was followed until today by three Nobel Prize winners among the lecturers as S. Chandrasekhar (1983), J. Taylor (1993), and R. Giacconi (2002), see figure 19.

But let us return after this digression to my last meeting with Zeldovich. While he was speaking Sakharov entered the room and sat in the first row near me. He had just been permitted to return to Moscow after the Gorky exile. I had just been helping at the University of Rome to attribute to him a *laurea honoris causa - in absenzia*. I looked at him closely: the face had changed from the Tbilisi days, his smile was gone and his gentle aspect had been modified. Even the structure of the face was somewhat more tense with a more prominent jaw. I gave my hand to him: "Ruffini, Italy" and his immediate answer recalling a serene expression resembling the old days "Sakharov, Soviet Union!"

In June 1988 on the hundredth anniversary of the birth of Alexander Alexandrovich Friedman we went to Leningrad with Werner Israel and a few other relativists. It was a very emotional occasion to find the tomb of Friedman and put some flowers on it. Yakov Borisovich Zeldovich had died on December 2, 1987. This was the occasion of a trip by night sleeping train between Moscow and Leningrad with my wife Anna.

Figure 19. Picture of Riccardo Giacconi receiving the Nobel Prize.

Figure 20. Television broadcast made by Igor Novikov, Andrei Sakharov and myself in the celebration of Alexander Alexandrovich Friedman's 100th Anniversary, Leningrad, 1988.

The next compartment on that train was occupied by Andrei Sakharov and Elena Bonner. The day after a memorable broadcast from the television was made by Igor Novikov, Andrei Sakharov and myself in the celebration of Alexander Alexandrovich Friedman, see figure 20.

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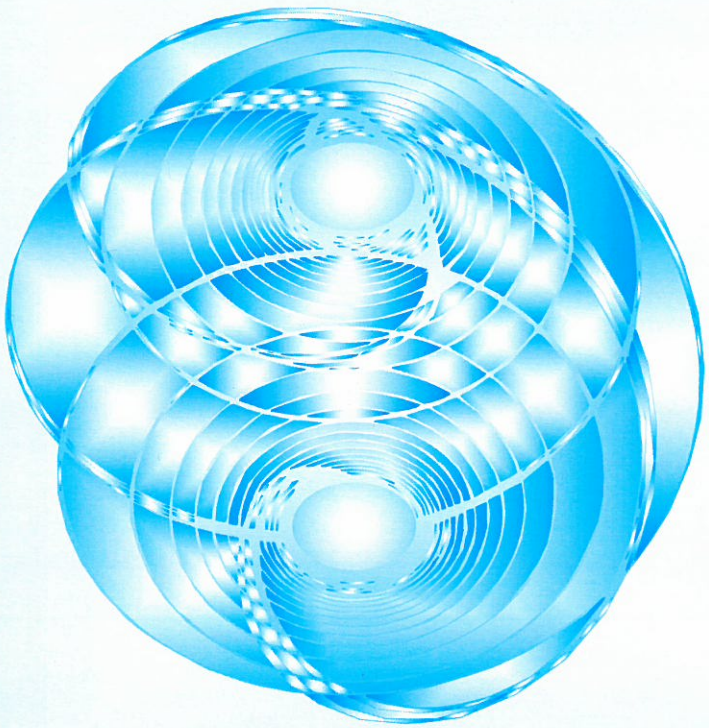
NONLINEAR PHENOMENA IN COMPLEX SYSTEMS.

НЕЛИНЕЙНЫЕ ЯВЛЕНИЯ В СЛОЖНЫХ СИСТЕМАХ

RECOGNIZED BY THE EUROPEAN PHYSICAL SOCIETY



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NONLINEAR PHENOMENA IN COMPLEX SYSTEMS.
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Vol. 17, no. 4, pp. 340 – 470, 2014

JOURNAL SPECIAL ISSUE – PROCEEDINGS OF THE INTERNATIONAL CONFERENCE IN HONOR OF YA. B. ZELDOVICH 100TH ANNIVERSARY

"Subatomic particles, Nucleons, Atoms, Universe: Processes and Structure"

Discussion on accession of the Republic of Belarus to ICRANet

In March 2014 prof. Remo Ruffini had a meeting with the First Deputy Minister of Foreign Affairs, Mr Aleksandr Mikhnevich. They discussed successful joint activities, including two international conferences organized by ICRANet in Belarus, as well as organization of ICRANet center in Belarus, and possible entrance of Belarus to ICRANet.

Fig. 9. Meeting of Director of ICRANet, prof. Remo Ruffini and the Chairman of the Standing Committee for Foreign Affairs and National Security prof. Sergei Rakhmanov, 27 April 2017.

In August 2015 Dr. Gregory Vereshchagin had a meeting with the chairman of the State Committee on Science and Technology of the Republic of Belarus, Dr. Alexander Shumilin and discussed with him, on behalf of Director of ICRANet, organization of ICRANet center in Belarus and possible accession of Belarus to ICRANet.

In April 2017 prof. Remo Ruffini had a meeting with the Chairman of the Standing Committee for Foreign Affairs and National Security prof. Sergei Rakhmanov and discussed possible accession of Belarus to ICRANet.

Following these meetings the National Academy of Sciences has initiated the request to the Council of Ministers of the Republic of Belarus to start the procedure towards the accession of the Republic of Belarus to ICRANet.

Collaborations in Relativistic Astrophysics with China

The exchange in the field of astrophysics between Italy and China has a long history dating back to the transfer to China of a telescope by Lì Mădòu (Matteo Ricci) and the translation in Chinese of the Euclid's books by his student Xu Guangqi in the 16th century.

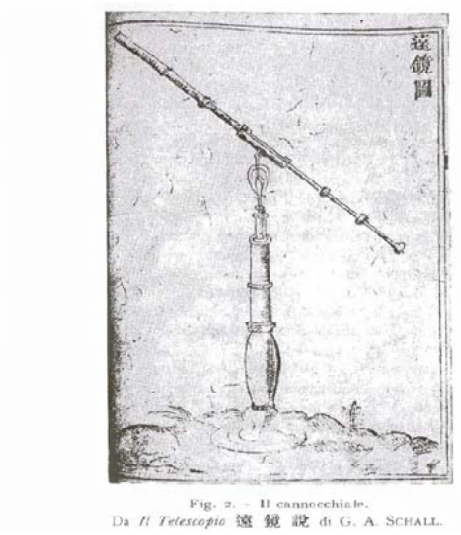
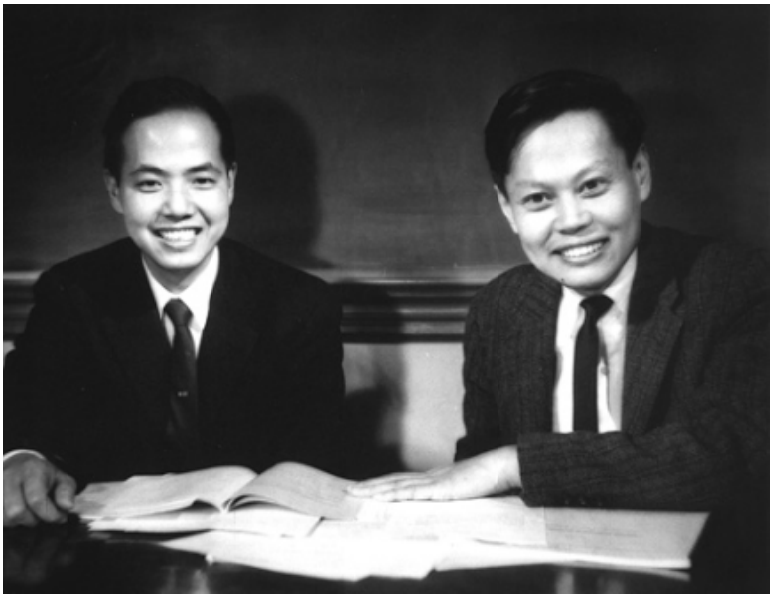


Fig. 2. - Il cannocchiale.
Da *Il Telescopio* 遠 鏡 說 di G. A. SCHALL.

In recent years the modern contributions in the field of Astrophysics has been carried forward by professor T.D. Lee and in the fields of Relativistic Field Theories and Einstein General Relativity Theory by professor C.N. Yang, both Nobel Laureates in 1956. They both were Chinese students of Enrico Fermi in 1940s.



Following the first visit to China of professor Remo Ruffini in 1978, by invitation of the Chinese Academy of Sciences (CAS) a vast number of collaborations have started in the field of Relativistic Astrophysics, following the classic article "Introducing the Black Hole" by Remo Ruffini and John Archibald Wheeler (Physics Today, January 1971, pages 30-41) in the Institute Advance Study (IAS) at Princeton.

The first visit of prof Remo Ruffini to China, Beijing and Tsinghua Universities, National Observatories of CAS

Based on a series of lectures delivered in China, Li Zhi Fang and Remo Ruffini wrote book "Basic Concepts of Relativistic Astrophysics" (World Scientific, 1983, Chinese version, Shanghai Scientific publisher 1981).

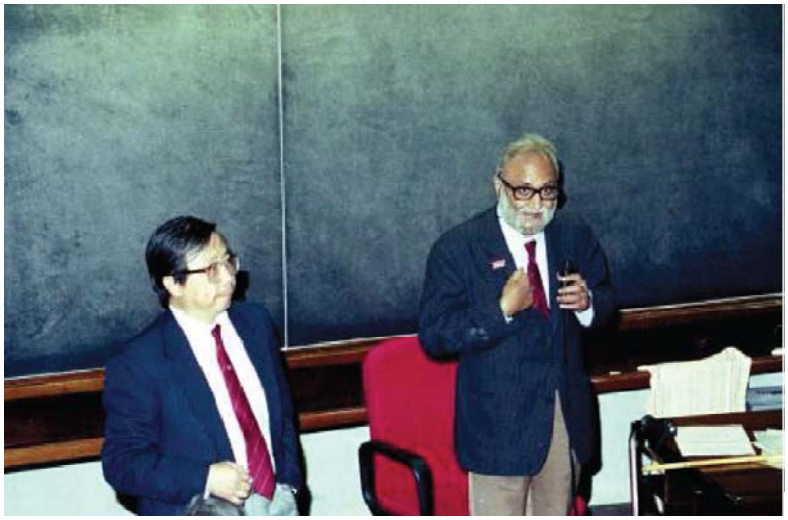
This fundamental and didactical book has been worldwide used by undergraduate and graduate students for many generations.

In 1982, with Nobel Laureate and president of the International center of theoretical physics (ICTP) prof. Abdus Salam and the president of China Association for Science and Technology (CAST) prof. Zhou Peiyuan, prof. Remo Ruffini organized

3rd Marcel Grossmann Meeting, Shanghai (China), 1982. http://www.icranet.org/MGMeetings
Proceedings was edited by prof Hu Ning of Beijing University and Institute of theoretical physics (ITP), Chinese Academy Science (CAS). This was the first international scientific meeting participated by important western scientists in China after the cultural revolution, greatly impacting on not only Chinese and western scientific communities, but also the government policy "opening door to the world" advocated by Premier Deng Xiao Ping in that time.

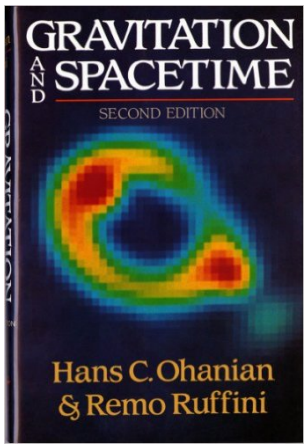
Premier Zhou En Lei and prof. Abdus Salam in 1965

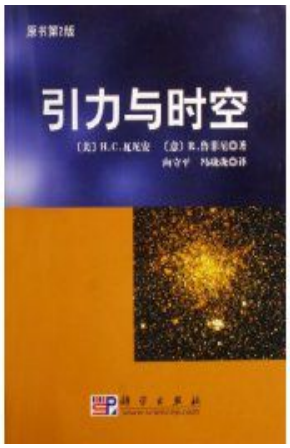
Since then, the collaboration between China and Italy grew exponentially and the attention was turned to foster a collaboration also with the US and to strengthen relations between China and the US, ICTP and the Vatican Observatory. Together in 1985 we created the International Center for Relativistic Astrophysics (ICRA) at
the University of Rome "la Sapienza" with founding members Riccardo Giacconi
(Baltimore Space Telescope Institute), Abdus Salam (ICTP and TWAS), George Coyne (Vatican Observatory), Remo Ruffini (University of Rome, la Sapienza"), and Fang Lizhi (University of Science and Technology in Hefei, USTC). ICRA has been the foundation for many successful developments and training Chinese scientists in Relativistic Astrophysics.



ICRA members: Nobel Laureates Riccardo Giacconi and Abdus Salam, prof Li Zhi Fang

A large number of Chinese students have received their PhD in Italy, a large number of Chinese researches and post-docs have visited ICRA, and then been recommended to visit other western Institutions, among them Jing Yi-Peng, Li Miao, Feng Long-Long, Gao Jian-Gong, Xian Shuo-Ping and others, they became leading professors in important Institutions after their return to China. A large number of joint publications have appeared in international journals and many advanced scientific books have been published in Chinese, English and Italian. As example, the advanced monograph on the Einstein General relativity, "Gravitation and Spacetime" by Hans C. Ohanian and Remo Ruffini (W.W. Norton & Company, 1994) was translated into Chinese (Chinese Scientific publisher, 2006) by Prof. Ruffini former students Xiang Shou-Ping and Feng Long-Long, and now is an important referenced book in Chinese and Western Universities.

