

2012/2013 CALL FOR APPLICATIONS

PhD Level Courses ("Corsi di dottorato di ricerca"), Roma Tre University

(Doctorates, Doctoral Schools)

THE PRESIDENT

In accordance with

Law 09.05.89, n. 168;

In accordance with

Statute of the Roma Tre University;

In accordance with

Article 4 of Law 03.07.98, n. 210;

In accordance with

the rules about PhD courses ("corsi di dottorato di ricerca") provided by the D.M. 30.04.99, n. 224; **In accordance with**

the rules of Roma Tre Doctorates enacted by D.R. n. 01/2005;

In accordance with

the decisions adopted by the Academic Senate (14.06.12);

In accordance with

the Administrative Director

DECREES

Article 1

Roma Tre University (Rome, Italy), hereafter referred as "Roma Tre", opens a competition for the access of foreign students to the Roma Tre "Corsi di dottorato di ricerca". All these courses are three academic years long (2012/2013 to 2014/2015, starting 2013, January 01) and confer the degree "Dottore di Ricerca", which is equivalent to the "Doctor Philosophiae" (PhD) degree.

The access is possible to DOCTORATES and DOCTORAL SCHOOLS, providing positions with fellowship and positions without fellowship according to the following descriptions:

DOCTORATE: AMERICAN STUDIES

1 position without fellowship (fees requested: € 520 per year)

Course Coordinator: Prof. Maria Cristina GIORCELLI (giorcell@uniroma3.it – rinaldi@uniroma3.it)

The Doctorate in American Studies is the only one in Italy with the following characteristics. Its main fields of study are: the literatures, arts, history, politics, and philosophies of the various cultural and linguistic areas of the American Continent. Its goal is to equip future Doctors with the competences needed to work in the following areas:

University research, cultural centers, publishing houses, diplomacy, ministries, foreign offices, journals, television.

Several of its past Doctors have won University posts or found employments either in this country or abroad. The Doctorate has been evaluated as 'excellent' by a foreign team of researchers.

DOCTORAL SCHOOL IN BIOLOGY
"Molecular and Cellular Sciences"

1 position with fellowship (€ 13.638,47 - gross amount per year)

Course Coordinator Prof. Paolo Mariottini (mariotpa@uniroma3.it – dott_bio@uniroma3.it)

The Doctoral Course in "Biomolecular and Cellular Sciences" (acronym BCS) within the Doctoral School in Biology is held at the Department of Biology, University Roma Tre, Viale G. Marconi 446, 00146 Rome, Italy. The scientific interest of the BCS section encompasses fundamental biological disciplines: Molecular Biology, Biochemistry, Cell biology, Genetics, Microbiology, Physiology, Plant Biotechnology, Virology and Didactics Research. Research is primarily devoted to understand the basic biology of animals, plants and microorganisms, with focused interests concerning cellular and molecular function and regulation, and biotechnology applications. Within the Doctoral School, students will benefit from top-level basic research as well as close cooperation between basic and applied research. Doctoral theses are carried out in laboratories characterized by multi-disciplinary research approaches, and students benefit from the expertise and technical platforms developed for basic science investigations. Students work in a creative environment characterized by a strong integration and cooperation among different biological disciplines. The Doctoral course is aimed at developing professional skills and specialized knowledge in students, taking into account their future career in biological research fields.

1. Research areas The Ph.D. course consists of both classes and practical research training in a selected laboratory, under the direct supervision of a member of the Doctoral School. Areas and reference people are listed.

1.a. Biochemistry, Biophysics, Bioinformatics Structure-function relationships in biological macromolecules. Protein structure and function prediction. Synthetic biology and minimal cell models. Biotechnology and applied research on macromolecules. Protein design. Reference people: Prof Giovanni Antonini (e-mail giovanni.antonini@uniroma3.it), Prof Pier Luigi Luisi (e-mail luisi@uniroma3.it), Dr Fabio Polticelli (e-mail polticelli@uniroma3.it).

1.b. Cellular Biology Role of Nitric Oxide (NO) pathway in different cellular lines and model organisms, in standard and experimental conditions. Regulation of NO production from housekeeping and inducible enzymes. NO and target proteins interactions. Role of nitrosative and oxidative stress during neurodegeneration. Reference people: Prof Marco Colasanti (e-mail colasant@uniroma3.it), Dr Tiziana Persichini (e-mail persichi@uniroma3.it).

1.c. Genetics In vitro analysis of antimutagenic/anticarcinogenic activity of natural agents on mammalian cells: cell cycle and intercellular modulation of Gap junctions, DNA damage and apoptosis. Endogenous and exogenous DNA damage and repair in human cells: role of polymorphism of DNA repair on individual susceptibility. Reference person: Prof Renata Cozzi (e-mail cozzi@uniroma3.it).

1.d. Microbiology Molecular genetics of bacterial pathogens. Shigella evolution from the ancestral non pathogenic Escherichia coli. Role of antivirulent genes interfering with pathogenic mechanisms. Reference person: Prof Maria Assunta Casalino (casalino@uniroma3.it).

1.e. Molecular Biology Regulation and expression of genes coding for specific oxidases and acetyltransferases involved in metabolic pathways: production, characterization and subcellular localization of the corresponding recombinant proteins. Molecular phylogenetic reconstruction in animal models. Reference people: Prof Paolo Mariottini (e-mail mariotpa@uniroma3.it), Dr Manuela Cervelli (e-mail cervelli@uniroma3.it).

1.f. Plant Physiology and Biotechnology Molecular and biochemical characterization, physiological roles and applied biotechnology of plant enzymes involved in metabolic pathways. Their role during development and differentiation, and to stress response. Reference people: Prof Riccardo Angelini (e-mail angelini@uniroma3.it), Dr Paraskevi Tavladoraki (e-mail tavlador@uniroma3.it).

1.g. Virology Virus-cell interactions during retroviral infection, innate antiviral immunity and viral immunoevasion; biology of type I interferons, cell growth regulatory cytokines, differentiation and antiviral and immune response. Reference person: Prof Elisabetta Affabris (e-mail affabris@uniroma3.it).

1.h. Didactics research Scientific teaching and learning; methodological hypothesis definition and material production/validation for undergraduate

and graduate teachers training and updating; development and diffusion of educational methods based on active and cooperative learning. Reference person: Prof Milena Bandiera (e-mail bandiera@uniroma3.it). 2. Partnerships and international activities Students will have the opportunity of spending a 1-year period to carry out part of their research activity in a selected foreign laboratory, preferably selected within EU countries, with recognized experience in the student's investigation field. The tutor can designate an external co-tutor (either from Italy or any other EU country) among recognized scientific authorities in the student's investigation field. All students are strongly recommended to spend at least 3 months in a foreign (EU) laboratory to achieve the label of "Doctor Europaeus" (The European Doctorate refers basically to a label attachable to the Research Doctorate degree to be conferred by the University, when the following four conditions have been fulfilled: a) the doctoral thesis defense will be accorded if at least two professors from two higher education institutions of two European countries, other than the one where the doctoral thesis will be defended, have given their positive judgment concerning the manuscript; b) at least one member of the jury should come from a higher education institution in European countries, other than the one where the doctoral thesis will be defended; c) part of the defense must take place in one of the official languages, other than the one(s) of the country where the doctoral thesis will be defended; d) the doctoral thesis must have been partly prepared as a result of a period of research of at least one trimester spent in another European country). 3. Documents for application and selection criteria Candidates will be selected on the basis of: • (mandatory) university (or equivalent) degree • (mandatory) abstract of the final thesis • (mandatory) list of passed examinations • (mandatory) curriculum vitae et studiorum • (mandatory) a proposed research project • (mandatory) at least three reference letters provided and signed by relevant members of the international scientific community, relating to the candidate's chosen course; • (if any) additional document and/or publication (including GRE - Graduate Record Examination - test) that the candidate deems worthy of consideration, including associations to research institutions (MAX 5 documents). 4. Duration of the course and laboratory attendance The degree of Doctor in "Biomolecular and Cellular Sciences" is obtained after 3 (maximum 4 years) of doctoral studies. At the end of each year (around December) students will be asked to present their results to be admitted to the following year in the form of both a written and an oral presentation. The thesis must be prepared in English and should be accompanied by published or "in press" scientific articles produced by the student during the doctoral course. Although with some flexibility, access to the final dissertation requires the publication in the preceding 3 years of at least 3 articles in international (ISI indexed) journals, with at least 1 article as first author. Daily attendance of courses and laboratories is required for ca. 5 days a week and ca. 11 months a year (different arrangements can be agreed with the supervisor). 5. Salary and general information The net yearly salary is ca. 13,600 euros (i.e., ca. 1,100 euros per month for a duration of 36 months). Upon your request and subsequent approval by the Doctoral School Board, the doctoral student can be allowed to spend up to 12 months in a foreign laboratory (to be agreed with his/her supervisor) with an extra-salary of approx. 550 euros per month. Travel, accommodation in Rome, meals and transportation are at the student's expenses. The University Research Office and the student's supervisor will assist him/her in obtaining the immigration visa, but students are asked to travel to Rome at their own expenses (unless differently arranged with his/her supervisor). Few more practical information are: The cost of life in Rome is quite high, but an accommodation in a rented room can be easily found at ca. 350 euros per month. The cost for public transportation in Rome is quite cheap (ca. 200 euros per year, including both subway and buses). Cost of meals is highly variable (ca. 5 euros in the University canteen or in a fast-food restaurant).

