Observatoire de la Côte d'Azur

veritas iustitia libertas
Freie Universität Berlin

ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

Université de Chambéry Annecy Savoie

La Sapienza
Università degli Studi di Roma

Université Nice Sophia Antipolis

the International Relativistic Astrophysics Ph.D.

IRAP PhD

The field of relativistic astrophysics has become one of the fastest progressing fields of scientific development.
This is due to the fortunate interaction of a vast number of international observational and experimental facilities in space, on the ground, underground, in the polar ice caps, and in the deep ocean, supported by a powerful theoretical framework based on Einstein's theory of general relativity and relativistic quantum field theory.
In 1995, the International Center for Relativistic Astrophysics in Rome (ICRA) initiated an International Network of Centers in the field of Relativistic Astrophysics (ICRANet) which has this year acquired the status of International Organization. The ICRANet combines the research powers of leading institutions in the Americas, Australia, Asia and Europe. The coordinating center is located in the town of Pescara, Italy.
In parallel with these activities, the International Relativistic Astrophysics Ph.D. Program (IRAP PhD) has been created with the goal of training a highly qualified number of Ph.D. students in this exciting field of research. So far, the participating institutions are: ETH Zurich, Freie Universität Berlin, Observatoire de la Côte d'Azur, Université de Nice-Sophia Antipolis, Università di Roma "La Sapienza", Université de Savoie. The IRAP-PhD is granted by all these institutions. Each program cycle lasts three years. The courses and related scientific activities cover a broad range of scientific topics including the mathematical and geometrical structure of space-time, relativistic field theories of fundamental interactions both at the classical and quantum levels, astronomical and astrophysical observational techniques, and the associated phenomenological and theoretical descriptions. The research style is by its own nature interdisciplinary and international. The students will take courses at all participating institutions.

This is the announcement of the fourth IRAP PhD cycle. The year 2005 signals the one hundredth anniversary of the "annus mirabilis" in which Einstein revolutionized the field of physics. In addition to the courses and research on relativistic field theory, black holes and cosmology the Graduate school will co-organize:

four "**lectiones magistrales**" in Nice in October 2005 by Remo Ruffini, Nathalie Deruelle, Yuval Ne'emann, Thibault Damour;

"**Einstein and relativistic astrophysics**", December 2005 – April 2006, Pescara, exhibition and lectures;

"**The reference frame**"
An International meeting, February 2006 in Nice;

XI Marcel Grossmann Meeting in S. Petersburg, July 2006.

ICRANet

Stampa Palombi & Partner - Roma - Giugno 2005

Cat's Eye Nebula - NGC 6543

The Courses – Each Student will have to follow 180 hours of courses during the three years of the Ph.D. program. The Courses can be chosen among the following ones. There is also the possibility to follow the courses of the other Physics, Mathematics, Astronomy and Astrophysics Ph.D. programs in each participating institution, after approval by the faculty.

CHAOTIC BEHAVIOR IN ASTROPHYSICAL SYSTEMS AND COSMOLOGY I. Lectures delivered at Pescara ICRANet Center by Prof. Vladimir Belinski

SELECTED TOPICS ON GAMMA-RAY BURST THEORY. Lectures delivered at Pescara ICRANet Center by Dr. Carlo Luciano Bianco, Dr. Luca Vitagliano, Dr. She-Sheng Xue.

PHYSICS OF GRAVITY. Lectures on the mathematical and physical foundation of general relativity held at the Università di Roma "La Sapienza" by Dr. Donato Bini and Prof. Robert T. Jantzen.

HIGH ENERGY UNIVERSE. Lectures delivered at Université de Savoie by Prof. Pascal Chardonnet.

MATHEMATICAL PROBLEMS OF GENERAL RELATIVITY THEORY. Lectures delivered at ETH Zurich by Prof. Demetrios Christodoulou

NON-LINEAR DYNAMICS AND APPLICATIONS TO ASTROPHYSICS. Lectures delivered at Université de Nice Sophie Antipolis by Prof. Pierre Coullet.

INTRODUCTION TO STRING THEORY. Lectures delivered at Université de Nice Sophie Antipolis and Pescara ICRANet Centerby Prof. Thibault Damour

THE BINARY PULSARS: THEORY AND OBSERVATIONS. Lectures delivered at Université de Nice Sophie Antipolis and Pescara ICRANet Centerby Prof. Nathalie Deruelle and Prof. Michael Kramer

THE STRUCTURE, AND DYNAMICS OF SELF-GRAVITATING SYSTEMS. Lectures delivered at Pescara ICRANet Center by Prof. Simonetta Filippi and Alonso Sepulveda

FERMI-THOMAS MODELS IN ATOMIC PHYSICS AND SELF-GRAVITATING SYSTEMS. Lectures delivered at Université de Nice Sophie Antipolis, Università di Roma "La Sapienza" and Pescara ICRANet Center by Prof. Francesco Guerra and Prof. Remo Ruffini.