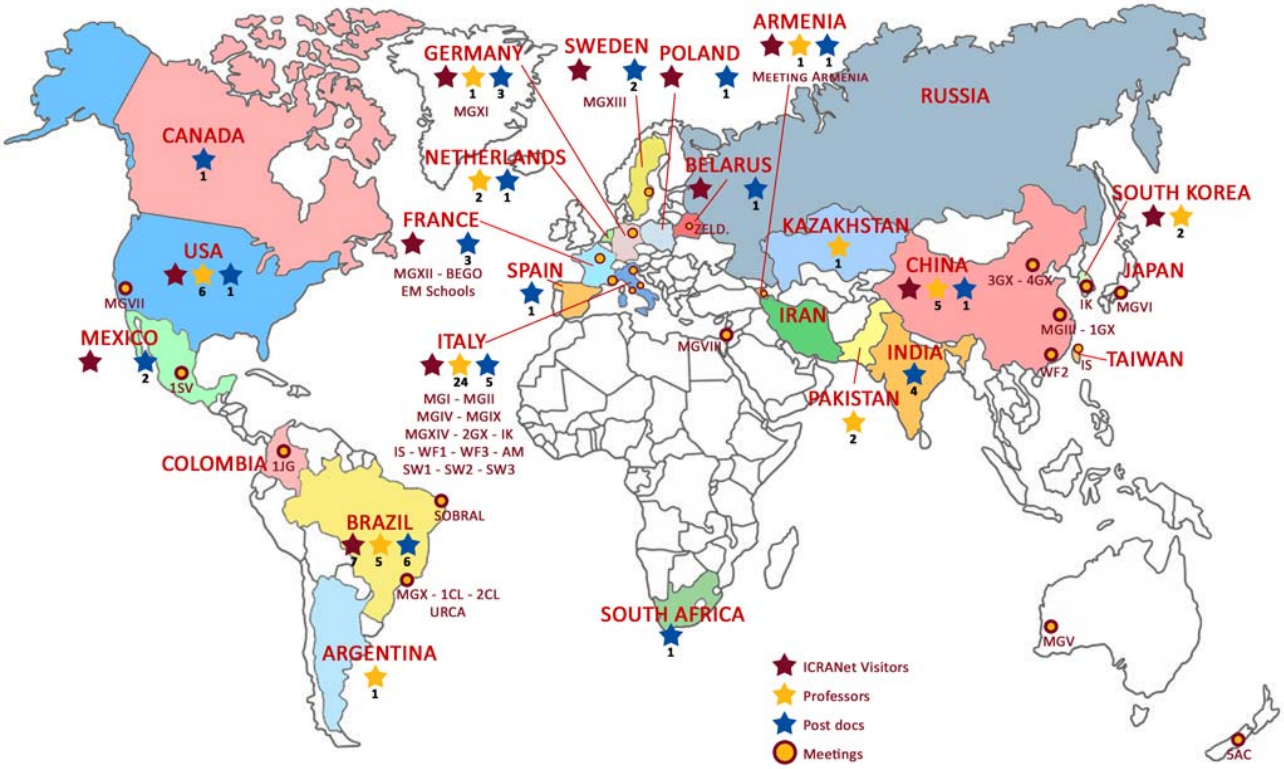




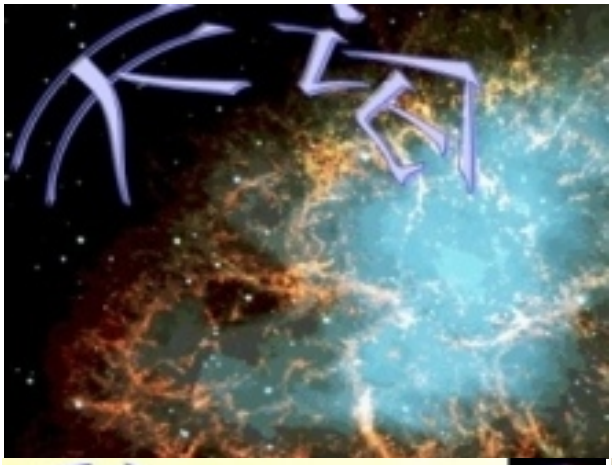
On March 19, 2003, the Establishment and the Statute of ICRANet were signed and recognized in the same year by the Republic of Armenia and the Vatican State. ICRANet has been created in 2005 by a law of the Italian Government, ratified by the Italian Parliament and signed by the President of the Italian Republic Carlo Azeglio Ciampi on February 10, 2005. The Republic of Armenia, Italy, the Vatican State, ICRA, the University of Arizona and the Stanford University are the founding members.

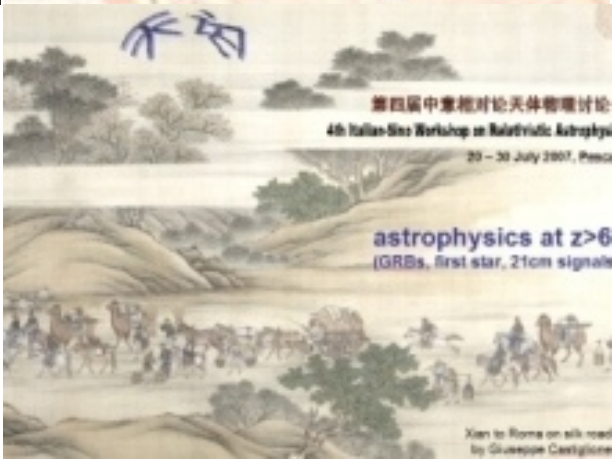
On September 12, 2005 the Steering Committee was established and had its first meeting. Remo Ruffini and Fang Li-Zhi were appointed respectively Director and Chairman of the Steering Committee. On December 19, 2006 the Scientific Committee was established and had its first meeting in Washington DC. prof. Riccardo Giacconi was appointed Chairman and prof. John Mester (Stanford University) Co-Chairman.

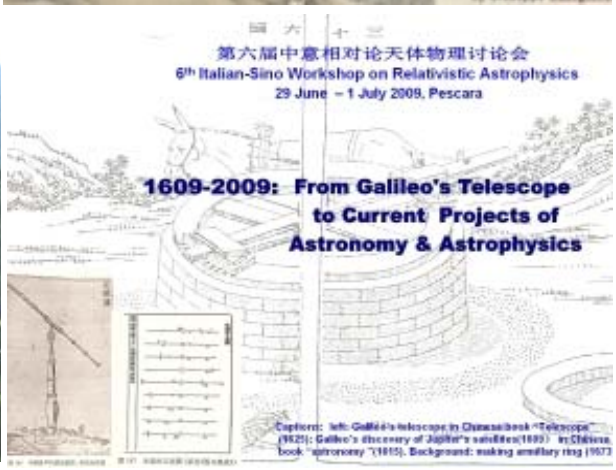
On September 21, 2005 the Director of ICRANet signed with the Ambassador of Brazil Dante Coelho De Lima the adhesion of the Federative Republic of Brazil to ICRANet. The entrance of Brazil, requested by the President of Brazil Luiz Ignácio Lula Da Silva has been unanimously ratified by the Brazilian Parliament. On August 12, 2011 the President of Brazil Dilma Rousseff signed the entrance of Brazil in ICRANet. This map illustratively indicates ICRANet scientific activities and connections, including international scientific agreements, conferences, workshops, adjunct professors and exchanged visitors of professors, postdoctors and students in countries and scientific institutions worldwide, see here.



From 2004 to 2008, in the coordinate center of ICRANet at Pescara, Italy, a series of six Italian-Sino workshops on cosmology and relativistic astrophysics have been established by Profs. Remo Ruffini and Li Zhi Fang. These workshops were participated by both western, Chinese, oversee Chinese researches and Ph.D. students in the frontier of research of Relativistic Astrophysics. Chinese participants were hosted by ICRANet and supported by Chinese research fund for their travels. They all are nowadays key elements of Chinese international scientific projects in cooperation with western scientific communities in many active research fields. It should be mentioned that one of these meeting was in Nice University, France, another hosted and supported by Chinese Academia Sinica and universities in Taiwan.
http://www.icranet.org/IS-Workshops

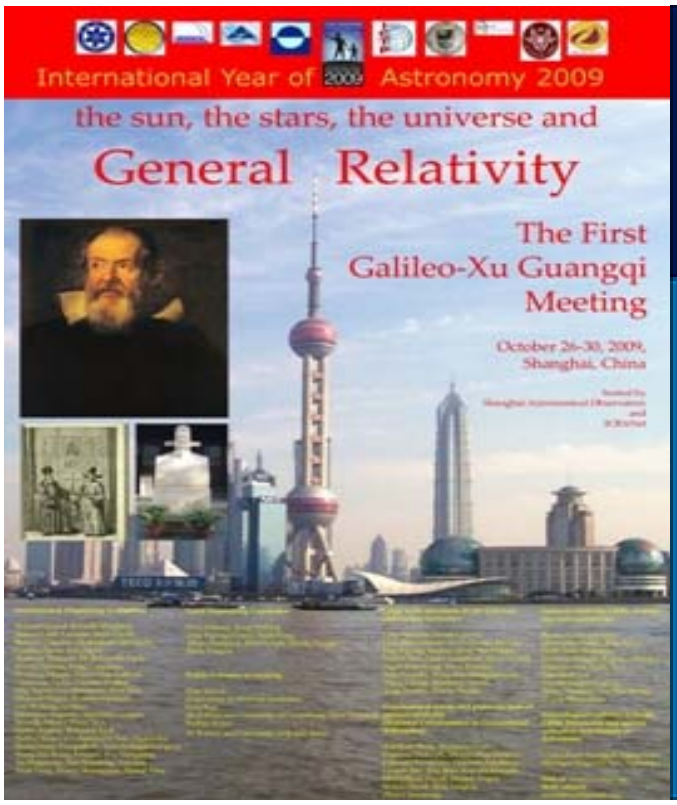


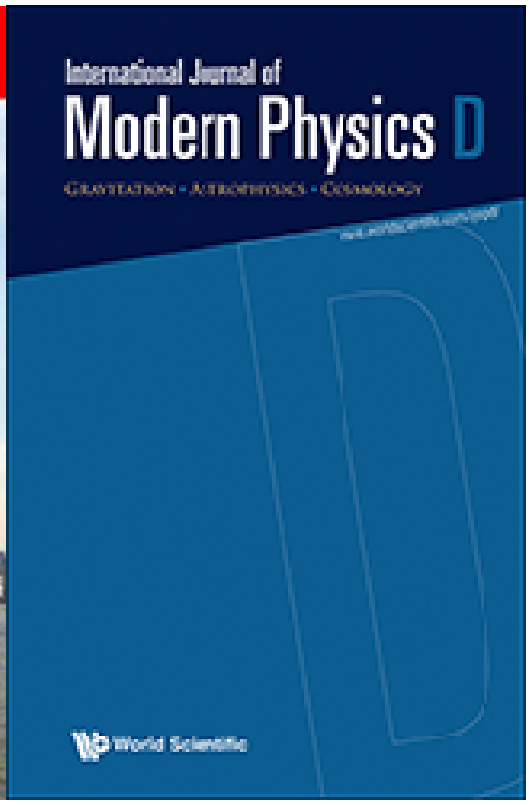




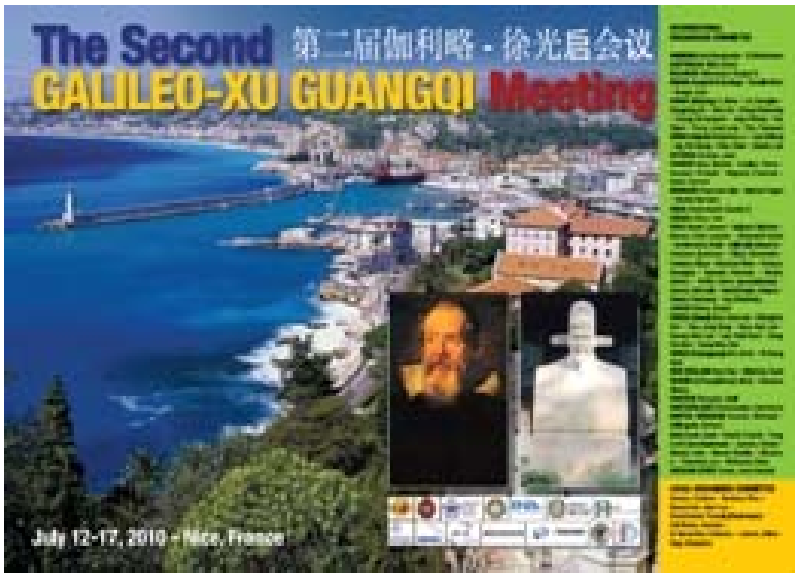
From 2009 to present, a series of joint meetings by ICRANet and Chinese Institutions joint meetings has regularly been established in China, namely, The Galileo Xu Guangqi (GX) meetings http://www.icranet.org/GXMeetings

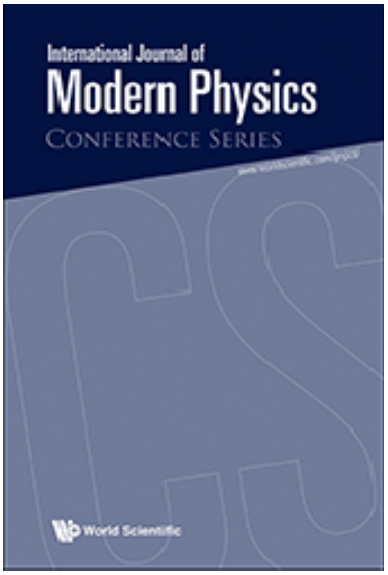
- 1st Galileo-Xu Guangqi Meeting, Shanghai (China), 2009 was organized by the Shanghai Observatory, CAS, Shanghai Jiao Tong University and ICRANet. Proceedings was edited by David Blair, Jing Yi Peng, Remo Ruffini, SheSheng Xue, http://www.worldscientific.com/toc/ijmpd/20/10





- 2nd Galileo-Xu Guangqi Meeting, Ventimiglia (Italy) and Nice (France), 2010 was organized by the Nice University, Beijing Observatory, CAS and ICRANet. Proceedings was edited by Remo Ruffini, http://www.worldscientific.com/toc/ijmpcs/12





- 3rd Galileo-Xu Guangqi Meeting, Beijing (China), 2011 was organized by Chinese National Observatory, CAS and ICRANet. Proceedings was edited by Zhen Cao, Xuelei Chen, Remo Ruffini, SheSheng Xue, Chengmin Zhang, Shuangnan Zhang; http://www.worldscientific.com/toc/ijmpd/22/11

- 4th Galileo-Xu Guangqi Meeting, Beijing (China), 2015 was organized by the ITP, Kavli Institute for Theoretical Physics in China at the Chinese Academy of Science (KITPC) and ICRANet to have an International Conference on Gravitation and Cosmology also for celebrating the 100 years anniversary of Einstein General Relativity. The conference was also cosponsored by the State Key Laboratory of Theoretical Physics (SKLTP/ITP-CAS), Kavli Institute for Theoretical Physics China (KITPC/ITP-CAS), Gravitation and Relativistic Astrophysics division of Chinese Physics Society (CPS), International Center for Theoretical Physics-Asian Pacific (ICTP-AP), Chinese Center for Advanced Science and Technology (CCAST), Yunnan Observatories at Chinese Academy of Sciences, Department of Astronomy at the University of Science and Technology of China (USTC), International College of University of Chinese Academy of Sciences (IC-UCAS), the Theoretical Physics Center for Science Facilities (TPCSF) at the Chinese Academy of Sciences (CAS), and ICRANet.

The Conference Proceedings was edited by Rong-gen Cai, Remo Ruffini, Yue-liang Wu.

These meetings were very successful, with more than hundred participants and most of them were from China, provided a platform for exchanging scientific idea both on theoretical and experimental aspects, in fact, many preliminary proposals of Chinese international scientific projects were first reported and discussed during these meetings. All these meetings in China were partially supported by the Neutral Science Foundation of China (NSFC) and other Chinese financial agencies.

It should be mentioned that in this most recent meeting GX4, Beijing, 2015, profs. T. D. Lee and C.N Yang received the Marcel Grassmann awards for their fundamental contributions to modern science in 20 century. The Vice president Zhang Yaping of CAS participated this great event of ceremony.