Specific information will be soon available at the following URLs:

<http://host.uniroma3.it/uffici/ricerca/default.asp> <http://www.uniroma3.it/page.php?page=Dottorato>
<http://host.uniroma3.it/dipartimenti/biologia/>

DOCTORAL SCHOOL IN BIOLOGY
"Biology applied to human health"

2 positions with fellowship (€ 13.638,47 - gross amount per year)

Course Coordinator. Prof. Paolo Visca (visca@uniroma3.it – dott_bio@uniroma3.it)

The scientific interest of the doctoral school section "Biology applied to human health" encompasses fundamental biological disciplines, including Biochemistry, Genetics, Immunology, Microbiology, Microbial biotechnology, Pharmacology, Physiology, Pathology and Virology. The board of supervisors is composed of 16 internationally recognized experts specialised in the above disciplines (names of supervisors are listed in the web site of the Department of Biology of Roma Tre University: http://europa.uniroma3.it/biologia/dottorato_docenti.aspx?lang=en). The programme is centred on the biomedical research, with particular regard to the biological basis of emerging and/or rare pathologies, including infectious, genetic, metabolic and degenerative diseases. The student will benefit from the existence, within the doctoral programme, of areas of excellence in fundamental research as well as of the close cooperation existing between fundamental and medical research. Doctoral theses are prepared in laboratories with strong biomedical imprinting, in general involving multi-disciplinary research approaches, and benefit from the expertise and technical platforms developed by the fundamental sciences. Students will work in a creative environment with strong integration and cooperation between biomedical disciplines, often in collaboration with clinical centres. The course is aimed to developing professional skills and specialised knowledge for future career in of biomedical research. Research areas for BASU are: 1.a. Biochemistry - Structure-function relationships of microbial proteins related to infectivity and pathogenicity; Development of new methods for the determination of drugs, metabolites and infectious agents in biological fluids; Hemoproteins; Albumin. 1.b. Cell biology and pathology - Role of oxidative and nitrosative stresses in neurodegenerative diseases; Development of cellular and animal models to study the pathogenesis of neurodegenerative disorders; Role of HIV proteins in immune evasion, cell death and neurodegeneration; Identification of cell markers of neurodegenerative diseases. 1.c. Genetics - Molecular bases of DNA repair processes in rare human genetic disorders; Translational approaches in radio- and chemo-therapy including : a) biological effects of ionizing radiation for treatment planning in adrontherapy and for assessment of risk in space; b) cellular and molecular markers of apoptosis induction and mitotic catastrophe in cells exposed to new antineoplastic molecules. 1.d. Microbial biotechnology - Development, screening, and characterization of compounds and macromolecules endowed with biomedical and/or pharmaceutical interest; Characterization of bioactive compounds of microbial origin and of new antimicrobial agents. 1.e. Microbiology - Active transport mechanisms and their role in host-bacterium interactions; Regulation of microbial virulence genes through genomic, transcriptomic and proteomic approaches; Molecular and genetic basis of bacterial pathogenicity and of resistance to antimicrobial agents and to environmental stresses; Molecular typing and genomic evolution of bacterial pathogens. 1.f. Physiology - Relationship between oxidative stress, ageing, cholesterol metabolism and hormones; Effects of natural and synthetic compounds on estrogen receptor alpha-dependent cell proliferation; Role of endocrine disruptors on estrogen receptor activities: putative gender-related susceptibility; Study of the antioxidant activity of diet-derived and synthetic compounds; Role of endocrine disruptors on differentiation and potential protective effects of diet. 1g. Pharmacology: Behavioral and neurochemical effects of neuroactive drugs; Developmental neurotoxicity of drugs of abuse and environmental chemicals; Animal models of cognitive and emotional disorders as screening to identify novel pharmacological approaches to treat neuropsychiatric diseases; Parmacokinetic studies: drug absorption, distribution, metabolism and excretion; Drug binding to plasma proteins. After web-based application, candidates are recommended to get in touch Skype with the coordinator paolo.visca (Prof. Paolo Visca) for preliminary contacts and for any question regarding the course. Applications will be considered only if complete in any part.

DOCTORAL SCHOOL IN BIOLOGY

"Biodiversity and analysis of ecosystems"

1 position with fellowship (€ 13.638,47 - gross amount per year)

Course Coordinator: Prof. Marco Alberto Bologna (bologna@uniroma3.it – dott_bio@uniroma3.it)

The Ph.D. on "Biodiversity and ecosystems analysis" is primarily aimed to develop basic and applied researches in ecological, evolutionary and phylogenetic aspects. In particular, the main topics of research concern: (a) Systematics and phylogeny based on either morphological approach (cladistics, phenetics, geometric morphometric analysis, SEM) and molecular techniques. (b) Biogeography of single taxonomic units (phylogeography) and of areas (inventories, atlases, chorological analyses, etc.), or theoretical Biogeography, and applications to biodiversity conservation. (c) Ecology of single species and communities, with applications to management of terrestrial and freshwater ecosystems. (d) Ethnobiology, i.e. the study of the biological knowledge in the cultural heritage with applications to management. (e) Biology applied to the conservation of cultural heritage. The board of supervisors is composed of 12 internationally recognized experts specialized in the above disciplines (names of supervisors are listed in the web site of the Department of Environmental Biology of Roma Tre University:

http://europa.uniroma3.it/biologia/dottorato_docenti.aspx?lang=en).

DOCTORATE: COMPARATIVE CULTURES AND LITERATURES

1 position with fellowship (€ 13.638,47 - gross amount per year)

Course Coordinator: Prof. Franca Ruggieri (ruggieri@uniroma3.it – veraldi@uniroma3.it)

The PhD programme in Comparative Cultures and Literatures at the Department of Comparative Literatures is intended to investigate responses to those processes of transformation which characterize the whole system of the production and the transmission of culture. This has a particularly strong impact on Humanities. There is thus an awareness that the PhD programme has to be based upon a well-defined and well considered response to the new challenges posed by inter-cultural issues and the transversal nature of knowledge. Indeed, doctorate studies in Comparative Cultures and Literatures intend to privilege an interdisciplinary editorial view of linguistic phenomena and literary texts. Language and literature are investigated through various methodological approaches and according to various modes of communication. Therefore, the main aim of the programme is to promote, develop and transmit a trans-disciplinary and multimedial dimension, represented by a prime insistence on "textual competence". This is explored from both literary and linguistic/philological viewpoints, thus providing the critical tools necessary to investigate other forms of communication

DOCTORAL SCHOOL ON CULTURE AND CHANGE OF CITIES AND REGIONS

"Cinema In Relation To Other Media And Arts"

1 position without fellowship (no fees requested)

Course Coordinator: Prof. Veronica PRAVADELLI (pravadel@uniroma3.it)

The program addresses a whole set of issues concerning the study of cinema in relation to other media and arts. It focuses especially on theoretical and methodological lines of inquiry. Such issues are explored through a series of Seminars/lectures with Visiting Professors, from Italy and abroad as well as with Roma Tre Faculty. Students also take part in the Department's activities such as conferences, seminars, etc. Students can also attend MA classes in cinema and media.

