

FUTURE EARTH, CLIMATE CHANGE AND SOCIETAL CHALLENGES

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Programme starting date	01/11/2020
Duration	3 academic years
Language	Italian and English
Mandatory mobility abroad	Yes (3 months)

Research topics

A. The earth system	<p>The natural and man induced variability is considered</p> <ul style="list-style-type: none"> - Solid earth physics - Observations of the atmosphere, oceans and ecosystems - Climate variations and modeling - Atmospheric and ocean predictions - Water and hydrology - Carbon cycle and biogeochemical cycles - Paleoclimate - Hazard mapping and extreme events
B. Impacts, adaptation and vulnerability	<p>The role of humans in managing resources and the socio-economic impacts of climate change.</p> <ul style="list-style-type: none"> - Food production and security - Water resources and security - Biodiversity, environment and nature conservation - Human Health and Well-Being - Economics of adaptation - Resilient agriculture - Cultural heritage conservation - Recovery and reuse of materials
C. Technological innovations for a decarbonized society	<p>The mitigation and adaptation technological developments required by the industrial sectors.</p> <ul style="list-style-type: none"> - Energy and environmental efficient systems - Renewable energy systems and products - Green/blue/hybrid architecture - Smart grids and positive energy districts - Transport innovation - Low carbon technologies - Sustainable chemistry and engineering - Industrial and Urban Symbiosis
D. Socio-economic and legal studies for mitigation of climate change	<p>The effects of mitigation policies on economic growth and government/rulemaking.</p> <ul style="list-style-type: none"> - Social, Economic, and Ethical Concepts and Methods - Sustainable Development and Equity - International Cooperation - Regional Development and Cooperation - Cross-cutting Investment and Finance issues - Environmental law - Circular economy - Communicating Climate Change

Positions and scholarships

Position n.	Financial support	Description	Positions linked to research subjects
1	PhD Scholarship	Totally funded by the University of Bologna general budget	Physics of the solid earth: All aspects of solid earth geophysics, such as seismology, volcanism physics, geodesy, quantitative geodynamics and tsunami
2	PhD Scholarship	Totally funded by the University of Bologna general budget	Infrared remote sensing and derivation of atmospheric properties

3	PhD Scholarship	Totally funded by the University of Bologna general budget	Climate change and societal challenges: policies, communication and risk management
4	PhD Scholarship	Totally funded by the University of Bologna general budget	Influence of climate change on degradation mechanisms of the constituent materials of cultural heritage infrastructures
5	PhD Scholarship	Funded by the University of Bologna general budget and co-funded by the Department of Physics and Astronomy	Coupled numerical modeling of the circulation and marine biogeochemical cycles
6	PhD Scholarship	Funded by the Department of Physics and Astronomy	Numerical coastal modelling for coupled circulation and sediment transport processes
7	PhD Scholarship	Funded by the Department of Physics and Astronomy	Artificial intelligence applied to SAR images for the identification of landslide processes
8	PhD Scholarship	Funded by the Department of Physics and Astronomy	Effect of the seasonal variation of the soils on seismic microtremor: seismo-stratigraphic implications
9	PhD Scholarship	Co-funded by the Department of Chemistry "G. Ciamician" and the Department of Industrial Chemistry "Toso Montanari"	Separation and recycling of metals in municipal and industrial waste
10	PhD Scholarship	Funded by the Department of Agricultural and Food Sciences with funds made available by the project EU FoodE (Food Systems in European Cities - Prof. Francesco Orsini)	Innovative technologies for urban agriculture
11	PhD Scholarship	Funded by the Department of Cultural Heritage with funds made available by the project IMPACT HAU - ERC n.772544 H2020 (Prof. Brightman)	Anthropology of climate finance
12	PhD Scholarship	Funded by the Department of Physics and Astronomy under the "Progetti di Sviluppo Strategico dei Dipartimenti (PSSD) - COFIN PSSD" initiative	Analysis and modeling of multimodal data for the solid Earth
13	Industrial doctorate	posto riservato a dipendenti della Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC)	
14	Industrial doctorate	Position reserved for employees of Curti Costruzioni Meccaniche S.p.a.	
15	PhD Scholarship	Funded by Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC)	Downscaling of seasonal forecasts for coastal areas of the ocean
16	PhD Scholarship	Funded by Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC)	Marine pollution modeling and risk mapping
17	PhD Scholarship	Funded by Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC)	Wave induced mixing processes and their parameterization in coupled numerical models
18	PhD Scholarship	Funded by CNR-ISAC	Study of short-lived polluting compounds in the atmosphere
19	PhD Scholarship	Funded by INGV - Istituto Nazionale di Geofisica e Vulcanologia	Reconstruction of the material and social impact of extreme natural events of the past (earthquakes, volcanic eruptions, tsunamis, meteorological events, etc.)

Positions linked to specific research subjects: during the oral test, applicants may express their interest in one or more positions linked to specific research subjects. Considering the expressions of interest above, the Admission Board shall express its view on the suitability of the interested applicants, taking into account their specific skills, experience and aptitude.