The Marcel Grassmann awards were delivered on May 4, 2015 at the MG14 satellite meeting the International Conference on Gravitation and Cosmology: the Fourth Galileo-Xu Guangqi Meeting in Beijing:

Goes to
FRANK C.N. YANG
"for deepening Einstein's geometrical approach to physics in the best tradition of Paul Dirac and Hermann Weyl"
Delivered at 9:50 am

Goes to
T.D. LEE (award received by Yu-Qing Lou on behalf of Prof. T.D. Lee)
"for his work on white dwarfs motivating Enrico Fermi's return to astrophysics and guiding the basic understanding of neutron star matter and fields"
Delivered at 7:00 pm

FRANK C.N. YANG

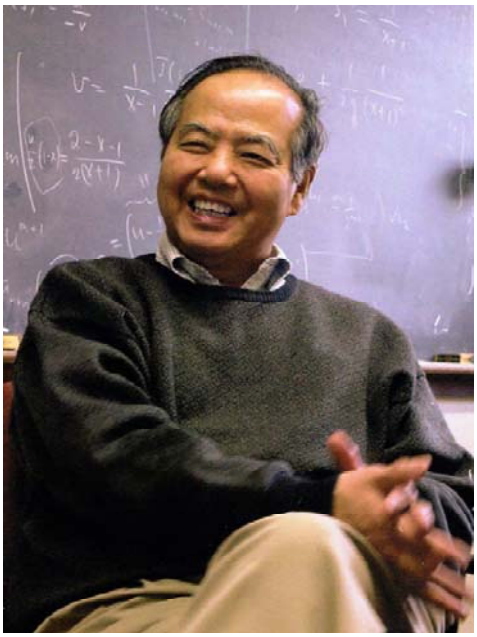
"for deepening Einstein's geometrical approach to physics in the best tradition of Paul Dirac and Hermann Weyl".

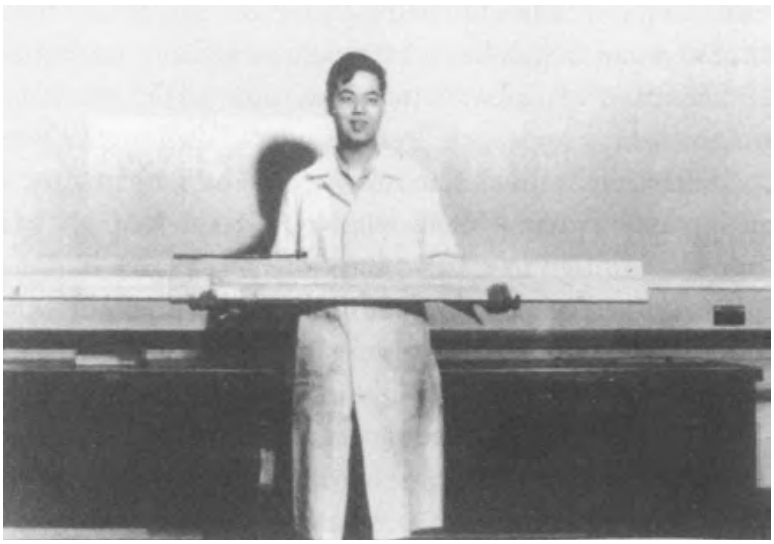
"… I would like to discuss some influence Fermi had in China: this is the case in which two of Fermi's Chinese students and collaborators had an unprecedented impact on science at the international level and triggered the scientific development of the largest nation in the world: China. During my second visit to China in 1979 I went to Kun Ming: it was quite an experience to see this beautiful location on the border of a lake so vividly described by Marco Polo. There was a train line constructed by the French reaching this town from Hanoi. There was also a beautiful university where two young students studied physics during World War II, there the professors from the Bei DA and Qing Hua university of Beijing and their families having escaped from the east of China ahead of the Japanese invasion. Their names were Chen Ning Yang and Tsung Dao Lee. At the end of the war they transferred to the USA: Frank C.N. Yang became Fermi's assistant and T.D. Lee was followed in his Ph.D. thesis by Fermi. The remarkable scientific career of these two young Chinese scientists is well recorded in the history of science. After Nixon's visit to China in 1972, Yang and Lee frequently went back to China to deliver lectures based on the Fermi tradition and today they are spending the greater part of their time in China organizing scientificcenters and activities. In 1979 Yang gave a lecture at the second MG meeting in Trieste (see figure on the right: C.N. Yang speaking with a thoughtful Pam Dirac listening). During the Third Galileo-Xu Guangqi Meeting in 2011 I had another pleasant meeting with C.N. Yang. This also gave me the opportunity to see Beijing University again, having originally seen it in 1978 after the cultural revolution with all its libraries burned, now renewed and reaching a new splendor. Next to the Zhou Pei-Yuan Institute are the offices of the C.N. Yang Center. We talked about our common friend Isidor Rabi and his role in collaborating with Eisenhower as President of Columbia University prior to the latter's election as President of the USA. We also talked about Fermi's role in formulating his theory of beta decay, of the adventures of the A-bomb and H-bomb projects and many other topics. This also gave me the chance to introduce him to our ongoing projects with ICRANet in Brazil."

From "Einstein, Fermi, Heisenberg and Relativistic Astrophysics: Personal Reflections by Remo Ruffini" World Scientific Singapore 2015.

T.D. LEE

"*for his work on white dwarfs motivating Enrico Fermi's return to astrophysics and guiding the basic understanding of neutron star matter and fields*"





"... Returning to the main topic of Fermi and astrophysics, it is interesting that according to T.D. Lee Fermi's original critical attitude expressed in his Trento lecture on the interior of stars was evolving towards the end of his life. As recalled by T.D. Lee in a talk held at a joint meeting of the APS and AAPT in February, 2010 "Remembering Enrico Fermi," Fermi was beginning to warm up towards astrophysics in his final years: Fermi asked Lee during his Ph.D. thesis the approximate temperature of the Sun at its center. Lee replied, "Ten million degrees." Fermi asked: "How do you know?" Lee told him he had looked it up. Fermi asked if he'd verified the number and Lee replied, "It's really complicated. It's not so easy to integrate these equations." Fermi suggested that Lee build a huge specialized slide rule that would enable the solution of two radiative transfer equations, one that involved the 18th power of the temperature, and the other that involved the reciprocal of temperature to the 6.5th power. Over the next few weeks Lee built a slide rule that was 6.7 feet long and carried out the necessary integration. 'It was great fun'... In the imperial Chinese tradition of the past, in each town in China there was a palace in which every year the best young astronomers were examined and selected and brought to the imperial palace to perform their study and research. Great credit goes to T.D. Lee for having reactivated this selection process on a large scale and having sent the most qualified young students not to the imperial palace in Beijing but to the leading universities in the USA for many years a similar program has been activated in Tokyo. These experiences, as well as our more limited effort with ICRA and ICRANet, have beensignificant components in guaranteeing that most impressive scientific, technological and industrial development that the entire world admires today in China. In some sense this authentic scientific and cultural evolution of modern China was triggered directly and indirectly by the influence of Fermi."

From "Einstein, Fermi, Heisenberg and Relativistic Astrophysics: Personal Reflections by Remo Ruffini" World Scientific Singapore 2015.

In this ceremony of Marcel Grassmann award, prof. C.N. Yang delivered an enlighten speech personally recalling prof. E. Fermi and his physics revolutionally impacting on human being life.

In this year 2017, we have finalized the organization of the Fifth Galileo-Xu Guangqi Meeting (GX5) held in 25-30 June 2017 in Chengdu, Emei mountain, Sichuan, China in conjunction with the 2017 Annual meeting of the Division of Gravitation and Relativistic Astrophysics of the Chinese Physical Society. In this Fifth GX5, in addition to presentations and discussions of scientific developments of Relativistic Astrophysics and related fields, we have presented the recent work of the reaching of the understanding of Gamma Ray Bursts (GRBs) afterglow phenomenon in the 20th anniversary of their discovery by Italian-Dutch satellite, BeppoSax in 1997. As in previous GX meetings, ongoing and preliminarily planned Chinese research projects and proposals with international co-operations have been arranged for presentations and discussions. These include the current collaboration between the research group of Astrophysics in Italian Ferrara University, prof. Filippo Frontera, and Chinese Institute of High Energy Physics (IHEP), CAS (High Energy Physics, Chinese Academy of Science), prof. Li Tipei and Zhuang Shuannan concerning the Hard X—ray Modulation Telescope (HXMT) mission by China's first astronomical satellite, as well as world-wide leading underground experimental projects for dark matter studies, PandaX in Sichuan China and Gran Sasso Laboratory in Abruzzo, Italy.

中国物理学会
Chinese Physical Society

International Center for Relativistic Astrophysics Network

Group photo of the participants to the 2017 Annual meeting of the Division of Gravitation and Relativistic Astrophysics of the Chinese Physical Society / The Fifth Galileo-Xu Guangqai Meeting, June 25 -30, 2017, Chengdu – China.

This meeting represents a CAS-TWAS-ICRA-ICRANet's collaboration with University of Roma "Sapienza", University of Nice "Sophia Antipolis", Stockholm University, Free University of Berlin, University of Bremen, ICRA, ENEA, INFN, ICTP, TWAS , Observatoire de la Côte d'Azur, CBPF, the Tartu Observatory, the Vatican Observatory, together with Chinese Academy Science institutions including: the Shanghai Astrophysical Observatory, the Institutes of High Energy Physics, the Institute of Theoretical Physics, the University of Science and Technology of China, as well as other Chinese leading universities among them: Shanghai Jiao-Tong University, Southwest Jiaotong University, the Beijing Normal University.

Prof. Ruffini during his talk at the 2017 Annual meeting of the Division of Gravitation and Relativistic Astrophysics of the Chinese Physical Society / The Fifth Galileo-Xu Guangqai Meeting, June 25 -30, 2017, Chengdu – China.

In this joint meeting, there were more than 450 participants coming worldwide, in particular Asia area, including many young Chinese researchers and Ph.D. students from all over China. The researchers and Ph.D. students of ICRANet institutions have actively participated the meeting. The joint organizing committee organized four day intensive scientific program of plenary and parallel sessions for about 120 speakers, and one day free discussion among participants while they were together or visiting the Chengdu area which has most rich cultural heritage and long history in China. The joint meeting program covered a broad topics, including but not limited to the theory of gravitation, gravitational wave physics, black hole physics, quantum gravity, gravitational experiments, curved space quantum field theory, relativistic astrophysics, dark matter and dark energy, and cosmology. The meeting was scientifically very successful and discussions and idea exchange were fruitful. Young students and researchers have made their important presentations to the meeting and particular awards were delivered to excellent presentations.

In addition, Prof. Ruffini presented a public lecture in Southwest Jiaotong University, undergraduate students were interested very much and raised many stimulating question and discussions. The fifth Galileo-Xu Guangqi meeting follows the first, second, the third and fourth meetings of this series held on October 2009 in Shanghai – China (http://www.icranet.org/galileo-xuguangqi), on July 2010 in Ventimiglia - Italy and Nice – France (http://www.icranet.org/2nd_galileo-xuguangqi), on October 2011 in Beijing (http://www.icranet.org/3gx) and on May 2015 always in Beijing (http://www.icranet.org/4gx) – China. The meeting's program is available here: http://gra2017.csp.escience.cn/dct/page/70010 At this link the photos of the meeting: http://www.icranet.org/index.php?option=com_content&task=view&id=1130 At this link the video of the public lecture of Professor Ruffini:

http://www.icranet.org/index.php?option=com_content&task=view&id=1120

The "China-Italy Science, Technology & Innovation Week", Beijing, China, 13-17 November 2017

From the 13th to 17th of November the "China-Italy Science, Technology & Innovation Week" 2017 Edition has been held in three different cities across China: Beijing, Chengdu and Guiyang, see: http://www.cittadellascienza.it/cina/

The meeting "China-Italy Science, Technology & Innovation Week" in Beijing. From right to left: prof. Remo Ruffini, Director of ICRANet, the Chinese Minister of Science and Technology, Wan Gang, Italian Minister of Education, University and Research, Valeria Fedeli. Fifth from right: Prof. Wen Biao Han, from the Shanghai Astronomical Observatory.

The initiative, dedicated to the science and technology cooperation activities between the two countries with the aim of creating scientific, technological and commercial partnerships in the innovative research-entrepreneurial system, is promoted by the Ministry of Science and Technology of China and from the Italian side by the Ministry of Education, University and Research – MIUR in cooperation with the Ministry of Foreign Affairs and International Cooperation – MAECI and it is coordinated by Città della Scienza of Naples. It is realized in synergy with the Ministry of Economic Development, the Ministry of Health and the Ministry of Environment and Land and Sea Protection and in cooperation with the National Research Council, Confindustria (the Italian association of Italian entrepreneurs) and the main Italian Universities and Research Centers, together with the Campania Region for the Sino-Italian Exchange Event.

The signature of collaboration agreements by Chinese and Italian partners. Standing: the Chinese Minister of Science and Technology, Wan Gang and Italian Minister of Education, University and Research, Valeria Fedeli. Third and forth from left: prof. Remo Ruffini from ICRANet, and Prof. Wen Biao Han, from the Shanghai Astronomical Observatory.

Professor Remo Ruffini, Director of ICRANet, has participated at the opening institutional ceremony of the event, launched in Beijing on November 14th in presence of the Italian Minister of Education, University and Research, Valeria Fedeli, and the Chinese Minister of Science and Technology, Wan Gang. In this occasion, Prof. Ruffini and Prof. Wen Biao Han, from the Shanghai Astronomical Observatory (SHAO) signed the "Agreement on joint Chinese-Italian activities in the field of relativistic astrophysics".

Agreement on joint Chinese-Italian activities in the field of relativistic astrophysics

Agreement on joint Chinese-Italian activities in the field of relativistic astrophysics

On the occasion of the solemn ceremony of the joint meeting "CHINA-ITALY SCIENCE, TECHNOLOGY & INNOVATION WEEK" (13-15 November 2017, Beijing), in the presence of the Italian Minister of Education, Universities and Research (MIUR), Valeria Fedeli, and of the Chinese Minister of Science and Technology, Wan Gang,

the following institutions in China and Italy agree to collaborate on joint activities in the period 2018 - 2019, including seminars and workshops.

In particular:

1. the Fifteenth Marcel Grossman Meeting to be held in Rome from 1 to 7 July 2018 MGXV (http://www.icra.it/mg/mg15/),

2. the Sixth Galileo-Xu Guangqi Meeting - GX6 (http://www.icranet.org/GXMeetings) to be held in Italy: in Pescara and Rome at ICRA/ICRANet, in Naples at the University "L'Orientale", and in Matera at the "Centro di Geodesia Spaziale Giuseppe Colombo" in 2019,

3. ASI, ICRA/ICRANet, INFN researchers will visit Chinese Institutions and, analogously, Chinese researchers will visit ASI, ICRA/ICRANet, INFN.

The research topics, in the field of Relativistic Astrophysics, to be covered by these joint activities, include: Gamma-Ray Bursts, Gravitational waves, Neutron Stars, Active Galactic Nuclei, Quasars, Neutrino astrophysics, Black Hole physics and astrophysics, Dark Matter, Quantum Gravity and Curved Space Quantum Field Theory as well as Nuclear Astrophysics.