DOCTORAL SCHOOL ON CULTURE AND CHANGE OF CITIES AND REGIONS "Territorial policies and local project"

1 position without fellowship (no fees requested)

Course Coordinator: Prof. Paolo Avarello (avarello@uniroma3.it – porcari@uniroma3.it)

The Doctoral Program "Territorial policies and local project" was established in 1997 at the department of Urban Studies, Roma Tre University. The PhD Program is addressed to Italian and foreign students. A basic knowledge of the Italian language is required. The approach of the PhD Program is interdisciplinary: research is carried mostly at the crossroad between urban design and urban policies. The aim is to train researchers able to both analyse processes of change and to evaluate policies through the integration of different methodologies and fields of study. The PhD program takes advantage of the close cooperation with other national and foreign PhD programmes; students are invited to spend a semester abroad.

The introductory courses offered during the first year debate methodological issues and some of the core subjects. The courses are focused on four main subjects:

- urban and planning theories, in a critical and comparative approach to different fields (innovation in planning theory, spatial and land use planning, comparative planning system, relationship between planning theory and practice);
- urban policies, and their link to issues of governance and government in specific sectors (welfare, housing, land use, mobility and infrastructures, built environmental quality,...);
- urban design, focusing upon public space design and management; the design features of planning, morphological patterns, the social use of space,
- processes of contemporary cities transformations in the last twenty years.

DOCTORAL SCHOOL IN EARTH SCIENCE

1 position with fellowship (€ 13.638,47 - gross amount per year)

Course Coordinator: Prof. Domenico Cosentino (cosentin@uniroma3.it - dipartimento.scienzegeologiche@uniroma3.it)

Magnetostratigraphy of Plio-Pleistocene continental basins in Central and Northern Apennines

In the last few years it has been widely demonstrated that both marine and continental sedimentary units can be affected by significant magnetic overprint, related to the presence of authigenic ferrimagnetic iron sulphides (greigite). These findings have questioned the reliability of magnetostratigraphic results in greigite-bearing intervals and their use for age calibration in many stratigraphic sequences. The Plio-Pleistocene continental units of intermountain extensional basins of Central and Northern Apennines have been also investigated by magnetostratigraphy since the last 30 years. Magnetostratigraphy has been largely used to constrain the age of the stratigraphic sequences from various of these sedimentary intermountain basins and most of their stratigraphy is anchored to magnetostratigraphic results. Anyway, the problems linked to the occurrence of ferrimagnetic iron sulfides, and to a variable magnetic mineralogy as a whole, have not been considered in the due detail so far. The main purpose of the PHD thesis is to investigate representative stratigraphic sections from different sedimentary basins using an integrated approach based on up-to-date magnetostratigraphy, magnetic mineralogy and biostratigraphy techniques. The main goals of the project are: (1) to improve our knowledge on the mechanisms of acquisition of magnetic remanence in continental basin environments (2) to define a reliable magnetic stratigraphy of representative stratigraphic sections in the area; (3) to increase our knowledge on paleogeography and paleoclimate in central and northern Italy during the Plio-Pleistocene.

The PhD thesis will be carried out in the Department of Geological Sciences of Roma TRE University in cooperation with the paleomagnetic laboratory of INGV.

The activation of a doctoral scholarship is reserved to students with a huge background in Plio-Pleistocene continental stratigraphy.

DOCTORAL SCHOOL IN EDUCATION AND SOCIAL WORK
"Education"

1 position with fellowship (€ 13.638,47 - gross amount per year)

Course Coordinator: Prof. Massimiliano Fiorucci (fiorucci@uniroma3.it)

Objectives

Higher education and research activity training, also towards job placement. The doctoral school aims to coordinate and improve existing potentialities in research education and in educational and social professions training. Connections between educational and social professions imply shared epistemological aspects, developing professional and research activities.

Fields of research

The Doctoral School develops research programs on different issues related to methodologies (action research, oral history and life history, source documents research, qualitative and quantitative research methods, intervention research, participative observation), involving strong connection among them in order to achieve appropriate cognitive outcomes in relation to the complexity of investigated problems. The section "education" offers an interdisciplinary and international approach in four main topics: education and training problems in modern and contemporary society; individualized teaching; media and communication; interculturalism.

DOCTORAL SCHOOL IN EDUCATION AND SOCIAL WORK
"Social Work"

1 position with fellowship (€ 13.638,47 - gross amount per year)

Course Coordinator: Prof. Vittorio Cotesta (cotesta@uniroma3.it)

Objectives

Higher education and research activity training, also towards job placement. The doctoral school aims to coordinate and improve existing potentialities in research education and in educational and social professions training. Connections between educational and social professions imply shared epistemological aspects, developing professional and research activities.

Fields of research

The Doctoral School develops research programs on different issues related to methodologies (action research, oral history and life history, source documents research, qualitative and quantitative research methods, intervention research, participative observation), involving strong connection among them in order to achieve appropriate cognitive outcomes in relation to the complexity of investigated problems. The section "Social Work" offers an interdisciplinary and international approach in the following main topics: a) politics on reduction of social inequalities and human empowerment; b) civil society and social volunteering; c) social work as a helping profession.

DOCTORAL SCHOOL IN ECONOMICS AND QUANTITATIVE METHODS
"Political Economy"

1 position without fellowship (no fees requested)

Course Coordinator: Prof. Attilio TREZZINI (trezzini@uniroma3.it - armando.corsi@uniroma3.it)

The Political Economy section of the Doctorate School in Economics and Quantitative Methods of Roma Tre is characterized by a pluralistic approach encompassing not only the dominant Neoclassical viewpoint but also the critical views originating from the work of Piero Sraffa and based on a modern reappraisal of the classical economists. This broad approach is reflected in the structure of the doctorate, the first year of which involves teaching designed both to examine the

dominant theories in greater depth and to provide an essential grounding in the theoretical analyses based on the viewpoint of the classical economists.

The doctorate in Political Economy of Rome University III is a three-year course. The whole of the first year is devoted to cycles of lectures and to writing short papers on bibliographic material agreed upon with the supervisors for individual discussion with the same. As regards lectures, agreement has been reached with the corresponding doctorate school at La Sapienza University of Rome to hold a number of joint courses. The students will be examined on the subjects addressed at the end of each of the two semesters. The activities of the first year are designed as a whole to complete the basic grounding of the doctoral candidates and initiate the preparation specifically related to the thesis.

The following two years are devoted to developing the individual research upon which the thesis is based. Students are encouraged to take advantage of the provision for studying outside Italy during this period. At the beginning of the second year, they submit a paper (developed through consultation with their supervisor or another lecturer designated by the board for that purpose) serving to identify a theme for the doctorate thesis. The board of lecturers then assigns the student a research director to report periodically on the work undertaken, indicate the need for study at other universities inside or outside Italy, and assess whether it is necessary to appoint an "external" supervisor possessing particular expertise in the chosen area of study. At the end of the second year, the student presents a written report on the work carried out and the state of progress as regards the research project.

All students can be invited during the third year to hold a seminar to present the results achieved thus far in their research.

DOCTORAL SCHOOL IN ECONOMICS AND QUANTITATIVE METHODS **"Statistical Methods for Economics and Business"**

1 position without fellowship (no fees requested)

Course Coordinator: Prof. Julia MORTERA (mortera@uniroma3.it - armando.corsi@uniroma3.it)

The 3-year PhD programme in Statistical Methods for Economics and Business offers advanced study and research that combines analytical and quantitative skills together with applications to prepare students to pursue careers in academia, research organizations, government and private industry.

Students will have the opportunity to work closely with faculty members in small classes, seminars, research projects and other assignments aimed toward developing strong analytical skills, breadth of knowledge in statistical issues and strong competencies

to conduct independent, quality research. In this age of advanced technology, there is an increasing demand for individuals with the expertise in analyzing large complex data sets via the latest advances in computing.

In the first year covers topics in Statistical Theory and Methodology, Econometrics, Graphical Models, Bayesian Networks, Simulation and Computing among others, as well as numerous seminars on frontier statistical methods. The second year is dedicated to a thesis research project and students can spend part of the year in a foreign university. The third year is entirely dedicated to finalizing the PhD thesis.