CHAOTIC BEHAVIOUR IN ASTROPHYSICAL SYSTEMS AND COSMOLOGY II. Lectures delivered at Pescara ICRANet Center by Prof. Vahe Gurzadyan

SELECTED TOPICS IN RELATIVISTIC QUANTUM FIELD THEORIES. Lectures delivered at the Freie Universität in Berlin and Pescara ICRANet Center by Prof. Hagen Kleinert and Prof. Axel Pelster.

THE REFERENCE FRAME: FROM EARTH TO CMB. Lectures delivered at Université de Nice Sophie Antipolis by Prof. François Mignard.

GENERALIZED KALUZA-KLEIN THEORIES. Lectures on the mathematical and physical foundation of multidimensional unified field theories, held at the Università di Roma "La Sapienza" by Dr.Giovanni Montani.

SELECTED THEORETICAL MODELS IN ASTRONOMY AND ASTROPHYSICS. Lectures delivered at Observatoire de la Côte d'Azur by Prof. Jose Pacheco.

THEORETICAL PHYSICS. Lectures with a special emphasis on the late phases of thermonuclear evolution of stars, general relativity and cosmology delivered at Università di Roma "La Sapienza" by Prof. Remo Ruffini.

The Host Institution for the call of 2005-2006
is theUniversité de Nice
Sophia Antipolis Grand Château
28 Avenue Valrose 21
B.P. 2135
06103 NICE CEDEX 2

Application and Fellowship:
In 2005-2006 eight positions will be available, five with fellowship support. The application deadline is September 30, 2005.
See <http://www.icra.it/IRAPPhD/>.

The Faculty
Carlo Bernardini
Università di Roma "La Sapienza"
Julien Borgnino
Université de Nice-Sophie Antipolis
Pascal Chardonnet
Université de Savoie
Demetrios Christodoulou
ETH Zurich
Jacques Colin
Observatoire de la Côte d'Azur
Pierre Coullet
Université de Nice-Sophie Antipolis
Simonetta Filippi
Università "Campus Biomedico" di Roma
Giovanni Gallavotti
Università di Roma "La Sapienza"
Hagen Kleinert
Freie Universitat Berlin
Francois Mignard
Observatoire de la Côte d'Azur
Jose Pacheco
Observatoire de la Côte d'Azur
Ugo Moschella
Università della Insubria Como
Remo Ruffini (Director)
Università di Roma "La Sapienza"
Kensuke Yoshida
Università di Roma "La Sapienza"

the International Relativistic Astrophysics Ph.D.

IRAP PhD

Invitation for Applicants 2006

The field of relativistic astrophysics has become one of the fastest progressing fields of scientific development. This is due to the fortunate interaction of a vast number of international observational and experimental facilities in space, on the ground, underground, in the polar ice caps, and in the deep ocean, supported by a powerful theoretical framework based on Einstein's theory of general relativity and relativistic quantum field theory. In 1995, the International Center for Relativistic Astrophysics in Rome (ICRA) initiated an International Network of Centers in the field of Relativistic Astrophysics (ICRANet) which acquired the status of an International Organization in 2005. The ICRANet combines the research powers of leading institutions in the Americas, Australia, Asia and Europe. The coordinating center is located in the town of Pescara, Italy. In parallel with these activities, the International Relativistic Astrophysics Ph.D. Program (IRAP PhD) has been created with the goal of training a highly qualified number of Ph.D. students in this exciting field of research. So far, the participating institutions are: ETH Zurich, Freie Universität Berlin, Institut des Hautes Études Scientifiques, Observatoire de la Côte d'Azur, Université de Nice-Sophia Antipolis, Università di Roma "La Sapienza", and Université de Savoie. The IRAP-PhD is granted by all these institutions. Each program cycle lasts three years. The courses and related scientific activities cover a broad range of scientific topics including the mathematical and geometrical structure of spacetime, relativistic field theories of fundamental interactions both at the classical and quantum levels, astronomical and astrophysical observational techniques, and the associated phenomenological and theoretical descriptions. The research style is by its own nature interdisciplinary and international. The students will take courses at all participating institutions.

This is the announcement of the fifth IRAP PhD cycle. In addition to the courses and research on relativistic field theory, black holes and cosmology, the Graduate School will take part in the Eleventh Marcel Grossmann Meeting in Berlin, July 2006, in the 12th Brazilian School on Cosmology and Gravitation in September 2006, in the General Relativity Trimester at the Center Emile Borel at the Institut Henry Poincaré October-December 2006 and will also take part in topical seminars in the ICRANet centers in Pescara, at the University of Rome "La Sapienza" as well as at the University of Nice-Sophia Antipolis during all three years of this cycle.