The Chinese Institution:

Shanghai Astronomical Observatory (SHAO)
Chinese Academy of Science (CAS)
(e-mail: wbhan@shao.ac.cn)

The Italian Institutions are:

ASI (e-mail: presidenza@asi.it)
ASI – Centro Geodesia Spaziale G. Colombo Matera (e-mail: giuseppe.bianco@asi.it)
ICRA/ICRANet
(e-mail: ruffini@icra.it; secretariat@icranet.org)
INFN (presidenza@presid.infn.it)
University Campus Biomedico in Rome
(e-mail: s.filippi@unicampus.it)
University "l'Orientale" in Naples
(e-mail: rettrice.morlicchio@unior.it)
University of Rome "Sapienza"
(e-mail: rettore@uniroma1.it)

Chinese Representative signature in Beijing

Prof. WenBiao Han
e-mail: wbhan@shao.ac.cn

Italian Representative signature in Beijing

Prof. Remo Ruffini
e-mail: ruffini@icra.it

ICRANet

In this agreement SHAO, ASI, ASI – Centro Geodesia Spaziale G. Colombo Matera, ICRA/ICRANet, INFN, University Campus Biomedico in Rome, University "l'Orientale" in Naples, University of Rome "Sapienza, agree to collaborate on joint activities in the period 2018 - 2019, including seminars and workshops such as: the Fifteenth Marcel Grossman Meeting to be held in Rome from 1 to 7 July 2018 MGXV (http://www.icra.it/mg/mg15), the Sixth Galileo-Xu Guangqi Meeting - GX6 (http://www.icranet.org/GXMeetings) to be held in Pescara and Rome (Italy) at ICRA/ICRANet, in Naples at the University "L'Orientale", and in Matera at the "Centro di Geodesia Spaziale Giuseppe Colombo" in 2019. In addition, it was agreed that ASI, ICRA/ICRANet, INFN researchers will visit Chinese Institutions and, analogously, Chinese researchers will visit ASI, ICRA/ICRANet, INFN. The research topics, in

the field of Relativistic Astrophysics, to be covered by these joint activities, include: Gamma-Ray Bursts, Gravitational waves, Neutron Stars, Active Galactic Nuclei, Quasars, Neutrino astrophysics, Black Hole physics and astrophysics, Dark Matter, Quantum Gravity and Curved Space Quantum Field Theory as well as Nuclear Astrophysics.

For the text of the Agreement, see: http://www.icranet.org/documents/Chinese-Italian_activities.pdf

In addition to these regular meetings, a collaboration agreement between ICRANet and IHEP, CAS is already operative. Relevant is also the fundamental roles of profs. Remo Ruffini and Shuang Nan Zhang in directing their activities.
On the 4th of November 2016, the agreement between ICRANet and the IHEP, CAS has been renewed. This new agreement was signed by Prof. Shuangnan Zhang, Director of Center for Particle Astrophysics and Prof. Ruffini, Director of ICRANet. This agreement will be valid for other five years and the joint activities will consist in:

- promotion of theoretical and observational research activities within the field of Relativistic Astrophysics;
- the institutional exchange of faculty members, researchers, post- doctoral fellows and students;
- promotion of technological developments between IHEP and ICRANet;
- development of Data Centers for astrophysical data in all wavebands;
- the organization of training and teaching courses;
- the organization of seminars, conferences, workshops or short courses;
- joint publications

ICRANet coordinating center in Pescara, Italy (left) and IHEP, CAS in Beijing (right). The text of the agreement can be found here, see also Enclosure 5.

On July 15 2015, the similar agreement, the Memorandum of Understanding (MOU) between ICRANet and Leung Center for Cosmology and Particle Astrophysics (LeCoSpa), National Taiwan University, was renewed for other five years. Signature was made by the director of ICRANet prof Remo Ruffini and director of LeCoSpa prof Pisin Chen in Besso Foundation in Rome, Italy.

The text of the agreement can be found here, see also Enclosure 5.

On November 7, 2016, Professor Remo Ruffini gave a seminar entitled “Supernovae, Hypernovae and Binary Driven Hypernovae” at Shanghai Jiao Tong University, where the father of the Chinese rocket industry Hsue-Shen Tsien graduated from and now professor T.D. Lee has established a research Institute. The organizer of this event was the youngest member of the Chinese Academy of Sciences, Professor Jing Yipeng, director of the new formed center of Astronomy & Astrophysics (CAA), professor in the Department of Physics at this university and a former PhD student of Professor Ruffini. In this occasion Professor Ruffini and Professor Jing Yipeng discussed the cooperation between ICRANet and CAA including the 5th Galileo-Xu Guangqi Meeting (GX V) in June 2017. The collaboration agreement between ICRANet and CAA of Shanghai Jiao Tong University was discussed and currently proceeded by Professors Remo Ruffini and Jing Yi Peng.

All these will open the way to the entrance of China into ICRANet as a member state.

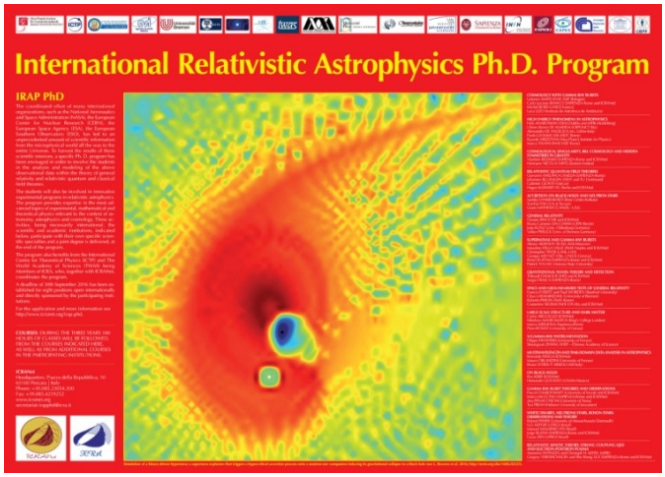


Indeed China today is one of the countries with the highest education levels and consequently with many far-reaching advances in observations of the universe from space, from Earth and from underground laboratories. These developments in which China is engaged as well as their laboratories, radio telescopes and space missions are all very much appreciated by the international scientific community. In order to promote this great tradition and its success in the development of an international school of relativistic astrophysics, ICRANet is leading an international coordination to create an astrophysical data center and engage students and professors in this endeavor through the IRAP PhD doctorate. Brazil, Russia, India, China and South Africa are joining this effort with Italy.

Chinese scientists of the next mission on the Moon, visited the ICRANet center in Pescara

After 40 years since the last mission of Soviet Union “Luna 24”, Chinese space mission “Chang'e 5” will come back on the Moon, with the goal to pick up and study samples of rocks. The mission is planned for November 2017.
On 2 of May 2017 20 Chinese scientists, a team, led by prof. Xie Gengxin, that work for the Chinese space mission “Chang'e 5”, visited the ICRANet headquarters in Pescara, together with Professor Paolo Giommi from ASI. They have met professors and researchers of ICRANet, and attended the presentation of Professor Ruffini, Director of ICRANet.

As recalled, ICRANet has established the joint international PhD program (IRAP) and the Shanghai Observatory of Chinese Academy of Science (CAS) has been already one of the members of the IRAP PhD consortium



This PhD program has involved Chinese students, Wang Yu, Li Liang, Wu Yuanbin, Yang Xiao Feng and Chang Yi Liang, Yen-Chen Chen, Han Wenbiao, see here and also Enclosure 7. We list some of very recent publications participated by Chinese researchers and students :

R. Ruffini, G. V. Vereshchagin, and S.-S. Xue, ``Electron–positron pairs in physics and astrophysics: From heavy nuclei to black holes" Phys. Rep. 487, 1 (2010).

W.-B. Han, R. Ruffini, and S.-S. Xue, ``Electron and positron pair production in gravitational collapse", Phys. Rev. D86 (2012) 084004.

R. Ruffini, Y.-B. Wu and S.-S. Xue, ``Einstein-Euler-Heisenberg theory and charged black holes", Physics Review D88, 085004 (2013).

A. Rueda, R. Ruffini, Y.-B. Wu, and S.-S. Xue, ``Surface tension of the core-crust interface of neutron stars with global charge neutrality", Phys. Rev. C89, 035804 (2014).

P. S. Chen and R. Ruffini, Did Gamma Ray Burst Induce Cambrian Explosion?, 2015, Astronomy Reports 59, 469, arXiv: 1403.7303.

R. Ruffini, Y. Wang, et al., Induced Gravitational Collapse in FeCO Core-Neutron Star Binaries and Neutron Star-Neutron Star Binary Mergers, 2015, IJMPA, 30, 28.

R. Ruffini, Y. Wang, et al., GRB 130427A and SN 2013cq: A Multi-wavelength Analysis of An Induced Gravitational Collapse Event, 2015, ApJ, 798, 10, arXiv:1405.7505.

R. Ruffini, M. Muccino, Y. Wang, et al., GRB 090510: A Genuine Short GRB from A Binary Neutron Star Coalescing into A Kerr–Newman Black Hole, 2016, ApJ, 831, 2, arXiv: 1607.02400.

R. Ruffini, M. Muccino, Y. Wang, et al., On The Classification Of GRBs and Their Occurrence Rates, 2016, ApJ 832, 2, arXiv: 1602.02732

G. B. Pisani, R. Ruffini, Y. Wang, et al., On The Universal Late X-ray Emission Of Binary-driven Hypernovae And Its Possible Collimation, 2016, ApJ, 833, 2, arXiv: 1610.05619.

R. Ruffini, M. Muccino, Y. Wang, et. al, GRB 140619B: A Short GRB from A Binary Neutron Star Merger Leading To Black Hole Formation, 2016, ApJ, 808,2, arXiv: 1412.1018

R. Ruffini, J. Rodriguez, Y. Wang, et l., On The Rate and On The Gravitational Wave Emission Of Short And Long GRBs, submitted to ApJ, arXiv: 1602.03545

L. Li, Y. Wang, et al., A Correlated Study Of Optical And X-ray Afterglows Of GRBs, 2015, ApJ, 805,1, arXiv: 1503.00976.

Y. L. Chang, B. Arsioli, P. Giommi, P. Padovani, 2WHSP: A Catalog Of HE And VHE Gamma-ray Blazars And Blazar Candidates, A&A, 598, A17 (2017), arXiv:1609.05808.

R. Ruffini, Y. Wang, et al., Early X-Ray Flares in GRBs, ApJ, 281, 1 (2018), arXiv:1704.03821

Y. Aimuratov, R. Ruffini, et al., GRB 081024B and GRB 140402A: Two Additional Short GRBs from Binary Neutron Star Mergers, ApJ, 844, 1 (2017), arXiv:1704.08179

L. Li, Y. Wang, et al.,A Large Catalogue of Multi-wavelength GRB Afterglows I: Color Evolution And Its Physical Implication, Accepted by ApJS, arXiv:1712.03704

Recently, a framework agreement between Agenzia Spaziale Italiana (ASI, Italian Space Agency) and CAS has been recently signed. An existing collaboration agreement between ASI and ICRANet is consenting, under the guidance of Prof. Paolo Giommi, the implementation of the Brazilian Science Data Center (BSDC), located at ASI, at the ICRANet Center in Pescara, in Rome, at the ICRANet Center at CBPF in Rio de Janeiro and at the University of Rio Grande do Sul in Porto Alegre. The BSDC is being developed as a world-class data center for astrophysics, capitalizing on the experience gathered at the ASI Science Data Center (ASDC) in the data analysis and on the theoretical work developed at ICRANet seats in Pescara, Rome and Yerevan. All ICRANet centers in Armenia, Brazil, France and Italy, as well as all Centers worldwide with signed collaboration agreements with ICRANet will benefit of the BSDC for their research activities.

We are also planning to present a request for financial support to the BRICS for the creation of a BRICS Science Data Center (or BRICS-SDC), coordinated by ICRANet on the topics of Relativistic Astrophysics. BRICS is an association of five major emerging national economies: Brazil, Russia, India, China and South Africa (please see https://en.wikipedia.org/wiki/BRICS). BRICS has recently established its Scientific, Technological and Innovation (STI) Framework Programme (please see: http://brics.rfbr.ru/rffi/eng/brics) with the pilot call in 2016. With the goal to participate in the next 2018 call, we are thinking to present a proposal of a joint activity with Brazilian, Russian, Indian, Chinese and South African Institutions, coordinated by ICRANet as an international organization.

Recently, together with Shanghai Astronomical Observatory (SHAO), CAS, we have made a proposal `` Multi-messenger Astronomy Approach to Dark Matter Physics " for applying the call

https://www.researchitaly.it/innovitalia/news/italia-cina-pubblicato-il-bando-maeci-nsfc-per-la-raccolta-di-progetti-di-ricerca-congiunti/

issued by Italian Ministero degli Affari Esteri e della Cooperazione Internazionale (MEACI) and Chinese National Neutral Science Foundation of China (NSFC) to have some financial supports to the ICRANet activities in both China and Italy, as well as exchange program of researchers and students for three years from 2018-2021.

Today China has been making unprecedented progresses in the development of observational activities from space, from the ground and underground. Everyone worldwide admires these great developments, from Chinese radio telescopes to Chinese underground laboratories and Chinese space missions. The past great success of our almost forty years of collaboration will also bring attention to the possible entrance of China into ICRANet to foster the great tradition and success in developing a school of knowledge in relativistic astrophysics, to participate to a coordinated proposal to BRICS for a common data Center and to promote participation of students and professors in joint IRAP PhD activities.

ICRANet Activities in Colombia

Introduction

The International Center for Relativistic Astrophysics Network, ICRANet, is an international organization promoting research activities in relativistic astrophysics (see Agreement on the Establishment and Statute of ICRANet). The Members of ICRANet are Armenia, Brazil, Italy, the State of Vatican City, Stanford University, the University of Arizona in Tucson as well as the International Center for Relativistic Astrophysics (ICRA).

The relativistic astrophysics is a relatively new field of research that uses the most advanced technologies both from earth- and space-based instruments which aims to the understanding of the astrophysical events in the entire Universe on the basis of the Einstein equations. The most successful researches, related to the understanding of the gravitational collapse, the neutron stars and the black holes, have guided the formation of a vast number of young researchers that are gaining the understanding of the signals detected by the greatest telescopes in the earth (e.g. in Latin America) and in space.

The collaboration with Colombia in the field of relativistic astrophysics dates back to 1984 with the joint organization, between ICRA in Rome and the Centro Internacional de Física – CIF in Bogotá, of the “First Equatorial School of Relativistic Astrophysics on Galactic Structures”, held from 13 to 24 February 1984. To keep memory of this important event, there were published the proceedings "Galaxies, Quasars and Cosmology", as a special volume of the "Advanced Series in Astrophysics and Cosmology", edited by Prof. L. Z. Fang and Prof. R. Ruffini, and published by World Scientific of Singapore. Many of the participants, then students, are now professors of the most important Colombian universities, and became the force driving the development of the relativistic astrophysics in Latin America not only in the topics of this school but also in new avenues of research.

An intense collaboration with professors of Universidad de Antioquia and Universidad Nacional de Colombia in Medellín was developed between 1986 and 2002 that resulted in about twenty publications in the most important international scientific journals, in topics such as structure and stability of galaxies, cosmology and the large structure of the universe, and opening a new collaboration with ICRA at Università Campus Biomedico di Roma.

More recently, from 2006 until today, a new wave of prolific scientific collaboration has occurred, with the participation of six students from Colombia in the International Relativistic Astrophysics Ph.D Program, the IRAP PhD. One of the promoters of this collaboration is a young Professor of ICRANet, Jorge Rueda, whom after obtaining his PhD in Rome, has obtained most important results in relativistic astrophysics at world level. It has been established an enormous collaboration with professors from the most important universities in Colombia from the north to the south of the national territory. It is important to mention as well the participation of scientist and students from Colombia in the Marcel Grossman Meeting of 2015 in Rome (MGXIV) which witnessed the participation of more than 1200 scientists from more than 50 nations, as well as the joint organization between ICRANet and Colombian universities of the “First Colombia-ICRANet Julio Garavito Armero Meeting” in 2015. There have been also signed cooperation agreements with major Colombian universities.