DOCTORAL SCHOOL IN ENGINEERING **"Computer Science and Automation"**

2 positions with fellowship (€ 13.638,47 - gross amount per year)

Course Coordinator: Prof. Stefano Panzieri (panzieri@uniroma3.it - perri@dia.uniroma3.it)

The PhD program of the Computer Science and Automation Section of the Doctoral school of

Engineering aims at preparing first class researchers and future leaders in Computer Engineering, Automation and Robotics who will either continue the research career, both in Universities and in research centers, or will lead industrial research and development

projects. A Faculty of internationally recognized researchers and professors from the Department of Informatics and Automation (DIA) of Roma Tre University is responsible for the educational activities and takes part in the organization of the doctoral program.

The course covers a three-year period. The first year is mainly devoted to deepening the background of each student with introductory courses covering the relevant topics in the research areas of the PhD program and advanced courses illustrating new results and techniques in specific fields. These courses aim to facilitate students in choosing the PhD research topic. The second and third years are devoted to research with emphasis on active

participation in the research projects of DIA, attendance to conferences, schools and seminars, publication of papers in journals and conference proceedings, and the preparation of the final thesis. Usually, each student spends a period of six months in an international research center.

The research areas of the PhD program span the whole spectrum of the department research programs, which are the following:

(1) **AUTOMATION AND INDUSTRIAL ORGANIZATION:** this program focus on the development of models, methods and tools for the efficient utilization of resources. The theoretical background is in the fields of Operations Research and Control Theory, including discrete optimization, complexity theory, discrete event systems and the development of algorithms in these contexts. Recent works in the applications area include finite capacity scheduling, supply chain management, real time traffic management, agent-oriented decentralized management systems.

(2) **ARTIFICIAL INTELLIGENCE:** the program relates to AI models, methods and tools and their applications to create extremely flexible, autonomous, adaptive and reliable systems, well-grounded from a theoretical point of view. The program's research projects particularly focus on the formal base and theoretical grounds, both regarding the use of exploration and empirical experimental techniques to analyze, create and assess the conceived systems.

(3) **NETWORK ANALYSIS AND VISUALIZATION:** the general goal of this program is to develop new methodologies and tools for network analysis and visualization, with applications to computer network discovery and management. Given the great research opportunities offered by the new generation computer networks, the focus of the program progressively embodied, together with the visualization and analysis problems, pure computer networks research topics.

(4) **DATABASES AND INFORMATION SYSTEMS:** the general goal of the database program is the study of new principles, methods and tools for the organization and management of information, in the form of databases, that is, systematic collections of data that are large, persistent, and shared. The current focus of the program is on the new requirements generated by the growth of the Internet and WWW, with the possible availability of different and heterogeneous sources of information. The program includes various projects in each of which the attention is both on principles and on experimentation.

(5) **COMPUTER-AIDED DESIGN:** the mission of this program is to pursue research on geometric modeling and visual simulation of engineering problems using CAD/PLM technologies. The group has concentrate its efforts on the following areas: functional programming with design languages, parallel and distributed processing, geometric and solid modeling, computer-aided design and computer graphics for scientific visualization, and geometrical and physical modeling of bio-systems.

(6) **ROBOTICS:** the robotics program is mainly focused on methodologies and technologies for sensor based navigation of cooperating autonomous vehicles in partially structured environments. Research interests include: processing of sensors data for the purpose of localization, motion planning, and environmental mapping, modelling and control of mobile robots with lightweight manipulators, development of distributed control and estimation techniques, and modelling of complex interconnected systems.

DOCTORAL SCHOOL IN ENGINEERING

"Biomedical electronics, electromagnetics and telecommunications"

- 2** positions with fellowship (€ 13.638,47 - gross amount per year)
- 2** position without fellowship (no fees requested)

Course Coordinator: Prof. Lucio Vegni (vegni@uniroma3.it – spica@uniroma3.it)

This Doctoral Section has the following objectives: 1) training of specialized professional figures and new researchers to be employed into European, national and local, public and private Institutions; 2) promotion of the research in University structures through the contribution of innovative and stimulating professional figures; 3) supporting Industrial Companies dealing with Information Technology by using excellent professional figures for research, development and industrial applications; 4) support the teaching in the Italian University through new researchers.

The Section relates to the following thematic areas and research sectors:

- (1) Electrochemistry: research on electronic materials and hybrid materials organic-inorganic.
- (2) Electromagnetics: microwave integrated antennas, microwave passive components realized by innovative materials (e.g. metamaterials, nanomaterials); antennas for plasma heating for nuclear fusion; bioelectromagnetics, electromagnetic compatibility; scattering of electromagnetic waves in cylindrical structures; screens, polarizers and transmission lines; electromagnetic methods for optics; numerical methods for complex electromagnetic structures; innovative electromagnetic techniques for bioengineering and biomedicine.
- (3) Biomedical engineering: algorithms and systems for biomedical engineering; image processing for human movement analysis; posture analysis for clinical and research trials; biomedical signal processing; biosensors; biological materials; prostheses; integrated multimedia systems for telemedicine; neural systems for motor control studies.
- (4) Electrotechnics: magnetohydrodynamic energy conversion; models, neural nets and genetic algorithms applied to dynamic magnetic hysteresis; neural networks to RNA e DNA sequences recognition.
- (5) Environment physics: thermal analysis and design of complex electronic systems.
- (6) Photonics: partially coherent sources; fiber-optic natural lighting; optical methods for non invasive diagnosis of thermal flows in electronic systems and development of air conditioning in mobile environments; properties of partially polarised optical fields and gratings.
- (7) Superconductivity and microwaves: experimental systems for the measurement of microwave surface impedance, and magnetic and electric characterization of new materials.
- (8) Telecommunications: SOA amplifiers in optical networks; images coding; mobile and multimedia communications; laser quantum dot devices; image modelling; modelling of highly ordered quantum dot short wavelength lasers/LEDs; modelling PhC and nanoimprinted sub-wavelength photonic components; project of components and planar devices for optical communications; wavelets and multimedia signals; packet GMPLS in optical networks; fourth generation TLC systems; OCDMA division optical transmission systems; vision systems; bayesian techniques for image quality improvement; non-conventional techniques for spatio-temporal signal processing.

DOCTORAL SCHOOL IN ENGINEERING

"Mechanical and Industrial Engineering"

- 2** positions with fellowship (€ 13.638,47 - gross amount per year)

Course Coordinator: Prof. Edoardo Bemporad (e.bemporad@uniroma3.it – cibati@uniroma3.it)

The PhD program of the Mechanical and Industrial Engineering section is aimed at creating researchers with broadband skills, each one specialized on a particular subject offered by the school. Those skills would be oriented to develop proper methodologies in order to integrate

different kinds of problems: thermo mechanical, fluid-dynamics and electro mechanics problems with constructive, technical, measurements, economical and managerial problems with attention to the chemical and noise pollution and workers' safety. All of these problems are related to a complex industrial system and the attention pointed on them will be important for a good cost-benefit analysis of economic aspects and cost-performance ratio. Industrial systems involved in the production of goods and services are continuously evolving toward new and highly diversified forms, providing specialized solutions for complex problems. At the same time a greater attention is given to interactions with between industrial system in general and the environment (noise and chemical pollution, workers' safety and wellness): this requires the use of new investigation and risk management procedures based on clear and well-designed standards, together with a full consciousness about impact of the old and the new technologies from design to recycle or reuse of items and services. As a consequence of this growing demand, the diffusion of a new approach has to be supported through the widening of technical and scientific knowledge in which the interdisciplinary aspect plays a decisive role. In fact, only an interdisciplinary knowledge would provide highly qualified professional staff with a high efficiency and reliability which otherwise would be lost, with bad economic and environmental consequences. The actual inefficiency is mainly due to a lack of the correct philosophy of approaching the problem, as old methodologies were not oriented to the solution of the whole system but only to a part of it. So, even each solution was right singularly, the absence of a general guide line led to an ineffective integration of results and to a decrease in effectiveness and affordability of the system. Developed areas are involved in activities based on design and management of complex systems, is therefore needed to create suitable abilities. In our country, also, the attention of the scientists is focused on this problem not only on the industrial level but also at the academic one. At the academic level, the research is encouraged by improved numerical simulation that allow a greater and more specific approach.