ICRANet and ICRA

Stampa Palombi & Partner - Roma - Giugno 2006

Firestorm of Star Birth In Galaxy NGC 604

The Courses – Each student will have to follow 180 hours of courses during the three years of the Ph.D. program. There is also the possibility to follow courses from the other Physics, Mathematics, Astronomy and Astrophysics Ph.D. programs in each participating institution, after approval by the faculty. Courses can be chosen from the following list:

CHAOTIC BEHAVIOR IN ASTROPHYSICAL SYSTEMS AND COSMOLOGY I.
Lectures delivered at Pescara ICRANet Center
by Prof. Vladimir Belinski

SELECTED TOPICS ON GAMMA-RAY BURST THEORY.
Lectures delivered at Pescara ICRANet Center
by Dr. Maria Grazia Bernardini,
Dr. Carlo Luciano Bianco, Dr. Gregory Vereshaghin,
Dr. Luca Vitagliano, Dr. She-Sheng Xue.

PHYSICS OF GRAVITY.
Lectures on the mathematical and physical foundation of general relativity held at the Università di Roma "La Sapienza"
by Dr. Donato Bini and Prof. Robert T. Jantzen.

HIGH ENERGY UNIVERSE.
Lectures delivered at Université de Savoie
by Prof. Pascal Chardonnet.

MATHEMATICAL PROBLEMS OF GENERAL RELATIVITY THEORY.
Lectures delivered at ETH Zurich
by Prof. Demetrios Christodoulou

NON-LINEAR DYNAMICS AND APPLICATIONS TO ASTROPHYSICS.
Lectures delivered at Université de Nice Sophie Antipolis
by Prof. Pierre Coullet.

INTRODUCTION TO STRING THEORY.
Lectures delivered at Borel Center in Paris, at the Université de Nice Sophie Antipolis and Pescara ICRANet Center by Prof. Thibault Damour

THE STRUCTURE AND DYNAMICS OF SELF-GRAVITATING SYSTEMS.
Lectures delivered at Pescara ICRANet Center
by Prof. Simonetta Filippi and Alonso Sepulveda

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Lectures delivered at Pescara ICRANet Center
by Prof. Vahe Gurzadyan

SELECTED TOPICS IN RELATIVISTIC QUANTUM FIELD THEORIES.
Lectures delivered at the Freie Universität in Berlin and Pescara ICRANet Center
by Prof. Hagen Kleinert and Prof. Axel Pelster.

HIGH ACCURACY ASTROMETRY AND RELATIVITY. Lectures delivered at Université de Nice Sophie Antipolis by Sergei Klioner and Prof. François Mignard.

GENERALIZED KALUZA-KLEIN THEORIES.
Lectures on the mathematical and physical foundation of multidimensional unified field theories, held at the Università di Roma "La Sapienza"
by Dr. Giovanni Montani.

SELECTED THEORETICAL MODELS IN ASTRONOMY AND ASTROPHYSICS.
Lectures delivered at Observatoire de la Côte d'Azur
by Prof. Jose Pacheco.

THEORETICAL PHYSICS.
Lectures with a special emphasis on the late phases of thermonuclear evolution of stars, general relativity and cosmology delivered at University of Rome "La Sapienza"
by Prof. Remo Ruffini.

The Host Institution for the call of 2006-2007
is the Université de Nice
Sophia Antipolis Grand Château
28 Avenue Valrose 21
B.P. 2135
06103 NICE CEDEX 2

Application and Fellowship:
In 2006-2007 nine positions will be available, six with fellowship support. The application deadline is July 30, 2006.
See http://www.icra.it/IRAPPhD .

The Faculty

Julien Borgnino
Université de Nice-Sophie Antipolis
Alessandro Cacciani
Università di Roma "La Sapienza"
Pascal Chardonnet
Université de Savoie
Demetrios Christodoulou
ETH Zurich
Jacques Colin
Observatoire de la Côte d'Azur
Pierre Coullet
Université de Nice-Sophie Antipolis
Thibault Damour
IHES Bures-sur-Yvette
Simonetta Filippi
Università "Campus Biomedico" di Roma
Giovanni Gallavotti
Università di Roma "La Sapienza"
Hagen Kleinert
Freie Universitat Berlin
Olivier Michel
Université de Nice-Sophie Antipolis
Francois Mignard
Observatoire de la Côte d'Azur
Jose Pacheco
Observatoire de la Côte d'Azur
Remo Ruffini (Director)
Università di Roma "La Sapienza"

the International Relativistic Astrophysics Ph.D.

