

MATHEMATICS

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Academic year	2014/2015
Programme start date	01/10/2014
Duration	3 years
Language	Italian and English
Website	http://www.dm.unibo.it/dottorato/
Mandatory mobility abroad	YES (3 months)
Research topics	
<ul style="list-style-type: none"> • Partial differential equations, • Calculus of variations, • Probability theory, • Algebraic geometry, • Commutative algebra, • Complex analysis, • Algebraic topology, • Combinatorics, • Group theory, • Continuum mechanics, • Electromagnetic theory, • Superconductivity, • Statistical Mechanics, • Quantum mechanics, • Dynamical systems and ergodic theory, • Numerical methods for the solutions of large linear and nonlinear systems, • Mathematical finance, • Numerical methods for inverse problems and image processing. 	
Admission requirements	
<p>Applicants of any Country and age holding a Master's degree (second cycle) can submit their application. Such degree must be either:</p> <ul style="list-style-type: none"> • an Italian university degree pre-reform system ("vecchio ordinamento"); • an Italian university degree (laurea specialistica/magistrale - 3+2 years or combined degree BA+MA); • an academic Master's degree conferred by foreign institutions/Universities, validated as equivalent (equipollente) to an Italian degree by the Italian Ministry of Education, University and Research (MIUR) or acknowledged as equivalent by the Admission Board for the sole purpose of the selection. <p>Applicants whose degree are to be awarded after the deadline of the call can participate in the selection but the admission is conditional on obtaining a Masters' degree before the official start date.</p> <p>To be eligible for the Marie Curie ITN "MANET" positions, each researcher must simultaneously fulfill the following criteria at the time of recruitment by the beneficiary.</p> <p>(a) Nationality: The researcher may be of any nationality.</p> <p>(b) Mobility: At the time of recruitment by the beneficiary, the researcher must not have resided or carried out his/her main activity (work, studies, etc...) in Italy for more than 12 months in the 3 years immediately prior to his/her recruitment under the project. Compulsory national service and/or short stays such as holidays are not taken into account.</p> <p>(c) Research Experience: at the time of recruitment the researcher: has not yet been awarded the doctorate degree and is in the first 4 years (full-time equivalent) of his/her research career.</p> <p>(d) research interest with the research area of the project.</p>	
Documents to be attached mandatorily (Artt. 2 and 3 of the call for applications)	
<ul style="list-style-type: none"> • copy of a valid ID with photo • Curriculum Vitae in English • Degree transcripts of both BA/BSc and MA/MSc: <ul style="list-style-type: none"> – for degrees obtained in Italy, please submit a signed self-declaration (<i>autocertificazione</i>); – for degrees obtained in non-EU countries, please submit the degree certificate issued by the relevant University; – for degrees obtained in EU countries (except Italy), you can do either. <p>The document must, in any case, contain the following information:</p> <ul style="list-style-type: none"> – personal data, – University details, – degree name, 	

- final score,
- transcript of results obtained.

For degree transcripts from outside of Italy, an official translation into Italian or English must be attached. Graduands have to submit the document(s) as above except for the Master's degree and final score.

- Title, index and abstract in Italian or English (max 5000 characters not including bibliography and illustrations) of the graduation Master's thesis; for graduands: title, index and abstract of the graduation Master's thesis' draft approved by the Supervisor.
- At least one and no more than three letters of reference from national or international academic referee and/or research professionals declaring the applicant's interest and skills in research; please do not attach the letters to the application: the instructions available on Studenti Online (<http://studenti.unibo.it>) shall be followed;

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(c) Research Experience: at the time of recruitment the researcher: has not yet been awarded the doctorate degree and is in the first 4 years (full-time equivalent) of his/her research career.

(d) research interest with the research area of the project.