The course covers a three-year period. The first year is mainly dedicated to widen the background of each student by frequenting introductory courses covering the relevant topics in the research areas of the PhD program and advanced courses illustrating new results and techniques in specific fields. These courses aim to facilitate students in choosing their specific PhD research topic. The second and third years are dedicated to the research with emphasis on active participation in the research projects of the Mechanical and Industrial Engineering Department, attendance to conferences, schools and seminars, publication of papers in journals and conference proceedings, preparation and development of the final thesis. There is a possibility for every student relatively to the specific requirements to pass a period of time in an international research center.

The research areas of the PhD program covers the whole spectrum of the department research programs, which are the following: Aeronautical Constructions Chemistry Converters, Machines and Electrical Actuators Excavation Engineering and Safety Fluid Dynamics and Machines Mechanical and Thermal Measurements Mechanical Design and Machine Constructions Materials Science and Technology Technical Physics.

Specific information will be available at the following URL: www.stm.uniroma3.it

DOCTORAL SCHOOL IN ENGINEERING

"Civil engineering"

2 positions with fellowship (€ 13.638,47 - gross amount per year)

Course Coordinator: Prof. Leopoldo Franco (leofranc@uniroma3.it - cquattrociocche@uniroma3.it)

DOCTORATE/DOCTORAL SCHOOL SECTION of CIVIL ENGINEERING

This Doctoral Section has at the following objectives:

- 1) training of specialized professional figures and new researchers to be employed into European, national and local public and private Institutions;
- 2) promotion of the research in University structures through the contribution of innovative and

stimulating professional figures;

3) support the teaching in the Italian University through new researchers.

The Section relates to the following thematic areas and research topics and subsectors:

1) Hydraulics

1.1 Theoretical and experimental modelling of complex fluids and interaction with the environment

1.1.1 Sloshing of a free surface liquid in a moving container

1.1.2 Two-phase transient pipe-flow

1.1.3 Local scour downstream of hydraulic structures

1.1.4 Gravity currents and their interaction with the environment

2) Water Management

2.1 Hydrology and Water Resources

2.1.1 Flow and transport of solutes in heterogeneous porous media

2.1.2 Inference of transmissivity through pumping test

2.1.3 Solute transport in the combined vadose zone-groundwater system

2.1.4 Effective properties in heterogeneous porous media

2.1.5 Residence time and streamflow generation in small catchments

2.1.6 Rainfall-runoff modelling

2.1.7 Analysis of the statistical properties of rainfall fields

2.1.8 Analysis of the statistical properties of the peak flow annual maxima

2.1.9 Flood plain modelling

2.2 Coastal Protection and Design of Maritime Structures

2.2.1 Development of a new solver of the Boussinesq Type Equations for the nearshore hydrodynamics

2.2.2 Numerical and experimental modelling of wave energy converters

2.2.3 Assessment of wave and wind energy resources in the Mediterranean Sea using numerical modelling

2.2.4 Statistical analysis of extreme wave events

2.2.5 Numerical modelling of generation, propagation and interaction with coasts and maritime structures of tsunamis

2.2.6 Laboratory techniques for the generation of tsunamis

2.2.7 Numerical modelling of short and long waves and currents in harbours

2.2.8 Innovative design of marinas and caisson breakwaters

2.2.9 Artificial surf reefs

3) Roads, Railways and Airports

3.1 Advanced geometric design of roads and motorways

3.1.1 Systemic check of the road project's property under the profile of the road safety

3.1.2 Validation of the systemic operability of the road referring to the existing infrastructures

3.1.3 Analysis of driver behaviour

3.1.4 Analysis of systemic operability of road Italian networks

3.1.5 Geometric design consistency and operational effects

3.2 New materials and technologies for development and management of transport infrastructures

3.2.1 Optimization of technical strategies for road networks rehabilitation

3.2.2 Rehabilitation of existing roads for increasing road safety

3.2.3 Pavement damage diagnosis using GPR

3.2.4 Standardization of high performance techniques for pavement damage diagnostic using Ground Penetrating Radar

3.2.5 Road pavement monitoring using GPR

3.2.6 Recycling of construction and demolition wastes – Analysis of the standards for applications in road and railway constructions

3.2.7 Waste recycling for roads and railways construction

4) Transportation

4.1 Urban transportation network

- 4.1.1 Instruments for the evaluation and monitoring of strategic actions in large degraded urban areas
- 4.1.2 Innovative vehicles; analysis and validation of a new dualmode trolleybus
- 4.1.3 Development and experiment of cold start and hot soak emission modelling during the parking process
- 4.2 Systems and technologies for traffic control and regulation
 - 4.2.1 Interaction between signal settings and traffic flow patterns on road networks
 - 4.2.2 Development of a mobility model on ANAS traffic network to evaluate traffic volumes parameters, optimal location of traffic count sections, impact of a single link change on the global network
 - 4.2.3 Validation of traffic monitoring systems
- 5) Structures
 - 5.1 Mechanics of Materials and Structures
 - 5.1.1 Masonry Mechanics
 - 5.1.2 Nonlinear analysis of Trusses, Tensegrities and Thin Walled Beams
 - 5.1.3 Dynamics and identification of uncertain structures
 - 5.1.4 Durability and performance decay of structural elements
 - 5.1.5 Response analysis and aerodynamics of very long span suspension bridges
 - 5.2 Structural Engineering.
 - 5.2.1 Safety evaluation for masonry structures
 - 5.2.2 Seismic risk assessment of industrial plants
 - 5.2.3 Analytical and experimental studies of the behaviour of structures and structural elements
 - 5.2.4 Post-earthquake evaluation of RC bridges.
 - 5.2.5 Evaluation, rehabilitation, and repair of existing structures.
 - 5.2.6 Performance-based earthquake engineering.
 - 5.2.7 Probabilistic risk assessment of structures and Life-lines
 - 5.2.8 Passive and semi-active risk reduction methods
 - 5.2.9 Assessment and rehabilitation of historic structures
 - 5.2.10 Reinforcement of masonry and concrete structures with composites
 - 5.2.11 Low impact technologies
- 6) Geotechnics
 - 6.1 Slope stability and tunnelling in rock masses
 - 6.1.1 Prediction of lining loads and displacements around bored tunnels;
 - 6.1.2 Application of passive reinforcements in rock foundations;
 - 6.1.3 Slope stability problems in the preservation of ancient towns.

DOCTORATE: INNOVATION AND EVALUATION OF SCHOOL SYSTEMS

2 positions with fellowship (€ 13.638,47 - gross amount per year)

Course Coordinator: Prof. Bruno LOSITO (losito@uniroma3.it)

The Doctoral Course in "Innovation and Evaluation of School Systems" ("Innovazione e valutazione dei sistemi di istruzione") within the École Doctorale Internationale "Culture, Éducation, Communication" is held at the Department of Educational Design (Diped), University Roma Tre, Via della Madonna dei Monti 40, 00184 Rome, Italy (www.diped.it). In the School, founded by a consortium of seven universities, converge interests and sensitivity resulting from experience different path of research and the context of action, but mutually complementary as regards the deepening of the issues which the doctoral qualification refers. Faced with the uncertainties that occur in cultural trends as in educational choices and patterns of communication, the School aims at providing a contribution to foster professional development in research and study activities. The international feature of the school allows to define, through the joint supervision between different sites, curricula more responsive to the needs of research projects based on interdisciplinarity and