IRAP PhD

Invitation for Applicants 2007

The field of relativistic astrophysics has become one of the fastest progressing fields in science.
This is due to the coordinated interaction of a vast number of international projects of observations and experimental facilities in space, on the ground, underground, in the polar ice caps, and in the deep oceans. The fortunate circumstance occurs in these years of a considerable support to this endeavor by a powerful theoretical framework based on Einstein's theory of general relativity and relativistic quantum field theories.
Many international collaborations have been dedicated to the development of new experimental and observational facilities. Since 1995, the International Center for Relativistic Astrophysics in Rome (ICRA) initiated an International Network of Centers in the field of Relativistic Astrophysics (ICRANet) dedicated to foster international collaboration in the theoretical field of Relativistic Astrophysics. Since 2005 ICRANet has acquired the status of International Organization with a coordinating Center in Pescara (Italy). ICRANet combines the research powers of leading institutions in the Americas, Asia and Europe. Prof. Remo Ruffini is the ICRANet Director, Prof. Fang Li Zhi President of the Board and Prof. Riccardo Giacconi Chairmen of the Scientific Committee.
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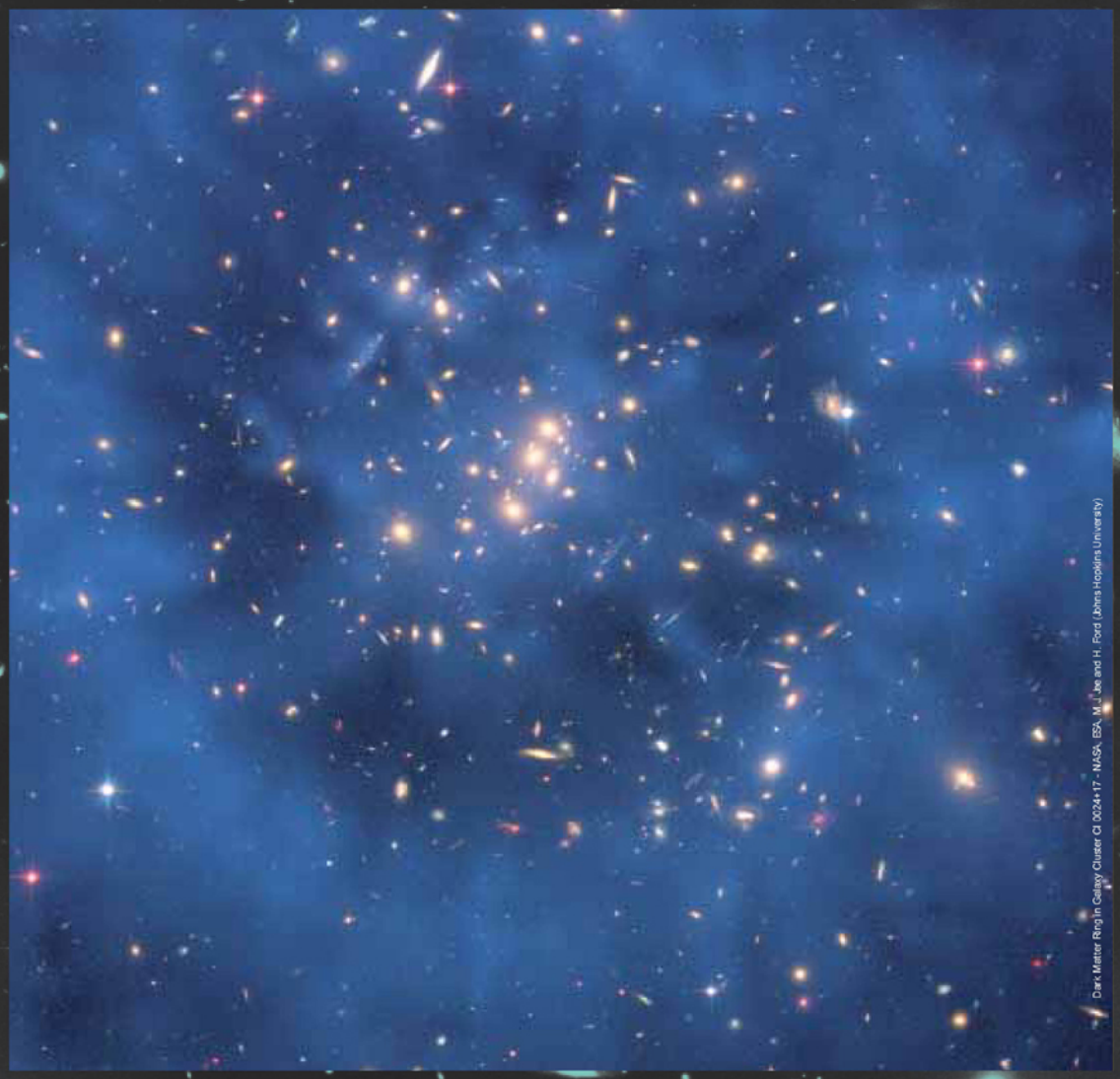
This is the announcement of the sixth IRAP Ph.D. cycle. In addition to the courses and research the graduate school will take part in a series of seminars and workshops including the Italian-Korean meetings, the Italian-Chinese meetings and the Stuckelberg Meeting in Pescara and at the University of Rome "La Sapienza", the Bego Meetings in Nice and the XII Marcel Grossmann meeting in Paris. Distinguished visitors will present lectures including Massimo Della Valle, Prof. Jurgen Ehlers, Prof. Roy Kerr, Prof. Gerard 't Hooft, Alexei Starobinsky.