Based on the aforementioned premises, one of the main scopes now is to express to the Government of Colombia the opportunity for Colombia to become Member State of ICRANet.

Meeting and Conferences Organized by ICRANet in Colombia

It is worth to mention the joint organization between ICRANet and Colombian universities of the “First Colombia-ICRANet Julio Garavito Armero Meeting” (1JG), held in Bucaramanga from 23 to 25 November 2015 at Universidad Industrial de Santander (UIS) and on November 27 in Bogotá at Universidad Nacional de Colombia (UNAL), as part of the celebrations by ICRANet, within the International Year of Light promoted by UNESCO, of the Centenary of the Einstein equations of the theory of General Relativity and the Golden Jubilee of Relativistic Astrophysics. The goal of the conference was to bring together leading scientists working in theoretical and observational aspects of neutron stars, black holes, supernovae, gravitational waves, high-energy astrophysics and cosmology, to review the current status and to discuss further directions in gravity and relativistic astrophysics. The 1JG meeting was also the appropriate occasion to discuss with the Colombian astrophysics community the status and prospects of the ICRANet projects in Latin America, with special emphasis in Colombia. The 1JG meeting was also the occasion for several Colombian institutions to join in the organization, for the first time in Colombia, of an international conference on relativistic astrophysics with the aid of an international organization like ICRANet. The co-organizers Colombian institutions were: UIS, UNAL, Universidad de Los Andes (Uniandes), Universidad del Valle (Univalle), Universidad de Antioquia (UdeA), Planetario de Bogotá, Observatorio Astronómico Nacional, and CIF. For more details see: <http://www.icranet.org/1jg/>. The 1JG meeting was described in the ResearchItaly resource: “Colombia, un convegno per i 100 anni delle equazioni einsteiniane:” <https://www.researchitaly.it/innovitalia/eventi/colombia-un-convegno-per-i-100-anni-delle-equazioni-einsteniane/>

Poster of the 1JG Meeting held in Colombia from 23-25 November 2015 in the city of Bucaramanga at Universidad Industrial de Santander.

Group picture of the 1JG Meeting held in Bogotá from 25-27 November 2015. Place: Auditorio "Ciencia y Teconología CyT" at Universidad Nacional de Colombia.

Following the success of the 1JG, we are organizing the "Second Colombia-ICRANet Julio Garavito Armero Meeting" (2JG), which will be held in Bucaramanga from 30 July to 1 August 2018 at Universidad Industrial de Santander (UIS). This meeting, as the 1JG, is a satellite meeting of the next Marcel Grossman Meeting in 2018 (MGXV) to be held in Rome, and will be jointly organized between ICRANet and UIS.

Colombian students in the International Relativistic Astrophysics Ph. D. Program

One of the most important activities promoted by ICRANet is the International Relativistic Astrophysics Ph. D. Program, the IRAP-PhD. Since 2005 ICRANet co-organizes the IRAP-PhD together with: AEI – Albert Einstein Institute - Potsdam (Germany), CBPF - Brazilian Center for Physics Research (Brazil), Indian Center for Space Physics (India), INPE (Instituto Nacional de Pesquisas Espaciais, Brazil), Institut Hautes Etudes Scientifiques - IHES (France), Observatory of the Côte d'Azur (France), Observatory of Shanghai (China) Observatory of Tartu (Estonia), University of Bremen (Germany), University of Oldenburg (Germany), University of Ferrara (Italy), University of Nice (France), University of Rome "La Sapienza" (Italy), and the University of Savoy (France). The IRAP PhD program grants the first joint Ph.D. degree among the participating institutions, and has been a part of the prestigious Erasmus Mundus program of the European Commission.

Particular attention is going to be devoted in the forthcoming years, within the IRAP PhD program, to Universities of Latin America who have signed a collaboration agreement with ICRANet.

Currently, there is a massive particpation of Colombian students within the IRAP-PhD. To date, the IRAP-PhD has seen the enrollment of 103 students: 1 from Albania, 2 from Argentina, 5 from Armenia, 1 from Austria, 2 from Belarus, 11 from Brazil, 5 from China, 6 from Colombia, 1 from Croatia, 5 from France, 4 from Germany, 8 from India, 4 from Iran, 34 from Italy, 2 from Kazakhstan, 1 from Mexico, 1 from Pakistan, 3 from Russia, 1 from Serbia , 1 from Sweden, 1 from Switzerland, 1 from Taiwan, 2 from Turkey, 1 from Ukraine.

The six Colombian enrolled in the IRAP-PhD are:

- Juan David Uribe (from Universidad de Los Andes, Bogotá): enrolled in the IRAP-PhD in 2015.

- José Fernando Rodriguez (from Universidad Industrial de Santander, Bucaramanga): enrolled in the IRAP-PhD in 2014.

- Luis Gabriel Gómez (from Universidad Industrial de Santander, Bucaramanga): enrolled in the IRAP-PhD in 2013.

- Laura Marcela Becerra (from Universidad Industrial de Santander, Bucaramanga): enrolled in the IRAP-PhD in 2013.

- Diego Cáceres Uribe (from Universidad Nacional de Colombia, Bogotá): enrolled in the IRAP-PhD in 2011.

- Jorge A. Rueda (from Universidad Industrial de Santander, Bucaramanga): enrolled in the IRAP-PhD in 2006.

Exchange of Colombian students and Professors

Colombian students visiting ICRANet at Pescara and Rome

- Wilmer Daniel Pardo (PhD student from UDEA-Medellín): 6 month visit from November 2016-April 2017.

- Alexander Gallego (PhD student from UDEA-Medellín): 6 month visit from November 2016-April 2017.

- Ana Maria Navarro (Master student from UIS-Bucaramanga): 1 week visit in July 2015 during the MGXIV meeting.

- Laura Marcela Becerra (Master student from UIS-Bucaramanga): three month visit from April-June 2013.

Professors from Colombian universities visiting ICRANet at Pescara and Rome

- Prof. Antonio Enea Romano (from UDEA-Medellín): 15 days visit in January 2017.

ICRANet Professors visiting Colombian universities

- Prof. Jorge A. Rueda: 2 weeks visit in 2018 to UIS-El Socorro. During this visit it will be delivered the short 6 h course “Selected Topics in Relativistic Astrophysics: Physics and Astrophysics of Neutron Stars” at The International Schools for Young Astronomers (ISYA) 2018 held at the seat of UIS-EL Socorro, organized by the International Astronomical Union (IAU).

- Prof. Jorge A. Rueda: 1 week visit in October 2017 to UIS-Bucaramanga. During this visit Prof. Rueda received an award from UIS (see figure below) in the celebration of the 50th anniversary of the Physics Department of UIS. The text of the award says: “The Physics Department awards as a recognition for enhancing the name of UIS as a graduate of its academic programs with outstanding commitment.” During the visit Prof. Rueda delivered an invited talk at the Physics Department of UIS: “Hacia dónde va la Astronomía y la Astrofísica en Colombia?”.

- Prof. Jorge A. Rueda: 1 week visit in 2016 to UIS-Bucaramanga. During this visit Prof. Rueda received the Distinguished Former Student Award by UIS, delivered a short 8 h course at UIS on the Physics and Astrophysics of White Dwarfs and Neutron Stars, and delivered an Invited Lecture at the “III Jornadas Científicas Escuela de Física UIS” and a Public Lecture “Vida después de la muerte: los cataclismos más potentes del Universo” at the event “Café Científico” organized by Casa del Libro Total in Bucaramanga (see figure below).

Link to the video of the Public Lecture at the Casa del Libro Total in Bucaramanga.:

https://www.youtube.com/watch?v=Xs2rSYzwbvA

Award received by Prof. Rueda from Universidad Industrial de Santander (UIS) during the celebration from 23-27 October 2017 in Bucaramanga of the 50th anniversary of the Physics Department of UIS.The text of the award says: "The Physics Department awards as a recognition for enhancing the name of UIS as a graduate of its academic programs with outstanding commitment."

Public Lecture by Prof. Jorge Rueda at the event "Café Científico" held at Casa del Libro Total on December 15, 2016, in Bucaramanga.

- Prof. Remo Ruffini: 1 week visit in 2015 during the 1JG meeting at Bogotá. Prof. Ruffini visited UNAL, the Planetario de Bogotá, CIF, and COLCIENCIAS.

- Prof. Jorge A. Rueda: 2 week visit in 2015 during the 1JG meeting at Bucaramanga and Bogotá. Prof. Rueda visited UIS-Bucaramanga, UNAL-Bogotá, the Planetario de Bogotá, CIF, and COLCIENCIAS.

Cooperation Agreements

ICRANet has signed agreements of scientific cooperation with two major universities in Colombia.

- On April 2013 ICRANet signed a cooperation agreement with the Universidad Industrial de Santander (UIS) located in the city of Bucaramanga. UIS is recognized to have one of the most important research groups in relativistic astrophysics in Colombia.

Link to the agreement ICRANet-UIS:

http://www.icranet.org/documents/Agreement%20ICRANet-UIS%20signed.pdf

- On September 2016 with Universidad de Antioquia (UDEA) located in the city of Medellín. UdeA is the only university in Colombia to deliver degree in Astronomy.

Link to the agreement ICRANe-UDEA:

http://www.icranet.org/documents/agreementICRANet-UDEA.pdf

Additional cooperation agreements with COLCIENCIAS, with “Academia Colombiana de Ciencias Exactas, Físicas y Naturales” (ACCEFYN), with Universidad de Los Andes in Bogotá and with Universidad Nacional de Colombia and the Observatorio Astronómico Nacional in Bogotá are under formalization.

COOPERATION AGREEMENT
BETWEEN
UNIVERSIDAD INDUSTRIAL
DE
SANTANDER AND ICRANET

ICRANet is an International Center for Relativistic Astrophysics Network, composed by four Members States and three Universities and Research Centers: the Republic of Armenia, the Federal Republic of Brazil, the Republic of Italy, the Vatican State, the University of Tucson (USA), the Stanford University (USA) and ICRA (Italy). The Establishment and the Statute (signed on March 19th, 2003) have been officially recognized by law by the Italian Parliament on the 10th of February 2005 and published on *Gazzetta Ufficiale* n.53 of March 5th, 2005. Its Director and legal representative is Prof. Remo Ruffini and its headquarters are located in Italy in Pescara, Piazza della Repubblica 10.

The present Agreement has as its main objective to regulate activities aimed at strengthening academic cooperation between the Universidad Industrial de Santander (UIS) and the International Center for Relativistic Astrophysics Network (ICRANet), in accordance with the following clauses:

ACUERDO DE COOPERACIÓN
ENTRE LA UNIVERSIDAD
INDUSTRIAL DE
SANTANDER E ICRANET

La Universidad Industrial de Santander – UIS, ente universitario autónomo del orden departamental, creada mediante Ordenanzas 41 de 1940 y 83 de 1944 de la Asamblea Departamental de Santander, reglamentada por el Decreto 1300 de Junio 30 de 1982 de la Gobernación de Santander, Institución de Educación Superior reconocida por el Ministerio de Educación Nacional mediante Decreto 583 de 25 de Febrero de 1947, con NIT. 890.201.213-4 y domicilio principal en la ciudad de Bucaramanga, representada en este acto por su Rector y Representante Legal Prof. Álvaro Ramírez García, mayor de edad, vecino de Bucaramanga, identificado con la cédula de ciudadanía número 13'817.869 expedida en Bucaramanga, todo lo cual consta en el Acuerdo No. 001 de febrero 15 de 2013 del Consejo Superior.

El presente Acuerdo tiene como principal objetivo regular las actividades destinadas a fortalecer la cooperación académica entre la Universidad Industrial de Santander (UIS) y la red del Centro Internacional de Astrofísica Relativista (ICRANet), de acuerdo con las siguientes cláusulas:

Clause 1
Activities

The activities to be developed within the scope of the present cooperation Agreement will consist of joint actions including:

I -the institutional exchange of faculty members, researchers, graduate and post-graduate students;

II -the development of teaching and/or research activities, related to the areas in which UIS and ICRANet act;

III -the organization of seminars, conferences, workshops or short courses in those areas;

IV-the support of technical-scientific and cultural events and activities open to the public;

Cláusula 1
Actividades

Las actividades que se desarrollen en el ámbito del presente acuerdo de cooperación consistirán en acciones conjuntas incluyendo:

I -el intercambio institucional de profesores, investigadores, estudiantes de pregrado y estudiantes de posgrado;

II -el desarrollo de actividades de enseñanza y/o de investigación, relacionados con las áreas en las que la UIS e ICRANet actúan;

III-la organización de seminarios, conferencias, talleres o cursos de corta duración en esas áreas;

IV-el apoyo técnico-científico y eventos culturales y actividades abiertas al público;

V-the development of opportunities to form university teachers and researchers, by means of specialized advanced high-level courses;

VI -the organization of training and recycling courses, and the development of inter-institutional research areas associated to local

VII -joint publications;

VIII -public conferences and other actions aiming at the popularization of science;

IX -exchange of information concerning teaching and research activities in each institution.

V-el desarrollo de oportunidades para la formación de profesores universitarios e investigadores, por medio de cursos avanzados especializados de alto nivel;

VI-la organización de cursos y el desarrollo interinstitucional de las áreas de investigación relacionadas a los programas de posgrado local;

VII -publicaciones conjuntas;

VIII-conferencias públicas y otras acciones con miras a la popularización de la ciencia;

IX-intercambio de información sobre enseñanza y actividades de investigación en cada institución.

Clause 2
Addenda

The implementation of the activities envisaged by the contracting parties will be specified by means of Additional Terms to the present cooperation agreement. These will be signed by the contracting parties at the time of defining common projects, areas of research or education, or any other activities of mutual interest. The Addenda must include: a research project with time schedule, human and material resources and individuals responsible for the planned activities.

Cláusula 2
Adenda

La ejecución de las actividades previstas por las partes contratantes será especificada por medio de Términos Adicionales del acuerdo de cooperación presente. Esta será firmada por las partes contratantes en el momento de la definición de proyectos comunes, áreas de investigación o educación, o cualquier otra actividad de interés mutuo. La Adenda debe incluir: un proyecto de investigación programado, los recursos humanos y materiales y las personas responsables de las actividades previstas.

Clause 3
Commitments

Both Institutions must adopt, as a general principle within their respective budget constraints, the financing of the academic activities derived from this agreement. The party that sends faculty members or technicians can cover their transportation costs. The party that receives them can cover their living expenses during their stay. The faculty members must seek funding from national and/or international support agencies and institutions.

Sole paragraph: It is responsibility of the students, the technical and administrative staff, the professors and the researchers, involved in exchange activities obtain health insurance valid for the period of their activities.

Cláusula 3
Compromisos

Ambas instituciones deben adoptar, como principio general, dentro de sus limitaciones presupuestarias respectivas, la financiación de las actividades académicas derivadas de este acuerdo. La parte que envía profesores o técnicos pueden cubrir sus costos de transporte. La parte que se beneficia de ellos pueden cubrir sus gastos de manutención durante su estancia. Los profesores deben buscar fondos nacionales y/o organismos internacionales e instituciones de apoyo.

Párrafo único: Es responsabilidad de los estudiantes, el personal técnico y administrativo, los profesores y los investigadores, involucrados en actividades de intercambio de obtener un seguro médico válido para el período de sus actividades.