internationalization. The Doctorate Course in "Innovation and Evaluation of Educational Systems" includes in its Board scholars who gained significant experience of working to the most relevant comparative research carried out in recent decades. 1. Research areas In 2011-2013, the École Doctorale will develop, in the Doctorate courses, the following programme: "Heritage, Identity, Memory in the Era of New Technologies". The teams working in the School want to direct PhD students towards the study of the impact of new technologies on traditional knowledge, cultural production, heritage, historical memory, identity, education. This approach will allow students to make a choice between the study of: - Language (linguistic skills, socio-political transformations, lexicometric analysis); - Cultural levels (international educational comparison at different ages, cultural profile of the population); - Education (individualised learning, school systems evaluation, lifelong learning); - Knowledge engineering (information gathering and processing, interface design specially for distance education); - Cultural mediation (museums, heritage, studies on visitors). In accordance with Dublin indicators, the universities involved in the creation of the School are pursuing the following goals: ensure high quality education and training for research by giving PhD students the chance to benefit from the scientific and teaching experience of several academic institutions; intervene in the various tasks characterizing the researcher profile, thus allowing PhD students to acquire instrumental skills crossing different disciplines; develop the knowledge of several EU languages and cultures through the numerous meetings aiming to practically demonstrate that is impossible to communicate in an international situation without mastering at least one language different from their mother tongue; create an early international network of new researchers to encourage the creation of partnerships also for presenting European projects. 2. Documents for application and selection criteria Candidates will be selected on the basis of: - (mandatory) university (or equivalent) degree; - (mandatory) abstract of the final thesis; - (mandatory) list of passed examinations; - (mandatory) curriculum vitae et studiorum; - (mandatory) a proposed research project within the programme "Heritage, Identity, Memory in the Era of New Technologies"; - (mandatory) at least three reference letters provided and signed by relevant members of the international scientific community, relating to the candidate's chosen course; - (if any) additional document and/or publication that the candidate deems worth of consideration, including associations to research institutions (MAX 5 more documents proving activities that the candidate deems worth of consideration). 3. Duration of the course and laboratory attendance The degree of Doctor in "Innovazione e valutazione dei sistemi di istruzione" is obtained after 3 years of doctoral studies. Twice a year students will be asked to present their results to be admitted to the following year in the form a written presentation. The thesis can be prepared in Italian, English or French (with a large summary in Italian). Daily attendance of courses and laboratories within the Department of Educational Design is required for ca. 3 days a week and ca. 9 months a year. 4. Salary and general information The net yearly salary (only for students who get a grant) is ca. 12,000 Euros (i.e., ca. 1,000 Euros per month for a duration of 36 months). Travel, accommodation in Rome, meals and transportation are at the student's expenses. The University Research Office and the student's supervisor will assist him/her in obtaining the immigration visa, but students are asked to travel to Rome at their own expenses. Further information are available at <http://lps2.uniroma3.it/edi>.

DOCTORAL SCHOOL in MATHEMATICAL AND PHYSICAL SCIENCES

"Physics"

- 2** positions with fellowship (€ 13.638,47 - gross amount per year)
- 1** position without fellowship (no fees requested)

Course Coordinator: Prof. Orlando Ragnisco (ragnisco@uniroma3.it – dottorato@fis.uniroma3.it)

THE DOCTORATE IN PHYSICS AT ROMA TRE UNIVERSITY

The Doctorate in Physics of Roma TRE University dates back to 1999. Each Ph.D. Course (here we say "Cycle") lasts for three years: so far about 100 Ph.D. students have already got their degree: it

is worth noticing that more than 80% of Doctors have at the moment a research position (although, in most cases, a temporary one) at foreign or domestic Universities or Research Institutes.

- Main features and Goals: The Roma TRE Ph.D. School in Physics aims at training young people towards a research activity at a high international level, so that they could be successfully employed either in domestic or in foreign Universities and Research Centres or in Industrial Companies carrying out programs with advanced technological content. A key role is played by the "Ph.D. Committee" that takes care of the Organisation of the Ph.D School in Physics and must guarantee that the above institutional goals are achieved. It consists of 17 members, 14 belonging to the Physics Department and 3 to external research institutions or University Departments. They are highly qualified scientists and work in different research areas (High Energy Physics, Theoretical and Mathematical Physics, Condensed Matter Physics, Astrophysics, Geophysics). The "Ph.D. Committee" is elected by the Physics Department and in turn elects one of his members as Chair of the Ph.D. School. He is in charge for 4 years.

- Organization of the PhD School in Physics. So far, a formal branching in different "curricula" has not been established. Accordingly, no difference is made between "basic" and "specific" courses. There are however a number of different research areas that can be selected by the Ph.D. students, namely High Energy Physics, Mathematical Physics, Condensed Matter Physics, Astrophysics, Geophysics, and the delivered courses are supposed to cover all of the above subjects. During the first year, the Ph.D. students are asked to attend courses for 20 credits, each one corresponding to 6 hours, provided by the School. The teachers are usually members of the Committee or of the involved departments: however, quite often we have external scientists, often foreign ones, who deliver seminars or even series of lectures. Thanks to an existing agreement among the Ph.D. Schools of Rome area, students are allowed to attend a subset of their courses at La Sapienza or at Tor Vergata Universities. Additional credits are to be obtained by attending appropriate International Schools at the Ph.D. level. When choosing the courses and the Schools to attend the students are assisted by a "tutor", who has to be a member of the Ph.D. Committee. The tutor acts as a guide and a supervisor for the scientific activity of the Ph.D. student; normally he suggests the subject of the thesis and takes care of the student throughout the whole Ph.D. course. Exceptionally, the Ph.D. student can be allowed by the Committee to carry out his research activity under the supervision of an external scientist, affiliated with other Universities or Research Institutes: in this case, the internal "tutor" acts as a "link" between the external supervisor and the Ph.D. Committee, and guarantees that both the subject and the scientific level of the research be suitable. Moreover, we have at the moment a small, but non negligible number of Ph.D. students doing their Ph.D. course in joint tutorship with foreign laboratories or Universities. The admission to the second year is not automatic: on the one hand, the student is requested to overcome a proof, usually consisting in an oral or written report, for each of the courses he has attended. He has to write down a report on his activity and a schematic description of his research project: both have to be validated by the tutor, who in turn has to submit his own report to the Ph.D. Committee for the approval. The second and third year are essentially devoted to the research activity on the thesis subject, though in their second year Ph.D. students are in addition asked to attend specific Schools or Workshops. At the end of the second year, the student presents to the Committee an oral report, where the stage attained by his research work is discussed. In particular, he has to explain the achieved results and the perspectives for the third year, including open problems and possible drawbacks. If the report is approved by the Committee, the student is admitted to the third year. One month before the end of the third year, each student submits his thesis to an external referee, suggested by the tutor and agreed by the Ph.D. Committee. The referee can recommend amendments, or even a deep revision of the thesis. Once the (amended) version of the thesis is approved, the student presents his final report to the Ph.D. Committee, who admits him to the final exam, on the basis of the final referee report (if needed), of the student report and of the tutor report.

- Typically, the final exam consists of a 30 minutes seminar in front of an external commission,

followed by a 15 minutes discussion. The members of the commission cannot be part of the Ph.D. Committee. They usually belong to other Universities or Research Institutions, often foreign ones. They have to be at least 3, possibly supplemented by one or two experts on specific subjects. Different rules can be followed in case of Ph.D. students with joint tutorships. The members of the committee write a report on the candidates, where the scientific level of the thesis and of the presentation is evaluated, and it is made clear whether the candidate deserves (or not) the title of "Dottore di Ricerca in Fisica". However, no grades and no explicit ordering among the candidates is foreseen.

•International relationships Our Ph.D. School enjoys several collaboration agreements with national Research Institutions (such as I.N.F.N and C.N.R.) as well as international ones, like CERN in Geneva. Moreover, our Ph.D. students have access to the large scale facilities located at Trieste (Electra), Grenoble, Readings (Rutherford Lab.). Exchange agreements at pre-doctoral level within the Socrates- Erasmus Program are established with French (Cergy-Pontoise) and Spanish (Madrid Compl., Valladolid, Burgos, Barcelona) Universities. They can involve both professors and Ph.D. students. Cotutorships have been established in a recent past (and some of them are still active) with the Universities of Grenoble, Marseille, Savoie (France), Autonomia Barcelona (Spain), Augsburg and Humboldt University (Germany), New Jersey University at Rutgers (USA). In addition to the above institutional collaborations, the member of our Physics Department and of our Ph.D. Committee have a number of informal collaborations with foreign scientists. Those have been crucial for allowing our Ph.D. students to work in a true international context. The impressive number of publications on international Journals, as well as of (often invited) talks and posters presented by our Ph.D. students provides a meaningful indication of the scientific relevance of their work inside the international community of physicists.

For the XXVIII cycle we plan to reserve 2 positions with fellowship and 1 position without fellowship to foreign applicants.