Dark Matter Ring In Galaxy Cluster Cl 0024+17 - NASA, ESA, M.J. Jee and H. Ford (Johns Hopkins University)

The Courses – Each student will have to follow 180 hours of courses during the three years of the Ph.D. program. There is also the possibility to follow courses from the other Physics, Mathematics, Astronomy and Astrophysics Ph.D. programs in each participating institution, after approval by the faculty. Courses can be chosen from the following list

Many Body Solutions in the Einstein-Maxwell Equations
Held at ICRANet Pescara by Prof. V. Belinski

Selected Topics on Gamma-Ray Burst Theory
Held at ICRANet Pescara by Drs. C.L. Bianco, G. Vereshaghin, and S-S. Xue

Mathematical Foundation of General Relativity
Held at the Università di Roma "La Sapienza" by Dr. D. Bini and Prof. R.T. Jantzen

Classical and Relativistic Celestial Mechanics
Held at the Università di Roma "La Sapienza" by Prof. D. Boccaletti

High Energy Universe
Held at Université de Savoie by Prof. P. Chardonnet

Evolution and Explosion of Massive Stars
Held at Università di Roma "La Sapienza" by Profs. A. Chieffi and M. Limongi

Mathematical Problems of General Relativity
Held at ETH Zurich by Prof. D. Christodoulou

Non-Linear Dynamics and Astrophysics
Held at the Université de Nice Sophia Antipolis by Prof. P. Coullet

Theory of Binary Neutron Stars
Held at the Université de Nice Sophia Antipolis by Prof. T. Damour

Theoretical Studies on Phase Transitions and Critical Phenomena
Held at Università di Roma "La Sapienza" by Prof. C. Di Castro

The Structure of Self-Gravitating Systems
Held at ICRANet Pescara by Profs. S. Filippi and A. Sepulveda

Fermi-Thomas Models in Atomic and in Gravitation Physics
Held at Università di Roma "La Sapienza" by Profs. S. Popov and R. Ruffini

Chaos in Astrophysics and Cosmology
Held at ICRANet Pescara by Prof. V. Gurzadyan

Selected Topics in Relativistic Quantum Field Theories
Held at the Freie Universität in Berlin by Prof. H. Kleinert

High Accuracy Astrometry and Relativity
Held at Université de Nice Sophia Antipolis by Profs. S. Klioner and F. Mignard

Generalized Kaluza-Klein Theories
Held at the Università di Roma "La Sapienza" by Dr. G. Montani

Selected Theoretical Models in Astronomy and Astrophysics
Held at Observatoire de la Côte d'Azur by Prof. J. Pacheco

Theoretical Physics
Held at University of Rome "La Sapienza" by Prof. R. Ruffini

The Host Institution for the call of 2007-2008 is the Université de Nice Sophia Antipolis Grand Château 28 Avenue Valrose 21 - B.P. 2135 06103 NICE CEDEX 2

Application and Fellowship:
In 2007-2008 nine positions will be available, six with fellowship support.
The application deadline is August 31, 2007.
See http://www.icra.org.
Information: Berti Armida - tel.+390649914254 – e-mail: secretariat-irapphd@icra.it

The Faculty
Carlo Luciano Bianco
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Dino Boccaletti
Università di Roma La Sapienza
Julien Borgnino
Université de Nice-Sophia Antipolis
Pascal Chardonnet
Université de Savoie
Demetrios Christodoulou
ETH Zurich
Jacques Colin
Observatoire de la Cote d'Azur
Pierre Coullet
Université de Nice-Sophia Antipolis
Thibault Damour
IHES Bures-sur-Yvette
Carlo Di Castro
Università di Roma "La Sapienza"
Simonetta Filippi
Campus Bio-medico Roma and ICRANet
Hagen Kleinert
Freie Universität Berlin
Olivier Michel
Université de Nice- Sophia Antipolis
Francois Mignard
Observatoire de la Cote d'Azur
Giovanni Montani
ENEA and ICRANet
José Pacheco
Observatoire de la Côte d'Azur
Remo Ruffini (Director)
Università di Roma La Sapienza and ICRANet
Xue She Sheng
ICRANet

Stampa Palombi & Partner - Roma - Maggio 2007

Observatoire de la Côte d'Azur

veritas iustitia libertas — Freie Universität Berlin

ETH — Eidgenössische Technische Hochschule Zürich, Swiss Federal Institute of Technology Zurich

Université de Savoie Chambery Annecy

La Sapienza — Università degli Studi di Roma

Université Nice Sophia Antipolis

Institut des Hautes Études Scientifiques

university of ferrara — 600 years of looking forward.

The International Relativistic Astrophysics Ph.D.

IRAP PhD

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Many international collaborations have been dedicated to the development of new experimental and observational facilities. Since 1995, the International Center for Relativistic Astrophysics in Rome (ICRA) initiated an International Network of Centers in the field of Relativistic Astrophysics (ICRANet) dedicated to foster international collaboration in the theoretical field of Relativistic Astrophysics. Since 2005 ICRANet has acquired the status of an International Organization with a coordinating Center in Pescara (Italy).