Clause 4
Academic
Products

When activities originating from the present instrument of cooperation result in products, improvements or innovations subject to rights, both parties will establish, according to proper regulatory legislation and by means of specific instruments, the conditions that will regulate property rights, in accordance with the law and proportionately to the contribution of each institution.

Cláusula 4
Productos
académicos

Cuando las actividades provenientes del presente instrumento de cooperación resultan en productos, mejoras o innovaciones sujetos a derechos, ambas partes establecerán, de acuerdo con la legislación reguladora adecuada y por medio de instrumentos específicos, las condiciones que regulan los derechos de propiedad, de acuerdo con la ley y en proporción a la contribución de cada institución.

Clause 5
Executors

The activities developed within the scope of this Cooperation Agreement will be carried out by members of both parties, appointed by each institution, according to the nature of the activities in each case, the parties being allowed to rely upon the support of external organizations.
An operational Standing Committee composed by two members of each of the signing Institutions will be nominated in the First Addendum of this Agreement. The Committee will meet at least once a year to draw plans for the joint events and collaborations. The meeting can occur by electronic means (such as e-conference).

Cláusula 5
Ejecutores

Las actividades desarrolladas en el ámbito de este Acuerdo de Cooperación se llevarán a cabo por miembros de ambas partes, designados por cada institución, de acuerdo con la naturaleza de las actividades en cada caso, a las partes se les permita contar con el apoyo de organizaciones externas. Un Comité Permanente operativo compuesto por dos miembros de cada una de las instituciones firmantes será nombrado en el Anexo Primero de este Acuerdo. El Comité se reunirá al menos una vez al año para elaborar planes para la organización de actos conjuntos y colaboraciones. La reunión puede darse por medios electrónicos (tales como e-conferencias)

Clause 6
Duration

The present instrument will be valid for 5 (five) years, starting from the date of its signature.

Cláusula 6
Duración

El presente instrumento tendrá una vigencia de 5(cinco) años, a partir de la fecha de su firma.

Clause 7
Cancellation

This present cooperation Agreement may be canceled by any of the parties, by means of notification at least 60(sixty) days in advance -which may be waived if both parties come to a consensual agreement- being advisable, however, to see that ongoing activities are maintained.

Cláusula 7
Cancelación

Este acuerdo de cooperación podrá ser cancelado por cualquiera de las partes, mediante notificación por lo menos 60(sesenta) días de antelación -lo cual podrá excusarse si ambas partes llegan a un acuerdo consensual- siendo aconsejable, sin embargo, ver que las actividades en curso se mantengan.

Sole paragraph: This instrument will be automatically extinguished if any circumstances foreseen in legislations ruling either one or both parties prevent the observance of its validity.

Párrafo único: Este instrumento será automáticamente anulado cuando las circunstancias previstas en las legislaciones gobernantes en una o ambas partes impidan el cumplimiento de su validez.

Clause 8
Jurisdiction

The parties consent to the jurisdiction of an appropriate court located in the city of Bucaramanga for any controversy or claim arising out of this Cooperation Agreement.

Cláusula 8
Jurisdicción

Las partes aceptan la jurisdicción de un tribunal competente ubicado en la ciudad de Bucaramanga para cualquier controversia o reclamo que surja de este Acuerdo de Cooperación.

All terms having been agreed upon, the representatives of the parties signed the present instrument, with two copies of the same document to ensure legal effect.

Todos los términos han sido acordados, los representantes de las partes suscriben el presente instrumento, con dos copias del mismo documento para garantizar un efecto legal.

For ICRANet:

Date 14/05/2013

Prof. Remo Ruffini
Director

Por UIS:

Fecha 12 ABR 2013

Prof. Álvaro Ramírez García
Rector

Universidad Industrial de Santander
ASESORIA JURIDICA DE RECTORIA

SPECIFIC COOPERATION AGREEMENT 21401601-233

BETWEEN

UNIVERSITY OF ANTIOQUIA (FACULTY OF EXACT AND NATURAL SCIENCES)

AND

ICRANET

ACUERDO ESPECÍFICO DE COOPERACIÓN 21401601-233

ENTRE LA

UNIVERSIDAD DE ANTIOQUIA (FACULTAD DE CIENCIAS EXACTAS Y NATURALES)

E

ICRANET

ICRANet is an International Center for Relativistic Astrophysics Network. The Establishment and the Statute (signed on March 19th, 2003) have been officially recognized by law by the Italian Parliament on the 10th of February 2005 and published on *Gazzetta Ufficiale* n.53 of March 5th, 2005. Its Director and legal representative is Prof. Remo Ruffini.

ICRANet es un Centro Internacional para el trabajo en red en Astrofísica Relativística. El establecimiento y sus estatutos (firmados en marzo 19 de 2003) han sido oficialmente reconocidos por ley por el Parlamento Italiano el 10 de febrero de 2005 y publicados en la Gazzeta Ufficiale n.53 de marzo 5, 2005. Su diretor y representante legal es el professor Remo Ruffini.

The University of Antioquia (UDEA) is an institution of Higher Education which provides a public service guided by principles of academic excellence and ethical responsibility. Nora Eugenia Restrepo Sánchez, bearer of citizen identity card number 66.812.679, who in his position as Dean of the School of Exact and Natural Sciences, duly authorized by the Superior Agreement 419 of 2014 and Superior Resolution 1993 of 2015, is designated to represent the University of Antioquia, an autonomous institution of higher education with special legal status, created by Act 71 of 1878 of the ex - Sovereign State of Antioquia, granted legal status by Act 153 of 1887, and governed by Act 30 of 1992 and other legal provisions applicable in accordance with its special legal status. Henceforth it shall be referred to as UDEA.

La Universidad de Antioquia (UDEA), desarrolla el servicio público de la Educación Superior con criterios de excelencia académica, ética y responsabilidad. Nora Restrepo Sánchez, mayor de edad, identificada con cédula de ciudadanía 66.812.679, en su calidad de Decana de la Facultad de Ciencias Exactas y Naturales, debidamente facultada por el Acuerdo Superior 419 de 2014 y Resolución Superior 1993 de 2015, actúa en nombre y representación de la Universidad de Antioquia, ente universitario autónomo con régimen especial, cuya creación fue determinada por la Ley 71 de 1878 del Estado Soberano de Antioquia, y con personería jurídica que deriva de la Ley 153 de 1887, regida por la Ley 30 de 1992 y demás disposiciones aplicables de acuerdo a su régimen especial, que en adelante se denominará UDEA.

ICRANet is an international research network on relativistic astrophysics, composed by four

ICRANet es una red de investigación internacional conformada por cuatro Estados

Members States and three Universities and Research Centers: the Republic of Armenia, the Federal Republic of Brazil, the Republic of Italy, the Vatican State, the University of Tucson (USA), Stanford University (USA) and ICRA (Italy).

miembro y tres Universidades y Centros de Investigación: La República de Armenia, la República Federal de Brasil, la República de Italia, el Estado del Vaticano, la Universidad de Tucson (EEUU), Universidad de Stanford (EEUU) e ICRA (Italia).

The Physics Institute of the Faculty of Exact and Natural Sciences of the University of Antioquia, develops research in the relativistic astrophysics area, generating publications in high impact international journals, and holds scientific collaboration with prestigious centers such as CERN in Switzerland, YITP in Japan, LECOSPA in United Kingdom and Turin University in Italy.

El Instituto de Física de la Facultad de Ciencias Exactas y Naturales de la Universidad de Antioquia, desarrolla investigación en el área de astrofísica relativística, generando publicaciones en revistas internacionales de alto impacto, y mantiene relaciones de colaboración científica con prestigiosos centros internacionales como el CERN en Suiza, el YITP en Japón, el LECOSPA en Taiwan, el King's College London en Reino Unido y la Universidad de Turin en Italia.

The present Agreement has as its main objective to regulate activities aimed at strengthening academic cooperation between the University of Antioquia (UDEA) and the International Center for Relativistic Astrophysics Network (ICRANet), in accordance with the following clauses:

El presente Acuerdo tiene como principal objetivo regular las actividades destinadas a fortalecer la cooperación académica entre la Universidad De Antioquia (UDEA) y la red del Centro Internacional de Astrofísica Relativista (ICRANet), de acuerdo con las siguientes cláusulas:

Clause 1
Activities

Cláusula 1
Actividades

The activities to be developed within the scope of the present cooperation Agreement will consist of joint actions including:

Las actividades que se desarrollen en el ámbito del presente acuerdo de cooperación consistirán en acciones conjuntas incluyendo:

I - the institutional exchange of faculty members, researchers, graduate and post-graduate students;

I - el intercambio institucional de profesores, investigadores, estudiantes de pregrado y estudiantes de posgrado;

II - the development of teaching or research activities, related to the areas in which UDEA and ICRANet act;

II - el desarrollo de actividades de enseñanza o de investigación, relacionados con las áreas en las que UDEA e ICRANet actúan;

III - the organization of seminars, conferences, workshops or short courses in those areas;

III - la organización de seminarios, conferencias, talleres o cursos de corta

IV - the support of technical- scientific and cultural events and activities open to the public;

V - the development of opportunities to form university teachers and researchers, by means of specialized advanced high-level courses;

VI - the organization of training and recycling courses, and the development of inter-institutional research areas associated with local programs;

VII - joint publications;

VIII -public conferences and other actions aiming at the popularization of science;

IX - exchange of information concerning teaching and research activities in each institution.

Clause 2
Addenda

The implementation of the activities envisaged by the contracting parties will be specified by means of Additional Terms to the present cooperation agreement. These will be signed by the contracting parties at the time of defining common projects, areas of research or education, or any other activities of mutual interest.The Addenda must include: a research project with time schedule, human and material resources and individuals responsible for the planned activities.

duración en esas áreas;

IV - el apoyo técnico-científico y eventos culturales y actividades abiertas al público

V - el desarrollo de oportunidades para la formación de profesores universitarios e investigadores, por medio de cursos avanzados especializados de alto nivel;

VI - la organización de cursos y el desarrollo interinstitucional de las áreas de investigación relacionadas a los programas de posgrado local;

VII - publicaciones conjuntas;

VIII - conferencias públicas y otras acciones con miras a la popularización de la ciencia

IX - intercambio de información sobre enseñanza y actividades de investigación en cada institución.

Cláusula 2
Adenda

La ejecución de las actividades previstas por las partes contratantes será especificada por medio de Términos Adicionales del acuerdo de cooperación presente. Esta será firmada por las partes contratantes en el momento de la definición de proyectos comunes, áreas de investigación o educación, o cualquier otra actividad de interés mutuo. La Adenda debe incluir: un proyecto de investigación programado, los recursos humanos y materiales y las personas responsables de las actividades previstas.

Clause 3
Commitments

Both Institutions must adopt, as a general principle within their respective budget constraints, the financing of the academic activities derived from this agreement. The party that sends faculty members or technicians can cover their transportation costs. The party that receives them can cover their living expenses during their stay. The faculty members must seek funding from national or international support agencies and institutions.

Sole paragraph: It is responsibility of the students, the technical and administrative staff, the professors and the researchers, involved in exchange activities obtain health insurance valid for the period of their activities

Clause 4
Academic Products

When activities originating from the present instrument of cooperation result in products, improvements or innovations subject to rights, both parties will establish, according to proper regulatory legislation and by means of specific instruments, the conditions that will regulate property rights, in accordance with the law and proportionately to the contribution of each institution.

Clause 5
Executors

The activities developed within the scope of this Cooperation Agreement will be carried out by members of both parties, appointed by each institution, according to the nature of the activities in each case, the parties being allowed to rely upon the support of external

Cláusula 3
Compromisos

Ambas instituciones deben adoptar, como principio general, dentro de sus limitaciones presupuestarias respectivas, la financiación de las actividades académicas derivadas de este acuerdo. La parte que envía profesores o técnicos pueden cubrir sus costos de transporte. La parte que se beneficia de ellos pueden cubrir sus gastos de manutención durante su estancia. Los profesores deben buscar fondos nacionales U organismos internacionales e instituciones de apoyo.

Párrafo único: Es responsabilidad de los estudiantes, el personal técnico y administrativo, los profesores y los investigadores, involucrados en actividades de intercambio de obtener un seguro médico válido para el período de sus actividades

Cláusula 4
Productos Académicos

When activities originating from the present instrument of cooperation result in products, improvements or innovations subject to rights, both parties will establish, according to proper regulatory legislation and by means of specific instruments, the conditions that will regulate property rights, in accordance with the law and proportionately to the contribution of each institution.

Cláusula 5
Ejecutores

Las actividades desarrolladas en el ámbito de este Acuerdo de Cooperación se llevarán a cabo por miembros de ambas partes, designados por cada institución, de acuerdo con la naturaleza de las actividades en cada caso, a las partes se les permita contar con el

organizations.
An operational Standing Committee composed by two members of each of the signing Institutions will be nominated in the First Addendum of this Agreement. The Committee will meet at least once a year to draw plans for the joint events and collaborations. The meeting can occur by electronic means (such as e-conference).

Clause 6
Contracting

As a general rule, those individuals participating in activities covered by this agreement shall remain bound by their contract with their institution of origin, and will not therefore enter into a contract with the Host university.

Clause 7
Duration

The present instrument will be valid for 5 (five) years, starting from the date of its signature.

Clause 8
Cancellation

This present cooperation Agreement may be canceled by any of the parties, by means of notification at least 60 (sixty) days in advance - which may be waived if both parties come to a consensual agreement- being advisable, however, to see that ongoing activities are maintained.

Sole paragraph: This instrument will be automatically extinguished if any circumstances foreseen in legislations ruling either one or both parties prevent the observance of its validity.

apoyo de organizaciones externas.

Un Comité Permanente operativo compuesto por dos miembros de cada una de las instituciones firmantes será nombrado en el Anexo Primero de este Acuerdo. El Comité se reunirá al menos una vez al año para elaborar planes para la organización de actos conjuntos y colaboraciones. La reunión puede darse por medios electrónicos (tales como e-conferencias).

Cláusula 6
Exclusión de Relación Laboral

Exclusión de Relación Laboral: Como regla general, las personas que participen de las actividades que se realicen al amparo de este convenio, como regla general, mantienen en todo momento su vínculo con su institución de origen, y por ende no adquieren relación laboral con la institución anfitriona.

Cláusula 7
Duración

El presente instrumento tendrá una vigencia de 5 (cinco) años, a partir de la fecha de su firma.

Cláusula 8
Cancelación

Este acuerdo de cooperación podrá ser cancelado por cualquiera de las partes, mediante notificación por lo menos 60 (sesenta) días de antelación - lo cual podrá excusarse si ambas partes llegan a un acuerdo consensual- siendo aconsejable, sin embargo, ver que las actividades en curso se mantengan.

Párrafo único: Este instrumento será automáticamente anulado cuando las circunstancias previstas en las legislaciones gobernantes en una o ambas partes impidan el cumplimiento de su validez.

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Clause 9
Conflict Resolution

The two parties hereby agree to exhaust every means of resolving conflicts in a friendly manner without resorting to legal action. Any conflict or doubt that may emanate from this agreement should therefore be settled by using available mechanisms of direct conflict resolution, such as extra-judicial conciliation, informal conciliation and compromise settlements.

All terms having been agreed upon, the representatives of the parties signed the present instrument, with two copies of the same document to ensure legal effect.

Cláusula 9
Solución de Controversias

Las partes convienen en agotar todos los medios para resolver amistosamente, sin litigios, cualquier controversia o duda que pudiera suscitarse con motivo de este convenio, para tal efecto, acudirán preferentemente, al empleo de mecanismos de solución directa de controversias.