Admission requirements		
Please, see art. 2 of the Call for applications		
Mandatory documents to be attached to the application		
Please, see art. 3 of the Call for applications		
Further qualifications that may be attached to the application, if in possession of the applicant (only qualifications attested by documents drawn up in Italian, English, French, German and Spanish shall be considered as valid and assessed by the Admission Board)		
<ul style="list-style-type: none"> - Abstract of the second cycle master's degree thesis. Undergraduate applicants may submit the draft of the thesis approved by their supervisor (please, note that abstracts cannot exceed 5.000 characters, including spaces and formula possibly used. The above figure does not include: the title of thesis, the outline, and images such as graphs, diagrams, tables etc. – where present); - At least one and no more than 2 reference letters signed by academics and professionals in the research field, which do not form part of the Admission Board, attesting the suitability of the applicant and his/her interest for the scientific research. <u>Please, note that the above letters cannot be uploaded by applicants. When filling the online application form on http://studenti.unibo.it, applicants will be only allowed to provide the email accounts of the requested academic/professional. The latter shall receive an email from the University of Bologna providing for the instructions for uploading. Only letters in pdf format submitted before the expiry date and time of the Call shall be accepted.</u> - Multi-annual research project, with special emphasis on the activities to be completed during the first-year course. The proposal must meet the following requirements: <ul style="list-style-type: none"> o It must indicate in the cover page the topic of the research project proposal and for which the applicant is applying o It cannot exceed 20.000 characters, including spaces and formula possibly used. This figure does not include: the title of project, the outline, references and images (such as graphs, diagrams, tables etc - where present); o It must include: the state of the art; description of the project; expected results; lead-time for implementation; (proposed) criteria to be used to assess the findings obtained; references. <p>The research projects that successful applicants shall carry out during their doctoral career may possibly differ from the project proposed at the application stage. This shall be defined together with the supervisor and approved by the Academic Board.</p> - Motivation letter. This must include the reasons prompting the applicant to attend the PhD Programme and those relevant experiences and research interests, that make the applicant suitable for the specific PhD Programme (3000 characters maximum, including spaces). - List of the publications (monographs, articles published on scientific journals, volume's chapters). - List of the minor publications (conference papers, etc.). - List of abstracts and posters at national and international congresses. - Professional Master courses relevant to the PhD Programme. - Postgraduate vocational training programmes/3rogetto3ne3on programmes relevant to the PhD Programme. - Teaching activity carried out at university level. - Research activity of any kind – whether basic, applied, translational, etc. – carried out in any capacity, including when covered by research grants, and as a staff member of research projects. - Working activity. - Documents attesting the knowledge of foreign languages. - Study periods completed abroad (e.g. Erasmus programme or other similar mobility programmes). - Other qualifications attesting the suitability of the applicants (scholarships, prizes, etc). 		

Admission exams (art. 4 of the call for applications)		
Examination type	Schedule (please, note that applicants shall not receive any communication concerning the exams schedule)	Examination results publication (please, note that applicants shall not receive any communication concerning the publication of results)
Qualifications and research project evaluation	Non-presential.	The results of the qualifications and research project evaluation shall be available online starting from the 26/06/2020 at the page http://studenti.unibo.it (please, select “summary of the requests in progress” – “see detail” and open the pdf file “risultati valutazione titoli e progetto”)

Oral examination	Date	06/07/2020 In case that the oral examination cannot be completed in one day due to the large number of applicants, the oral exam schedule shall be made available at the webpage http://studenti.unibo.it together with the results of the qualifications and research project evaluation	The results of the oral examination shall be available on the webpage http://studenti.unibo.it starting from 14/07/2020 (please, select “summary of the requests in progress” – “see detail” and open the pdf file “risultati prova orale”)
	Time	09:30 am (local time)	
Applicants shall take the exam remotely. For further details please refer to the relevant provision laid down in art. 4 of the Call for applications.			

Evaluation criteria

Points will be allocated to applications out of a total of 100 on the basis of the following weighting:

- 1. Qualifications and research project**
- Minimum for admission to the oral exam: 30 points
 - Maximum: 50 points
- Only qualifications relating to the last 5 calendar years prior to the calendar year of publication of the Call for applications shall be taken into consideration, with the exception of the University Degree (Diploma di laurea). Please, note that qualifications must be consistent with the PhD Programme.

Points relating to qualifications shall be allocated on the basis of the following criteria:

- Master’s Degree final mark. Undergraduates shall be evaluated on the basis of the Weighted Average Mark (WAM): max 7 points
- Master’s degree thesis abstract: max 8 points
- Research project: max 8 points
- Reference Letters: max 8 points (2 letters are recommended)
- Publications: max 3 points
- Motivation Letter: max 5 points
- Specializations, teaching activity carried out at a University level, work experience: max 4 points
- Documents attesting the knowledge of foreign languages and periods spent abroad for study purposes (e.g. Erasmus, etc.): max 5 points
- Other qualifications: max 2 points

- 2. Oral examination**
- Minimum for inclusion in the final ranking list: 30 points
 - Maximum: 50 points
- Oral examination is intended to assess the suitability of the applicant in respect of the pursuing of scientific research as well as the general knowledge of issues connected to the PhD Programme.
During the oral examination, knowledge of English language shall be assessed.
The oral examination is carried out in Italian or in English.

Points relating to the oral examination shall be allocated on the basis of the following criteria:

- Knowledge of the English language: max 5 points
- General knowledge of issues connected to the PhD Programme: max 45 points

Possible evaluation sub-criteria will be available on the [Unibo website](#), selecting the relevant PhD Programme → “PhD programme information” at the bottom of the page in the section “Notices”.

Final ranking list and enrolment (arts.6 and 7 of the Call for applications)

After the publication of the results of the oral exam, the final ranking list will be available on the [Unibo website](#), selecting the relevant PhD Programme → “PhD programme information” at the bottom of the page in the section “Notices”.
Following the publication of the final ranking list, successful applicants must enroll on <http://studenti.unibo.it> by the deadline indicated on the [Unibo website](#), selecting the relevant PhD Programme → “PhD programme information”.