DOCTORAL SCHOOL in MATHEMATICAL AND PHYSICAL SCIENCES **"Mathematical"**

- 1** position with fellowship (€ 13.638,47 - gross amount per year)
- 1** position without fellowship (no fees requested)

Course Coordinator: Prof. Luigi Chierchia ("luigi@mat.uniroma3.it" - dottric@matrm3.mat.uniroma3.it)

1. The Ph. D. program in Mathematics at the University Roma Tre started 12 years ago in 2000. So we had 12 starting classes (in Italy we call a class a cycle) involving altogether about 55 students.

At the present time 9 cycles have been completed and we graduated 34 Ph. D. students.

75% of our Ph. D. graduate have at the moment a research position in research institute or universities in Italy or abroad (and about 50% of our graduate students held a position abroad after completing their Ph. D in Roma Tre)

2. The Roma Tre Ph. D. program in Mathematics aims at training students towards a research activity in pure or applied Mathematics at high international standards.

Therefore, a Ph. D. graduate in Mathematics from Roma Tre is in a very good position to find high level employment in either the academic world (Universities and research center either domestic or foreign) or companies of the private sector carrying out advanced research projects.

3 Main Research Fields:

3.1 Algebra: Rings of Kronecker functions, Nagata rings, multiplicative system of ideals in commutative rings, Gabriel-Popescu localizing system and associated (semi)star operations.

3.2 Algebraic geometry and differential geometry: moduli spaces of curves and algebraic varieties, deformations theory, higher dimensional algebraic varieties, classification of algebraic varieties. Selfdual 4-manifolds, twistor theory; hermitian geometry of

complex surfaces.

3.3 Mathematical Analysis and Dynamical Systems: Differential equations with Hamiltonian structure and small divisors problems (classical Hamiltonian systems and celestial mechanics, partial differential equations with Hamiltonian structure, extension of Aubry-Mather theory). Nonlinear eigenvalue problems with singular nonlinearities: existences, unicity and compactness; asymptotic analysis and construction of blow-up solutions for two-dimensional elliptic equations arising from Gauge theory; asymptotic analysis for singular perturbation problems or Sobolev with critical growth.

3.4 Probability: Stochastic evolution for system of interaction particles with emphasis to relaxation time. Optimization problem in a random environment, Markov chain Monte Carlo algorithm for computational complex problem, metastability and estimates for large deviations, random walks on random graphs.

3.5 Mathematical Physics: Random Walks in time-fluctuating random environments; Anderson's parabolic model for almost stationary environments.

3.6 Numerical Analysis: Level set methods: schemes for mean curvature motion, convergence, fast marching implementation (non iterative). Large time-steps schemes, semi-Lagrangian and Lagrang-Galerkin schemes, linear diffusion-transport problems and conservation laws with viscosity terms.

3.7 Applied Mathematics and Scientific Computing: Probabilistic method (and Probabilistic domain decompositions as well) for numerically solving: boundary problems for elliptic equations, initial boundary problem for parabolic equations and furthermore application to certain class of nonlinear partial differential equations (such as KPP, Navier-Stokes, Vlasov-Poisson) .

3.8 Computer Science: Modeling and analysis of complex system, in particular: social networks, wireless networks and the internet graph; security of distributed system; data and networks security techniques; algorithm, techniques and application of data mining.

4. Organization of the Ph. D. program

During the first year, the Ph.D. students are asked to attend four courses for 40 credits.

The courses can be chosen not only from the ones offered by the Department of Mathematics of Roma Tre but, thanks to an existing agreement among the Ph.D. Schools of Rome area, also from the courses offered at La Sapienza or at Tor Vergata Universities.

Additional credits can be obtained by attending appropriate International Schools at the Ph.D. level and by attending series of seminars held either in Roma Tre or in La Sapienza or at Tor Vergata. When choosing the courses and the Schools to attend the students are assisted by a "tutor", who is a member of the Board of Professors. The tutor acts as a guide and a supervisor for the scientific activity of the Ph.D. student. Within the first year students have to choose an advisor. The advisor will normally suggest the subject of the thesis and takes care of the student for the remaining of the Ph. D. program. A Ph.D. student can be allowed by the Board to carry out her/his research activity under the supervision of an external scientist; in this case, the internal "tutor" acts as a link between the external supervisor and the Board of Professors. The admission to the second year is not automatic but is based on an oral exam. The second and third year are essentially devoted to research activities on the thesis subject, though in their second year Ph.D. students are, in addition, asked to attend one course, and are encouraged to attend Schools or Workshops. At the end of the second year, the student presents to a Committee an oral report, in order to be admitted to the third year.

5. Admission exam

- The applicants will be pre-selected on the basis of their scientific curriculum, which must include, in particular, at least three letters of recommendation.

- The curriculum, the recommendation letters, academic records, scientific publications (if any), and other relevant material should be presented according to Roma Tre University rules, elsewhere specified.

- Pre-selected applicants will undergo a web interview through Skype (contacting the username phd_program_roma3); the interview

will also include a testing of basic knowledge in Mathematical analysis, Algebra and Geometry. The date of the interview will be October 2, 2012; the time will be communicated, October 1st 2012 by e-mail. Applicants must indicate a valid e-mail where to be contacted by sending a message to dottric@mat.uniroma3.it before September 26, 2012 (a confirmation e-mail will be sent upon reception).

DOCTORAL SCHOOL IN POLITICAL STUDIES "European and International Studies"

- 1** position with fellowship (€ 13.638,47 - gross amount per year)
- 1** position without fellowship (no fees requested)

School Director: Prof. Renato Moro (moro@uniroma3.it)

Specific information are available at:

- moro@uniroma3.it (for the School)
- nuti@uniroma3.it (for the Section of European and International Studies)

The Doctoral School in Political Studies was created in 2004. It offers PhD courses in four basic areas of the social sciences. The School develops research programs on issues related to the study of politics such as:

- economics and statistics
- history and cultural studies
- law
- sociology and political science

The Doctoral School features a markedly interdisciplinary and international approach. Interdisciplinary work is at the heart of the PhD curriculum in its cross-disciplinary seminars and study groups, designed to complement the specialized instruction given in each program. Our international approach takes several forms, including a wide range of international visiting professors, the opportunity to do research abroad, and the integration of students into the international community of scholars through lectures, colloquia and international research projects. A number of foreign professors are also invited to sit on PhD committees for the final defense of the dissertations.

Section of European and International Studies

In the section of European and International Studies students can choose from a wide range of subjects such as Comparative Politics, Area Studies (Western and Eastern Europe, Africa, Asia, USA, Latin America), International Relations, European Policies of Integration, European Institutions, Modern and Contemporary History, Economics, International Law and Political Sociology.

In 2012 the School offers PhD Programs in:

Africa
Central and Eastern Europe
Cultural Studies
European Studies
History of International Politics
History of Politics
International Law
Latin America
Migrations, Networks, Conflicts
Peace Studies
Political Science
Political Thought

United States of America

Our Doctoral School Program offers a variety of courses providing skills marketable for a wide range of professional arenas. Doctoral students will also have a chance to participate in research projects run by the Department of International Studies.

The PhD Programs of the Section of European and International Studies count roughly 20 doctoral candidates. About 6 defend their dissertations each year. Students are taught and supervised by a faculty of more than 18 university professors and lecturers, mostly coming from the research community of the Department of International Studies. The close links between the Doctoral School and the Department enable young scholars to participate in such activities of the academic community as research groups/contracts, publications and academic reports.

The Doctoral School also invites external academics and representatives of the private sector to take part in various activities. Every year, the Doctoral School welcomes many visiting professors to teach, take part in various activities and deliver lectures: among them, in the last two years, Frédéric Bozo (Sorbonne), Antoine Compagnon (Collège de France), David Holloway (Stanford), Annick Jaulin (Sorbonne), Marc Lazar (SciencesPo), Melvyn Leffler (Virginia), Christian Ostermann (Woodrow Wilson Center), Nell Painter (Princeton), Jeremy Suri (Madison), Irwin Wall (California), Bengt-Arne Wickström (Von Humboldt), Vladislav Zubok (Temple). In particular, every year an outstanding international scholar leads a specific multidisciplinary seminar with our students.