Todos los términos han sido acordados, los representantes de las partes suscriben el presente instrumento, con dos copias del mismo documento para garantizar un efecto legal.

Clause 10
Addresses

The parties hereby state their respective addresses to be as follows:
UDEA Calle 67 No. 53 – 108, Medellín, Colombia.
ICRANet Piazza della Repubblica 10, Pescara, Italia.

Date 20 Sep / 2016

Prof. Remo Ruffini
Director and Legal Representative
ICRANet

Dr. Nora Restrepo Sánchez
Dean
Faculty of Exact and Natural Sciences
University of Antioquia

Cláusula 10
Domicilio

Las partes establecen que su domicilio será el siguiente:
UDEA Calle 67 No. 53 – 108, Medellín, Colombia.
ICRANet Plaza de la República 10, Pescara, Italia.

Fecha 20 Sep 2016

Prof. Remo Ruffini
Director y Representante Legal
ICRANet

Dr. Nora Restrepo Sánchez
Decana
Facultad de Ciencias Exactas y Naturales
Universidad De Antioquia

Entrance of Colombia in ICRANet

The 1JG meeting held in Bogotá from 25-27 November 2015 was the appropriate framework to discuss with the Colombian astrophysics community the possibility for Colombia to enter into ICRANet as Member State. On November 26 2015 the Director of ICRANet, Prof. Remo Ruffini and the ICRANet Faculty Professor Jorge A. Rueda, where invited to the Centro Internacional de Física (CIF) located at Universidad Nacional de Colombia at Bogotá, to discuss aspects of the entrance of Colombia into ICRANet with a group of people representing different Colombian institutions.

There were present in the meeting: the President of CIF, Prof. Eduardo Posada Flórez, the President of the Colombian Academy of Natural and Physical Sciences, Prof. Enrique Forero, the Director of Observatorio Astronómico Nacional, Prof. José Gregorio Protilla, as well as professors from Universidad Nacional de Colombia, Universidad de Los Andes, Universidad Industrial de Santander, Universidad Antionio Nariño, Universidad Sergio Arboleda, and representatives of the Red de Astronomía de Colombia (RAC). Representing the Government of Colombia there were present from the Ministry of Foreign Affairs, Dr. Stiven Calle, and from COLCIENCIAS, Dr. Carlos Ladino.

As a byproduct of this meeting, a Letter of Intent was redacted and signed. In the Letter the Colombian scientific community expresses the necessity of the participation of Colombia in ICRANet and asks the full support of the Government of Colombia to this initiative.

Meeting at CIF-Bogotá with Colombian scientific community to discuss the possible entrance of Colombia into ICRANet.

CENTRO INTERNACIONAL DE FÍSICA

CIF

ICRANet

LUGAR:

FECHA:

OBJETO / TEMA:

NOMBRE	ENTIDAD	CARGO	CELULAR	CORREO ELECTRÓNICO	FIRMA
Enrique Forero	Acad. Col CsExFisNat	Presidente	3175868628	enriqueforero2003@yahoo.es	
Carlos Arroyave	Univ. Antonio Nariño	Vicerrectr C, T e I	3015409410	vicerrectr.cti@uan.edu.co	
Walter Ocampo	Red astronomía Colombia-RAC	Vocal	3159210120	astronomia.colombia.rac@gmail.com	
Raul Joya	Universidad Sergio Arboleda	Director	3102697341	raul.joya@usa.edu.co	
STIVEN CALLE	CANCILLERIA	3 SECRETARIO	3004268435	stiven.calle@cancilleria.gov.co	
Jaime Forero	Univ. Andes	Profesor	3108515762	je.forero@uniandes.edu.co	
Cristian Gdez F.	Red de Astr. de Colombia	Vocal	3012955958	crisgotez005@hotmail.com	
Carlos Ladino	Colciencias	cta	3016583558	cabadino@colciencias.gov.co	
José Gregorio Portilla	Universidad Nacional de Colombia-Observatorio Astronómico Nacional	Director	3013391611	jgportillab@unal.edu.co	
JORGE A. RUEDA H.	ICRANet	Profesor	3044347283 +39 3281245442	jorge.rueda@icra.it	
Luis A. Nuñez	Univ. Industr. Santander	Professor	3183062194	lnunez@uis.edu.co	
Remo Ruffini	ICRANet	Professor	+393394752966	ruffini@icra.it	

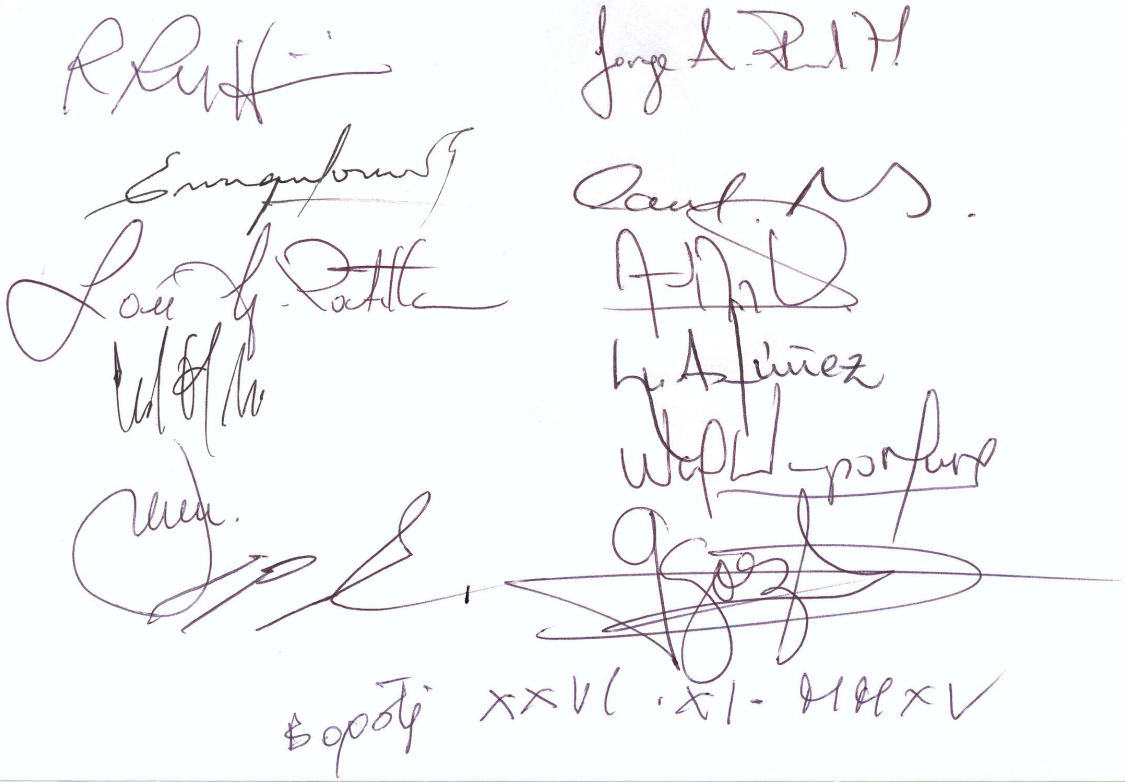
List of signatures of the attendants of the meeting held at CIF-Bogotá on November 26 2015 to discuss the possible entrance of Colombia into ICRANet.

26 de Noviembre de 2015

CARTA DE INTENCIONES ENTRADA DE COLOMBIA COMO ESTADO MIEMBRO A ICRANET

Reunidos en el Centro Internacional de Física en la Ciudad Universitaria en Bogotá, Colombia luego de discutir el visible crecimiento de la comunidad de Astronomía y Astrofísica colombiana vemos como necesaria la participación de Colombia en la Red de Centros para la Astrofísica Relativista (ICRANet). Esta colaboración internacional requiere el apoyo directo del Gobierno central para el crecimiento científico, económico, tecnológico y la proyección internacional de Colombia. ICRANet es una institución científica de gran trayectoria y experiencia en colaboraciones internacionales tanto en el ámbito de investigación como de formación de recursos humanos altamente especializados.

Por ello expresamos nuestro más entusiasta interés de seguir el desarrollo de este proyecto y posiblemente participar en las reuniones de organización para contribuir en el éxito de esta iniciativa.



Letter of Intent signed at CIF-Bogotá on November 26 2015 during the 1JG meeting. A representative part of the Colombian scientific community expresses the necessity of the entrance of Colombia into ICRANet and asks full support to the Government of Colombia.

Note by the Colombian Consul in Rome, Dr. Beatriz Helena Calvo Villegas, in her monthly message of November 2016 on ICRANet

The activities of ICRANet in promoting relativistic astrophysics in Colombia has been recently recognized by the Colombian Consul in Rome, Dr. Beatriz Helena Calvo Villegas, in her monthly message of November 2016, in which it was also mentioned the possibility of the entrance of Colombia into ICRANet as Member State. Original text of the Consul's message:

ACTIVIDADES CIENTÍFICAS DE COLOMBIANOS EN ITALIA

“Me complace reportar la colaboración científica entre la Red del Centro Internacional para la Astrofísica Relativista (ICRANet por sus siglas en inglés) y profesores colombianos de varias universidades, facilitada por el establecimiento de acuerdos de colaboración, tales como el realizado con la Universidad Industrial de Santander (UIS), firmado en abril de 2013, y el más reciente con la Universidad de Antioquia, firmado el 20 de septiembre de 2016. Uno de los resultados más importantes de esta colaboración es que estudiantes colombianos han recibido becas para realizar sus estudios en Italia, en el doctorado internacional de astrofísica relativista. Actualmente 6 de ellos se encuentran en Roma y Pescara trabajando en sus investigaciones doctorales bajo la supervisión del Profesor Jorge Rueda, "Egresado Distinguido 2016" de la Facultad de Ciencias de la UIS.

De igual manera, dos estudiantes de doctorado de la Universidad de Antioquia realizan una pasantía de 6 meses en ICRANet, a partir del mes de noviembre y se registró un nuevo estudiante de doctorado colombiano, egresado de la Universidad de los Andes, con beca de Colciencias.

Existe la expectativa de una posible adhesión de Colombia como país miembro a ICRANet.”

Opening of the first ICRANet center in Colombia

Following the success of the processes of adhesion of Armenia, Brazin and Belarus into ICRANet we plan, as a first step towards the entrance of Colombia as Member State of ICRANet, the opening in 2018 of the first ICRANet center in Colombia. The center is expected to be hosted at Universidad Industrial de Santander (UIS) and will promote the development of Relativistic Astrophysics in Colombia and Latin America. The inauguration of the center is expected to be celebrated in the occasion of the 2JG meeting to be held from 30 July to 1 August 2018 at UIS-Bucaramanga.

ICTRANet Activities in Kazakhstan

ICRANet

International Center for Relativistic Astrophysics Network

Pescara, 25/01/2018
Prot. 3527

Academician Tolegen Kozhamkulov
President of Kazakh Physical Society
Al-Farabi Kazakh National University
kometa661@mail.ru

Dear Prof. Kozhamkulov,

The visit to Brazil has been extremely intense and we are starting a collaboration in the ICRANet Science Data Center in Brazil open to all ICRANet Member States which will be also open to Kazakhstan. I had to stop in Rome in order to prepare immediately all the documentation for the meeting of the ICRANet Board of 7th of February for approval.

I have also to prepare a contribution to the United Nations meeting on the "Open Universe" initiative on the 2nd of February in Vienna. In this respect I have also inserted your name in the list as invited person to a Meeting in Rome at the Vatican Observatory on 27-28 of March. You will receive and invitation soon.

These reasons have forced me to postpone my visit to Astana for a few weeks. I am ready to come to Astana after the 8th of February. This will give you also an occasion to go over the program I have sent you and eventually add further topics for discussions. Particular attention should be given to the financial support and the participation of all four Kazakhstan institutions: Al-Farabi Kazakh National University, Kazakhstan Physical Society, National Center of Space Research and Technology and Eurasian National University. Please let me know your proposed dates so that I will be transmitting to the Italian Ambassador.

With my warm personal regards,

Уважаемый проф. Кожамкулов!

Мой визит в Бразилию был очень насыщенным, так как теперь мы начинаем сотрудничество Центра Научных Данных ICRANet в Бразилии со всеми государствами-членами сети ICRANet, среди которых также будет Казахстан. Я вынужден был изменить планы и остановится в Риме, чтобы подготовить документы для утверждения на заседании исполнительного комитета ICRANet 7 февраля.

Также мне необходимо подготовить доклад для конференции, проводимой ООН, в рамках инициативы “Открытая Вселенная” 2 февраля в Вене. В связи с этим я включил ваше имя в список приглашённых гостей на организуемую нами конференцию в Риме в Обсерватории Ватикана, которая пройдёт 27-28 марта. Мы вышлём вам пригласительное письмо.

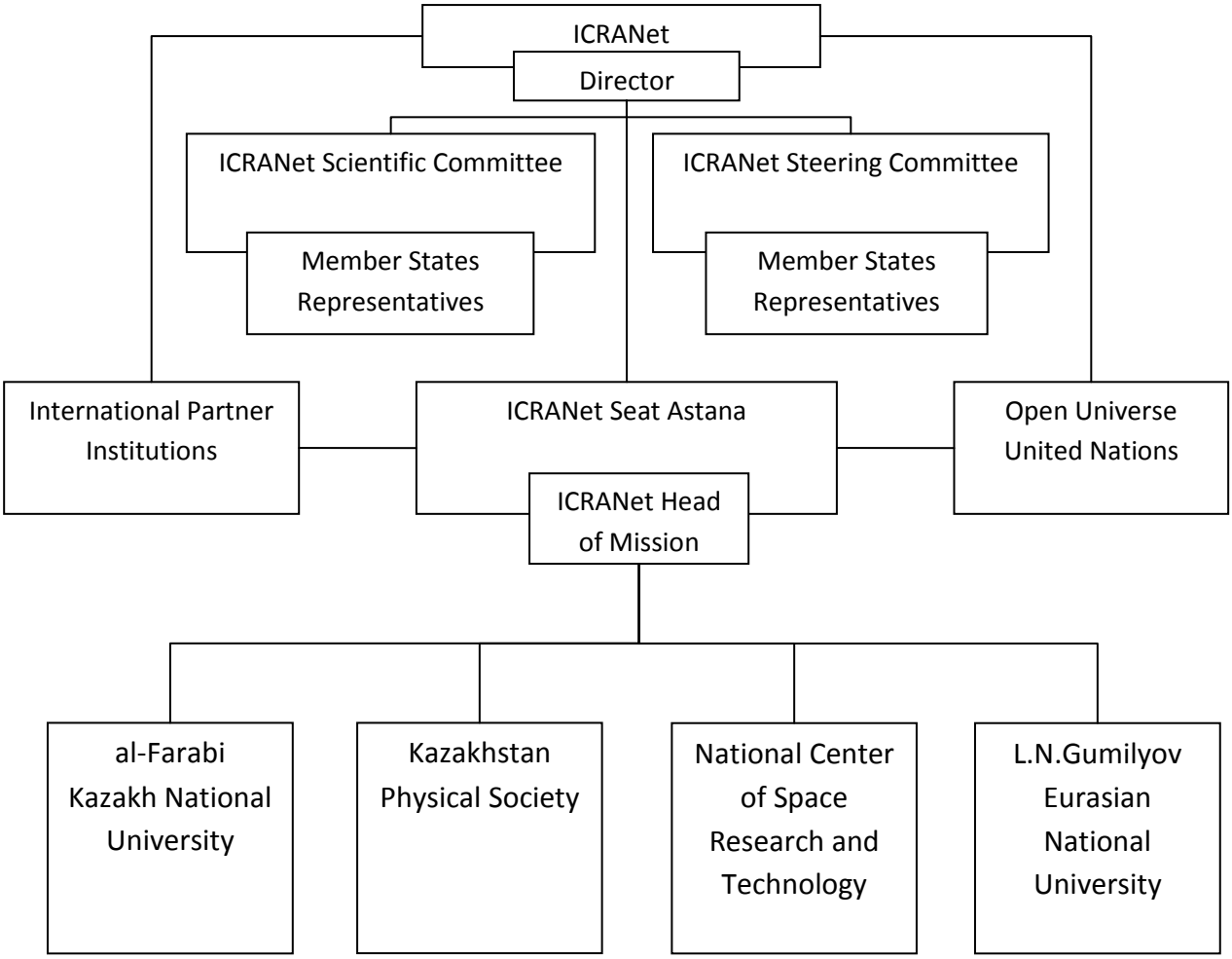
Все эти причины вынудили меня отложить визит в Астану на несколько недель. Я готов приехать в Астану после 8 февраля. Это время предоставляет возможность тщательно проработать высланную вам программу и расширить круг тем для обсуждения. Особое внимание следует уделить вопросу о финансовой поддержке и участию всех четырёх казахстанских организаций: Казахский национальный университет, Казахстанское физическое общество, Национальный центр космических исследований и технологий, Евразийский университет. Пожалуйста, укажите возможные даты встречи, чтобы мы могли известить и посла Италии.