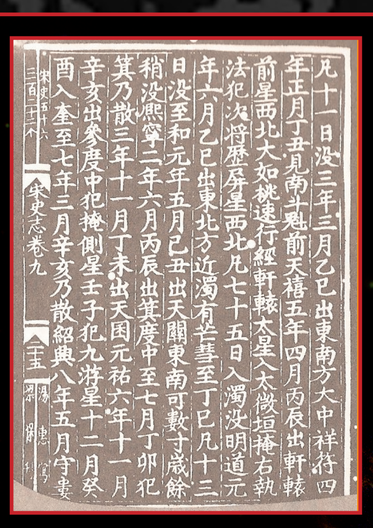
ICRANet combines the research powers of leading institutions in the Americas, Asia and Europe. Prof. Remo Ruffini is the ICRANet Director, Prof. Fang Li Zhi is the President of the Board and Prof. Riccardo Giacconi is the Chairman of the Scientific Committee.

The International Relativistic Astrophysics Ph.D. Program (IRAP PhD) is the academic branch of ICRANet, created with the goal of training a select number of highly qualified Ph.D. students in this exciting field of research. So far, the participating institutions are: ETH Zurich, Freie Universität Berlin, Università di Ferrara, Università di Roma "La Sapienza", Université de Nice Sophia Antipolis, Université de Savoie. These six Universities jointly deliver the Ph.D. The Institut Hautes Etudes Scientifiques and l'Observatoire de la Côte d'Azur also participate. Each cycle lasts three years. The courses and related scientific activities take place in all participating institutions. They cover a broad range of scientific topics including the mathematical and geometrical structure of space-time, relativistic field theories of fundamental interactions both at the classical and quantum levels, astronomical and astrophysical observational techniques, and the associated phenomenological and theoretical descriptions.

This is the announcement of the seventh IRAP Ph.D. cycle. In addition to the courses and research the graduate school will take part in a series of seminars and workshops including the Italian-Korean Meetings, the Italian-Chinese Meetings and the Stuckelberg Meetings in Pescara and at the University of Rome "La Sapienza", the set of meetings celebrating the 2009 Year of Astronomy "The Stars, the Galaxy, the Cosmos for General Relativity", which includes the Bego Meetings in Nice, the Sobral Meeting in Brazil, the XII Marcel Grossmann Meeting in Paris, the Xu Guang-Qi Meeting in Shanghai. Distinguished visitors will present lectures including Prof. David Arnett, Prof. Massimo Della Valle, Prof. Walter Greiner, Prof. Roy Kerr, and Prof. Gerard 't Hooft.

ICRANet and ICRA

Stampa Palombi & Partner - Roma - giugno 2008



A Giant Hubble Mosaic of the Crab Nebula - Credit: NASA, ESA, J. Hester and A. Loll (Arizona State University)

Chandra observations of the Crab pulsar
Credit: NASA/CXC/ASU/J.Hester et al.

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Many Body Solutions in the Einstein-Maxwell Equations
Held at ICRANet Pescara by Prof. V. Belinski

Selected Topics on Observations in X and Gamma-ray Astronomy, including Gamma-Ray Bursts
Held at ICRANet Pescara by Profs. L. Amati and F. Frontera

Selected Topics on X and Gamma-ray Astrophysics
Held at ICRANet Pescara by Prof. F. Aharonian

Selected Topics on Gamma-Ray Burst Theory
Held at ICRANet Pescara by Drs. C.L. Bianco, G. Vereshchagin, and S.-S. Xue

Mathematical Foundation of General Relativity
Held at the Università di Roma "La Sapienza" by Dr. D. Bini and Prof. R.T. Jantzen

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Evolution and Explosion of Massive Stars
Held at Università di Roma "La Sapienza" by Profs. A. Chieffi and M. Limongi

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Held at ETH Zurich by Prof. D. Christodoulou

Non-Linear Dynamics and Astrophysics
Held at the Université de Nice Sophia Antipolis by Prof. P. Coullet

Theory of Binary Neutron Stars
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Held at Università di Roma "La Sapienza" by Profs. W. Greiner, S. Popov and R. Ruffini

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Generalized Kaluza-Klein Theories
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Selected Theoretical Models in Astronomy and Astrophysics
Held at Observatoire de la Côte d'Azur by Prof. J. Pacheco

Theoretical Physics
Held at University of Rome "La Sapienza" by Prof. R. Ruffini

The Host Institution for the call of 2008-2009
is the Université de Nice Sophia Antipolis Grand Château
28 Avenue Valrose 21 - B.P. 2135
06103 NICE CEDEX 2

Application and Fellowships
In 2008-2009 ten positions will be available, seven with fellowship support.
The application deadline is August 31st, 2008.
See http://www.icra.it/ and http://www.icranet.org/.
For information contact Berti Armida,
tel. +390649914254,
e-mail: secretariat-irapphd@icra.it