Other attachments, if any

- Publications (monographs, articles on scientific magazines, etc) (max 2);
- Other publications (conference proceedings distributed at national and international level, contributions in monographs, etc.); (max 2)
- List of other publications (conference proceedings distributed at national and international level, contributions in monographs, etc.)
- List of abstracts and posters presented in national and international conferences
- Other Master's and/or specialization degree in subjects consistent with the research topics of this PhD programme;
- Language certificates
- Mobility experience abroad (e.g.: Erasmus or similar)
- Any other document certifying the applicant's excellence (prizes, fellowships and grants)

Entrance examinations (Art. 4 of the call for applications)

Examinations	Timetable (applicants will not receive any further communication)	Publication of results (no personal written communication shall be provided to applicants concerning the examinations results)
Evaluation of qualifications	Applicants' presence is not requested	The evaluation of qualifications results will be available on 01/07/2014 on http://studenti.unibo.it (select: sintesi delle richieste in corso → vedi dettaglio).
Oral examination	When	14/07/2014 Please note that the oral examinations might take more than one day. In this case the relevant timetable will be published on http://studenti.unibo.it together with the evaluation of qualifications and research projects results.
	Where	Bologna - Piazza di Porta S. Donato 5 Dept of Mathematics
	Time	09:00 CET
<p>For applicants residing abroad, the oral examination can be conducted at a distance through video-conference based on the IP protocol (such as through Skype with webcam). Applicants must clearly indicate such choice and provide their own ID when applying for the call. The request must, nonetheless, be approved by the Admission Board which will make sure that the examination is carried out correctly and upon verification of the identity of each applicant. A specific timetable regarding distance oral examinations will be available on http://studenti.unibo.it together with the results confirming the admission to such examination. Applicants must guarantee their availability for 3 hours, starting from the time indicated in the above mentioned timetable. In case of unavailability, after 3 attempts from the Admission Board in establishing a contact during the agreed timeframe, applicants will be excluded from the oral examination. All oral examinations, included the remote ones, are public.</p>		

Assessment criteria

The recruitment process will be in line with the principles set out in the European Charter for Researchers and in the Code of Conduct for the Recruitment of Researchers.

Scores will be expressed in points out of 100, as follows:

1. Evaluation of qualifications and research project

- Minimum score required for the admission to the oral examination: 30
- Maximum score: 50

Only qualifications and documents consistent with the research topics and no older than 5 years (up to the deadline of this call for applications) - Bachelor's and Master's degrees excluded - will be taken into consideration.

Score will be assigned as follows:

- Evaluation of the degree mark (for applicants who have a university degree at the time of submission of the application) or evaluation of the university exams taken with grades (for applicants who still not have a Master's degree at the time of submission of the application): max 20 points;
- Publications: max 5 points
- Cv: max 20 points
- Reference letters: max 20 points
- Other qualifications: max 5 points

If the score totals up to more than 50, the maximum of 50 points will be assigned.

2. Oral examination

- Minimum score: 30 points
- Maximum score: 50 points

The oral examination will assess:

- the applicant's aptitude for scientific research,
- her/his knowledge of the research topics related to the doctoral programme
- the consistency of the previous research experiences with the research topics.

During the oral examination, the applicant's knowledge of English will be assessed.

The oral examination can be held either in Italian or English, depending on the applicant's choice.

Scores will be assigned according to the following criteria:

- knowledge of foreign language: max 1 points
- aptitude for research: max 49 points

The Admission Board might add other sub-criteria before the assessment process. In this case, a proper announcement will be posted on <http://studenti.unibo.it>

Ranking list and enrolment (Art.6 of the call for applications)

Applicants obtaining a total score of at least 60/100 are eligible and will be included in the final ranking list.

The Rectoral Decree containing the final ranking list will be published on <http://studenti.unibo.it> accessible with Unibo username and password.

No personal written communication shall be provided to applicants concerning the final results and the deadlines for enrolment.

Selected applicants will have to enrol by the date indicated in the above mentioned Rectoral Decree.

Positions and scholarships

Total available positions (no. with scholarship + no. without scholarship)	10
Positions with scholarship , financed by	8
University of Bologna	4
Reserved positions	2 reserved to Iraqi applicants who benefit from scholarships financed by the Ministry of Higher Education and Scientific Research of the Republic of Iraq. 2 research grants reserved to MAnET Marie Curie Initial Training Network (ITN) devoted to the training of young researchers on new frontier of mathematics and its applications, of which 1 position focus on Intrinsic differential forms on CC groups and differential operators The problem is significantly different from the Euclidean one, since the exterior differential in this setting called Rumin differential is a non-homogeneous higher order differential operator. 1 position focus on PDEs in Lie groups, and application to models of the visual cortex subriemannian Quasilinear parabolic equations in Lie groups will be studied, and in particular curvature flows. Applications to model of the visual cortex will be considered
Positions without scholarship	2