С моими наилучшими пожеланиями,

Prof. Remo Ruffini
Director of ICRANet

Piazza della Repubblica, 10 - 65122 Pescara - Italy - Phone: +39.085.25054200 - Fax: +39.085.4219252
E-mail: director@icranet.org - secretariat@icranet.org - http://www.icranet.org
C.F.: 91080720682

Implementation proposal for the establishment of the ICRANet Center in Kazakhstan



Descrition of Kazakhstan ICRANet Center

1. The Kazakhstan ICRANet Center (ICRANet Kazakhstan) is jointly organized by the four Institutes:
   - al-Farabi Kazakh National University (71 al-Farabi Ave., Almaty, Republic of Kazakhstan);
   - Kazakhstan Physical Society (71 al-Farabi Ave., Almaty, Republic of Kazakhstan);
   - Joint-Stock Company “National Center of Space Research and Technology” (15, Shevchenko St., Almaty, 050010, Kazakhstan);
   - L.N.Gumilyov Eurasian National University (Satpayev Str., 2, Astana, Republic of Kazakhstan, 010008);

   all of which have collaboration agreement signed with ICRANet.

2. The Headquarter of the Center will be located in Astana at the L.N.Gumilyov Eurasian National University (Satpayev Str., 2, Astana, Republic of Kazakhstan, 010008) and additional seat will be located in Almaty in the building of the National Academy of Sciences of the Republic of Kazakhstan (28 Shevchenko Street, Almaty, Kazakhstan).
3. The current activities of the Center is to provide 3 Research Position for Scientists, 3 pos-doc participating in the ongoing research activities, and provide as well secretarial and technical support (3 positions). These positions will be covered with local contracts. In addition 3 positions in the IRAP PhD program will be also covered. The above activities will be implemented assuring the mobility of the participating Kazakhstan scientists in all ICRANet Centers: Pescara, Rome, Nice, Rio de Janeiro.
4. The main priority of the Center is the work toward the adhesion of Kazakhstan to ICRANet as a Member State and the signature of the Seat Agreement.

The adhesion of Kazakhstan to ICRANet and the signature of the Seat Agreement

1. The ICRANet Seat in Kazakhstan will be coordinated by the ICRANet Head of Mission (HoM), who responds directly to ICRANet Director through regular reports to the ICRANet Scientific Committee and the ICRANet Board.
2. The HoM also has the responsibility to establish connections with the ICRANet Brazilian Science data Center BSDC in direct contacts with the National Center of Space Research and Technology, and the Fessenkov Astrophysical Institute as well as the observatories, data centers and data providers, both nationally and internationally.
3. It is the responsibility of the HoM to interface with activities of the United Nations Open Universe Initiative, of which the ICRANet and the BSDC itself are founding members.

On the specific roles

1. **The Director of ICRANet** oversees all ICRANet operations, and he is the ultimate responsible of ICRANet for all matters. The Director of ICRANet is elected by the ICRANet Board for a 5-year term, see ICRANet Statute enclosed.
2. **The Representative of Kazakhstan at the Scientific Committee of ICRANet** is distinguished scientist from the member countries of ICRANet. He/she is nominated by the Foreign Minister of Kazakhstan from a list indicated by the ICRANet HoM, and is responsible for advising the Committee on the scientific activities of ICRANet. The Scientific Committee Representatives serve with a mandate of three years, see ICRANet Statute enclosed.
3. **The Representative of Kazakhstan at the ICRANet Steering Committee** is a career diplomat directly nominated by the Foreign Minister of Kazakhstan. The ICRANet Steering Committee in the main governance body of ICRANet, see ICRANet Statute enclosed. The ICRANet Steering Committee Representatives serve with a mandate of three years.
4. **ICRANet Head of Mission (HoM)** is nominated by the Director of ICRANet, after endorsement by the ICRANet Steering Committee, following advice by the ICRANet Scientific Committee. The HoM can be either a national or foreign citizen, as stated in the Seat Agreement of ICRANet. The HoM is based at the Seat of ICRANet Kazakhstan and must be available for performing international mission. The HoM, for the duration of his 3- year term, is a full-time ICRANet employee, who can be lent from public service to fill this

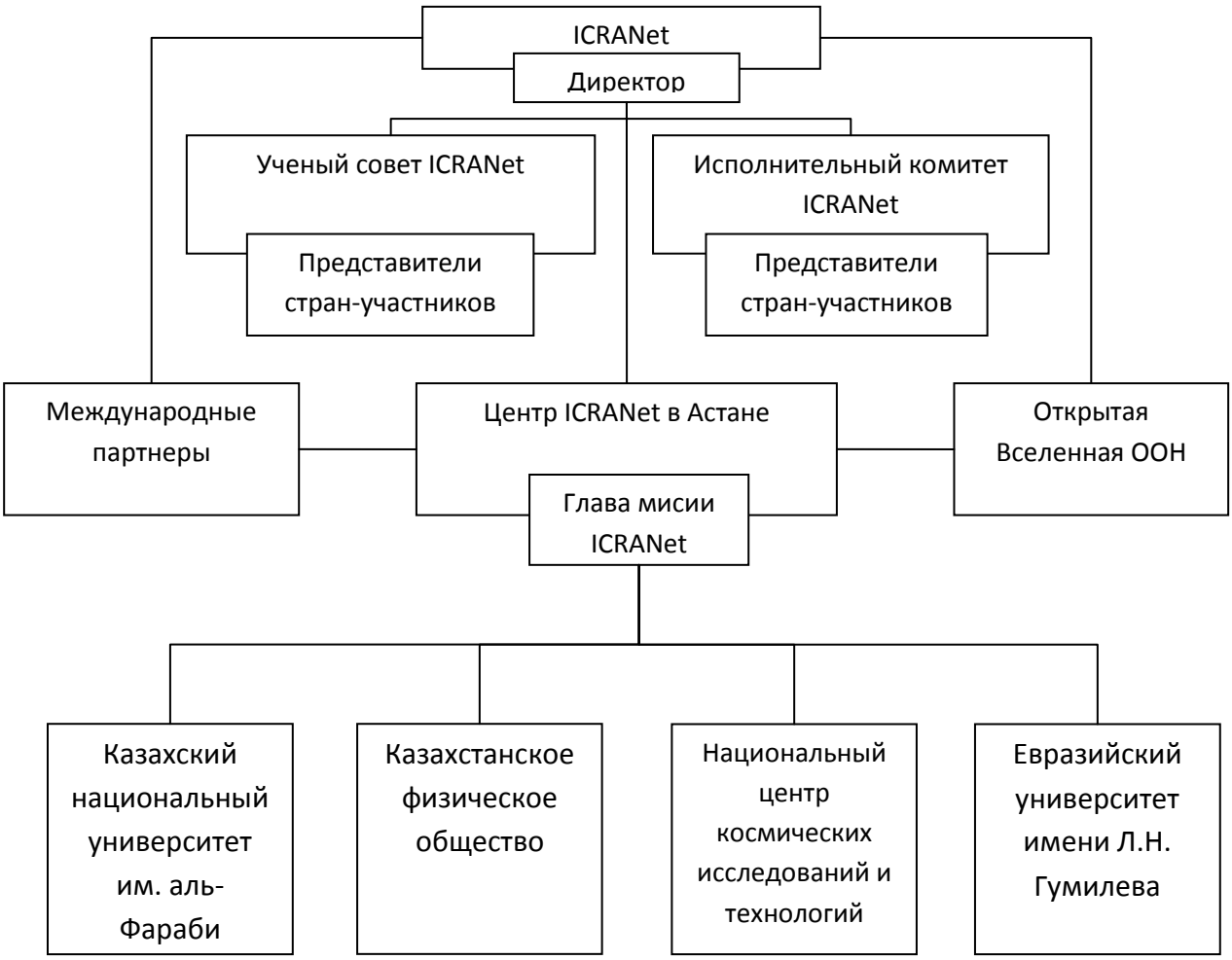
position. In the case of a national public servant, the HoM will receive an stipendium from ICRANet equivalent to his regular employment salary, plus additional mission allowances. The HoM should have recognised experience in international scientific activities. Attributions of the HoM are established in the Seat Agreement. In particular, the HoM is responsible for drafting the list of recommended names for the Scientific Committee of ICRANet.

5. **ICRANet Kazakhstan Council Representatives** are the members are the directors, presidents or Rectors of the respective member institutions.

Immediate Actions Required for Implementation

1. To guarantee the establishment of Kazakhstan ICRANet Center in this transitional phase a financial support of 400.000 Euro per year is provided by the Government of Kazakhstan for the first five years.
2. All four Institutions agree to participate to the definition of scientific programs of research, enter in the international scientific research network of ICRANet and activate the data analysis procedures, participating to the research in the BSDC.
3. The approval of this document for submission to the Meeting of the ICRANet Steering Committee on February 7th 2018.

Проект учреждения центра ICRANet в Казахстане



Описание центра ICRANet в Казахстане

1. Центр ICRANet в Казахстане (ICRANet Казахстан) формируется совместно следующими четырмя организациями:
   - Казахский национальный университет им. аль-Фараби (Республика Казахстан, Алматы, 050040 пр. аль-Фараби, 71);
   - Казахстанское физическое общество (Республика Казахстан, Алматы, 050040 пр. аль-Фараби, 71);
   - Акционерное общество «Национальный центр космических исследований и технологий» (050010, г. Алматы, ул. Шевченко, 15);
   - Евразийский университет имени Л.Н. Гумилева (010008, Республика Казахстан, г.Астана, ул.Сатпаева, 2);

   Все они уже имеют соглашения о сотрудничестве с ICRANet.

2. Штабквартира центра будет располагаться в Астане в Евразийском университете имени Л.Н. Гумилева (010008, Республика Казахстан, г.Астана, ул.Сатпаева, 2), а также будет иметь офис в Алматы в здании Национальной академии наук Республики Казахстан (ул. Шевченко 28, Алматы, Казахстан).
3. Центр будет располагать 3 позициями для ученых, 3 для пост-доков, участвующих в текущих научных проектах, а также обеспечит позиции секретаря и технической поддержки (3 позиции). Эти позиции будут оформлены локальными контрактами. Кроме того, 3 позиции будут открыты в рамках программы IRAP PhD. Работа будет организована с обеспечением мобильности казахстанских ученых и возможностью посещения центров ICRANet в Пескаре, Риме, Ницце и Рио де Жанейро.
4. Приоритетом работы центра является вступление Казахстана в ICRANet как государства-члена и подписание договора о представительстве.

Вступление Казахстана в ICRANet как государства-члена и подписание договора о представительстве

1. Представительство ICRANet в Казахстане будет координироваться Главой Миссии ICRANet (ГМ), который подответственен директору ICRANet через регулярные отчеты ученому совету и исполнительному комитету ICRANet.
2. ГМ также ответственен за установление связей с бразильским центром научных данных ICRANet BSDC в прямом контакте с Национальным центром космических исследований и технологий, и астрофизическим институтом им. Фесенкова, а также с обсерваториями, центрами данных и провайдерами данных, на национальном и международном уровнях.
3. В ответственность ГМ входит участие в работе инициативы ООН Открытая Вселенная, в которой ICRANet и BSDC состоят как организации-основатели.

Роли представителей

1. **Директор ICRANet** контроллирует все действия ICRANet он полностью ответственен за всю активность ICRANet. Директор ICRANet выбирается исполнительным комитетом ICRANet на 5-летний срок, см. статут ICRANet.
2. **Представитель Казахстана в ученом совете ICRANet** является известным ученым из стран-членов ICRANet. Он/она назначается министром иностранных дел Казахстана из списка, подготовленного ГМ ICRANet, он является советником ученого совета ICRANet по научным вопросам. Представители в ученом совете ICRANet имеют мандат на 3 года, см. статут ICRANet.
3. **Представитель Казахстана в исполнительном комитете ICRANet** является дипломатом, назначаемым напрямую министром иностранных дел Казахстана. **Исполнительный комитет ICRANet** является основной управляющей структурой ICRANet, см. статут ICRANet. Представитель в исполнительном комитете ICRANet имеет мандат на 3 года.
4. **Глава миссии ICRANet** назначается директором ICRANet, после согласования с исполнительным комитетом ICRANet и ученым советом ICRANet. ГМ может быть либо гражданином Казахстана, либо иностранным гражданином, как описано в договоре о

представительстве ICRANet. ГМ находится в представительстве ICRANet в Казахстане и должен быть готов к выполнению международных миссий. ГМ работает по контракту 3 года, он является сотрудником ICRANet на полную ставку, который может быть приглашен с государственной службы. В случае, если он госслужащий, ГМ будет получать вознаграждение, эквивалентное его обычной зарплате, а также дополнительные средства для миссий. ГМ должен иметь большой опыт в международной научной деятельности. Компетенции ГМ устанавливаются в договоре о представительстве. В частности, ГМ ответственен за подготовку списка рекомендованных членов ученого совета ICRANet.

5. **Представители в совете ICRANet Казахстан** являются директорами, президентами и ректорами организаций-членов.

Срочные действия, необходимые для учреждения

1. Для того, чтобы гарантировать создание центра ICRANet в Казахстане на этой переходной фазе финансовая поддержка в размере 400.000 евро в год будет обеспечиваться со стороны правительства Казахстана на протяжении первых пяти лет.
2. Все четыре организации согласны участвовать в подготовке научных программ исследований, войти в международную научно-исследовательскую сеть ICRANet и активировать процедуры анализа данных, участвуя в исследованиях в BSDC.
3. Одобрение этого документа для обсуждения на заседании исполнительного комитета ICRANet 7 февраля 2018.