The Faculty
Jean Arnaud
Université de Nice-Sophia Antipolis
Carlo Luciano Bianco
Università di Roma "La Sapienza" and ICRANet
Dino Boccaletti
Università di Roma "La Sapienza"
Pascal Chardonnet
Université de Savoie
Demetrios Christodoulou
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Université de Nice-Sophia Antipolis
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Filippo Frontera
Università di Ferrara
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Freie Universität Berlin
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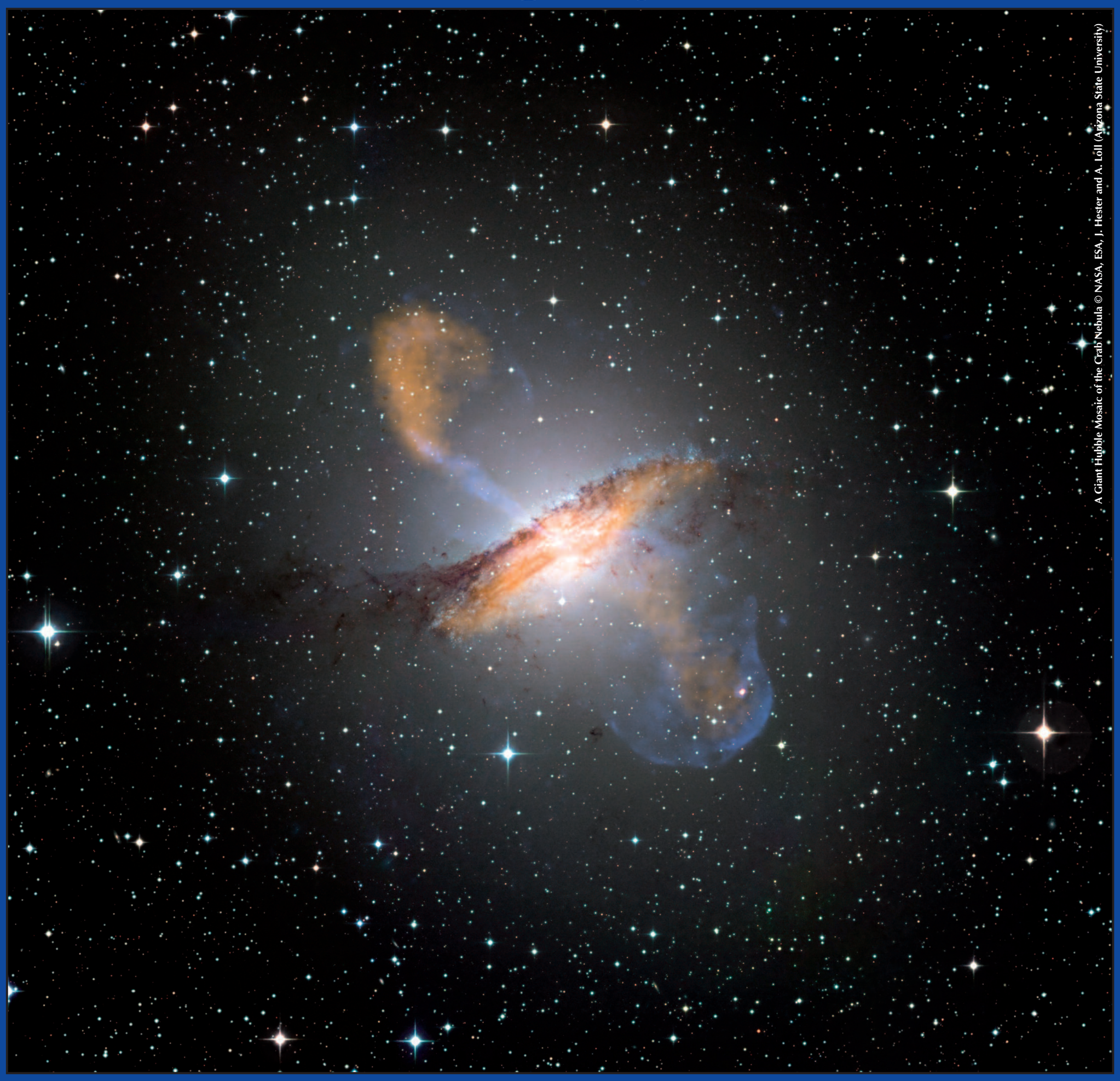
ICRANet

the International Relativistic Astrophysics Ph.D.