The Doctoral School in Political Science has also launched student exchange programs and research collaboration projects with the following partner Universities and Research Centres in Italy and abroad:

- Centro de Estudios Politicos y Constitucionales - Madrid
- Centro Interuniversitario "Machiavelli" sulla Storia dei conflitti strutturali durante la guerra fredda
- CRIE (Centro di ricerca sulle Istituzioni Europee) presso l'Istituto Universitario Suor Orsola Benincasa - Napoli
- Friedrich Schiller-Universität - Jena
- Istituto De Gasperi di Studi Europei
- Istituto Jeremy Bentham di Studi Giuridici e Politologici
- SciencesPo - Paris
- Scuola Superiore dell'Amministrazione dell'Interno - Roma
- The National Security Archives - Washington
- Universidad de Valencia
- Universidad Rey Juan Carlos – Madrid
- Universitat Autònoma – Barcelona (Dipartimento di Storia contemporanea)
- Universidad Carlos III - Madrid (Dipartimento di Scienze Politiche e Sociali)
- Universidad de Castellon
- University of Cluj-Napoca (Dipartimento di Storia)
- University of Craiova (Dipartimento di Storia)
- University of Groningen (Departement of Political Sciences)
- Universidad de Sevilla (Dipartimento di Metafisica y Corrientes Actuales de la Filosofia, Etica y Filosofia Politica)
- Universität Bremen (Department of Political Sciences)
- Université Charles De Gaulle Lille III
- Université Montpellier III Paul Valery (Département de Philosophie)
- Université Nancy
- Université Nantes
- Université Paris I Sorbona (Ecole doctorale en Sciences Politiques /Ecole Doctorale en Philosophie)
- Université Paris III
- Université Paris XIII (Département d'Histoire)
- University of Leiden (Department of Public Administration)
- Woodrow Wilson Center for International Studies

The selection of candidates will be carried out by the Supervising Committee. The first test will be the exam of the candidates' dossier, with these criteria:

CV, additional documents and/or publications (points 0-5);
thesis (points 0-15)
reference letters (points 0-10);
research project (points 0-30).

The second test will be an interview of the selected candidates with the Supervising Committee (also through Internet). The candidate's cultural and research background will be discussed, examining the research project, the curriculum vitae et studiorum, the thesis (and publications). As most courses are taught in Italian, a good command of Italian (and English) is necessary to pursuing studies at the Doctoral School. Such skills will be assessed.

Candidates will have to specify in the TITLE OF THEIR RESEARCH PROJECT:

- the basic area of social sciences which is the ground of their research project:

- a) history and cultural studies
- b) law
- c) sociology and political science

- the PhD Program in which they want to develop their research project:

Africa

Central and Eastern Europe

Cultural Studies

European Studies

History of International Politics

History of Politics

International Law

Latin America

Migrations, Networks, Conflicts

Peace Studies

Political Science

Political Thought

United States of America

The application form and a reference letter format to be signed by a referee (compulsory) are available for downloading on the School's website (<http://host.uniroma3.it/dottorati/politiche/db>). All personal data will be kept as absolutely confidential.

On preparing the research project, candidates should consider the following.

The Doctoral School in Political Studies deems essential the candidate's research project planning skills. Although the subject of the thesis can be reconsidered and modified during the first year of the program, the Doctoral School in Political Studies gives preference to those candidates whose research project is very likely to be carried out successfully. Therefore, it is imperative for the candidates to have a clear vision of the issues to be discussed in the doctoral thesis. Candidates should specify in the research project its core elements as precisely and consistently as possible (at least 2.500 words). This process involves:

- selecting a research area that was already thoroughly investigated by the candidate;
- developing an appropriate methodology in order to analyse the selected issues properly;
- a convincing evaluation of the feasibility of the research project, considering both scientific and practical aspects (e.g., sources not readily accessible). Candidates should indicate precisely the available reference material to be used;
- a specific and selected bibliography allowing to assess the candidate's awareness of the most important trends of the international research with regard to the proposed subject.

DOCTORAL SCHOOL "TULLIO ASCARELLI" LAW - ECONOMICS - HISTORY

- 7** positions without fellowship (no fees requested):
- 3 positions → Criminal Law ("Sistemi punitivi" section)
 - 2 positions → Civil Law ("Diritto privato per l'Europa" section)
 - 1 position → Competition and Consumers Law ("Mercato e consumatori" section)
 - 1 positions → Public Law ("Diritto Amministrativo" section)

School Director: Prof. Salvatore Mazzamuto (scuola.ascarelli@uniroma3.it)

The International Doctoral School "TULLIO ASCARELLI" LAW - ECONOMICS - HISTORY, devoted to Higher Education, is also dedicated to scientific research in the various statutory fields it offers. The School, based on conventions established between universities, is divided into various multidisciplinary fields and sections.

The school offers different statutory fields:

Civil Law,
Commercial Law,
Labor Law,
Criminal Law,
Institutional Economics,
Business Economics,
Competition and Consumers Law,
Public Law,
International and EU Law.

Level of knowledge and official certificate of Italian language are required.

Contact: scuola.ascarelli@uniroma3.it - stefano.passera@uniroma3.it

Article 2

The competition is open to students who:

- (i) are not Italian citizens;
- (ii) are not residents of Italy;
- (iii) have gained (or will gain before 31 August 2012) an university degree or an equivalent degree of a higher education institution giving him/her access to doctoral studies without any further qualifications in the country where it was obtained. The equivalence of the degree with the Italian "Laurea Specialistica/Magistrale" will be evaluated by the Supervising Committee of the selected course;

Students who already obtained a doctoral (or equivalent level) degree are not eligible.

Article 3

To be admitted the candidate shall submit - by the term specified in the following article 5 - his/her application for ONLY ONE of the courses described above.

Article 4

For each course, the selection of candidates will be carried out by the Supervising Committee.

Except for those courses that require a specific list of documents, candidates will be selected on the basis of:

- ✓ (mandatory) university (or equivalent) degree
- ✓ (mandatory) abstract of the final thesis
- ✓ (mandatory) list of passed examinations
- ✓ (mandatory) curriculum vitae et studiorum
- ✓ (mandatory) a proposed research project
- ✓ (mandatory) at least three reference letters provided and signed by relevant members of the international scientific community, relating to the candidate's chosen course;

- ✓ (if any) additional document and/or publication (including GRE - Graduate Record Examination - test) that the candidate deems worthy of consideration, including associations to research institutions (MAX 05 documents).

Beside documents evaluation, specific courses may require an interview with candidates, in presence or by means of remote connection facilities (e.g. Skype); the tool exploited for the interview is selected by the examining commission and the candidate is asked to manage the availability of the tool at his/her location.

In order to sustain the interview, candidates will be asked to exhibit the same identity document attached to the application or other valid identification document in which they result clearly identifiable.

For each course, this selection will produce a pass-list, and suitable candidates for the different positions will be contacted with an official notification, that will be sent by e-mail before 30 November 2012.

To be admitted to the course the candidates shall deliver:

- formal documentation of qualifications as outlined in the application form;
- formal declaration of acceptance.

Only on receiving this documents they will be enrolled to the selected course (all starting 01 January 2013).

Article 5

Applications should be sent exclusively by WEB, filling the form (including the upload of the ".pdf" requested documents) available on-line at the address: <http://host.uniroma3.it/uffici/ricerca/> (FOREIGN STUDENTS CALL FOR APPLICATIONS).

The EXPIRATION DATE of the application is: 06 September 2012 (h. 14.00 CET TIME).

The administration of Roma Tre takes no responsibility for loss of communication due to possible errors either postal, Internet or otherwise not ascribable to the University itself. Roma Tre takes no responsibility for loss of communication due to inexact information regarding candidate's residence, postal or e-mail address, or to changes of address not communicated in good time.

Article 6

Doctorate Fellowships are incompatible with any other one granted by Italian or International subjects.

Doctorate Fellowships cannot be awarded to candidates who have already (either entirely or partially) benefited from a similar grant to attend a Ph.D. Course provided by an Italian University.

Article 7

Any other matters not included in the present call for application will be referred to the Italian legal regulations concerning doctorates ("corsi di dottorato di ricerca").

For any other information send an e-mail to dottorat@uniroma3.it

Rome, 20 July 2012

The President
Prof. Guido FABIANI

Rep. 1190/2012
Prot. 21185