IRAP PhD

INVITATION FOR APPLICANTS 2009

Following the successful scientific space missions by the European Space Agency (ESA) and the European Southern Observatory (ESO) in Chile, as well as the high-energy particle activities at CERN in Genève, we have created a Ph.D. program dedicated to the formation of scientists in the field of relativistic astrophysics. The students of such a program will lead the theoretical developments of one of the most active fields of research, based on the above observational and experimental facilities. This program needs expertise in the most advanced topics of mathematical and theoretical physics, and in relativistic field theories. It requires the ability to model the observational data received from the above facilities, as well as all the basic knowledge in astronomy, astrophysics and cosmology. This activity is necessarily international, no single university can cover the broad expertises. From this, the proposed program of the IRAP Ph.D., in one of the youngest and most dynamical French universities, pole of research and teaching in the Euro-Mediterranean region (PRES): the University of Nice. It benefits from the presence of the astrophysics research institute of Observatoire de la Côte d'Azur involved in relativistic and non-photonic astrophysics as well as the presence of Tartu Observatory. The participation of the Freie Universitaet Berlin and of the Einstein Institute in Potsdam offers the possibility of teaching in relativistic field theories at the highest level. The University of Savoie offers the link to the particle physics at CERN. The activities at the University of Rome, at Stockholm University and at ICRANet offer teaching programs in all the fields of relativistic astrophysics, including cosmology, the physics of gravitational collapse, gamma-ray bursts, and black hole physics. Finally, the University of Ferrara will be present with lectures and researches in the topics they have pioneered such as X-ray astrophysics and observational cosmology. Through ICRANet the extra-European connections with Brazil, China and India will be guaranteed: in China, with the Shanghai Observatory of the Chinese Academy of Science, studying the formation and evolution of large-scale structure and galaxies; in India, with the Indian Centre for Space Physics (ICSP), renowned for its research on compact objects as well as on solar physics and astrochemistry; in Brazil, with ICRA-BR at CBPF, where a successful program of research and teaching in relativistic astrophysics has been established in recent years.



A Giant Hubble Mosaic of the Crab Nebula © NASA, ESA, J. Hester and A. Loll (Arizona State University)

The Courses – Each student will have to follow 180 hours of courses during the three years of the Ph.D. program. There is also the possibility to follow courses from the other Physics, Mathematics, Astronomy and Astrophysics Ph.D. programs in each participating institution, after approval by the faculty. Courses can be chosen from the following list:

CORE LECTURES

ULTRA HIGH ENERGY GAMMA RAY SOURCES
Felix AHARONIAN (ICRANet & Max Planck)

THE APPROACH TO THE SINGULARITY
Vladimir BELINSKI (ICRANet)

RELATIVISTIC EFFECTS IN GRBS
Carlo BIANCO (ICRANet)

ACCRETIONS ON BLACK HOLES AND NEUTRONS STARS
Sandip CHAKRABARTI
(Indian Centre for Space Physics)

PARTICLE PHYSICS APPLIED TO ASTROPHYSICS
Pascal CHARDONNET (Savoie University)

EXOBIOLOGY
Sandip CHAKRABARTI
(Indian Centre for Space Physics)

GENERAL RELATIVITY
Thibault DAMOUR (ICRANet & IHES)

LARGE SCALE STRUCTURE OF THE UNIVERSE
Jaan EINASTO (ICRANet & Tartu Observatory)

SIGNAL TREATMENT
Andrea FERRARI (Nice University)

X-RAYS AND GAMMA RAYS ASTRONOMY
Filippo FRONTERA (Ferrara University)

X RAYS CLUSTERS
Riccardo GIACCONI (ICRANet)

PLANETOLOGY
Tristan GUILLOT
(Observatoire de la Côte d'Azur)

FORMATION OF GALAXIES
Ypeng JING (Shanghai Observatory)

ON THE KERR SOLUTION
Roy KERR (ICRANet)

RELATIVISTIC FIELD THEORY
Hagen KLEINERT
(Freie Universität Berlin)

PLANETOLOGY
Alessandro MORBIDELLI
(Observ. de la Côte d'Azur)

DEVELOPMENT ON BKL WORK
Hermann NICOLAI
(Einstein Institute Postdam)

NON SINGULAR COSMOLOGY
Mario NOVELLO (CBPF Brazil)

EXTRAGALACTIC ASTROPHYSICS
José PACHECO
(Observatoire de la Côte d'Azur)

GRAVITATIONAL WAVES
Tania REGIMBAU
(Observatoire de la Côte d'Azur)

SINGULARITIES AND GENERAL RELATIVITY
Kjell ROSQUIST
(Stockholm University)

BLACK HOLES AND FUNDAMENTAL PHYSICS
Remo RUFFINI
(ICRANet & Roma La Sapienza)

THERMALIZATION AND COLLECTIVE EFFECTS
Gregory VERESHACING (ICRANet)

GRAVITATIONAL WAVES
Jean-Yves VINET
(Observatoire de la Côte d'Azur)

ULTRA RELATIVISTIC ELECTRON POSITRON PLASMA
She-Sheng XUE (ICRANetT)

The Host Institution for the call of 2009-2010
is the Université de Nice
Sophia Antipolis Grand Château
28 Avenue Valrose 21 - B.P. 2135
06103 NICE CEDEX 2

Applications and Fellowship:
In 2009-2010 ten positions will be available, six with fellowship support.
The application deadline is September 15, 2009.
See http://www.icra.it and http://www.icranet.org

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Jean Arnaud
Université de Nice-Sophia Antipolis
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Donato Bini
CNR – Istit. per Applicaz. del Calcolo "M. Picone"
Pascal Chardonnet
Université de Savoie
Christian Cherubini
Università "Campus Biomedico" di Roma
Demetrios Christodoulou
ETH Zurich
Jacques Colin
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ICRANet and ICRA

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