

PHD PROGRAMME TABLE 38TH CYCLE

Section “Available Positions and Scholarships” integrated on 23/05/2022

Section “Available Positions and Scholarships” modified on 27/05/2022

Section “Available Positions and Scholarships” modified on 07/06/2022

PROGRAMME’S NAME	FUTURE EARTH, CLIMATE CHANGE AND SOCIETAL CHALLENGES
DURATION	3 years
PROGRAMME START DATE	01/11/2022 (DD/MM/YYYY)
LANGUAGES	English
MANDATORY STAY ABROAD	3 months
COORDINATOR	Prof.ssa Nadia Pinardi (nadia.pinardi@unibo.it)
CURRICULA	<ol style="list-style-type: none"> 1. One Health 2. The Earth System 3. Impacts, Adaptation and Vulnerability 4. Technological Innovations for a Decarbonized Society 5. Socio-economic and Legal Studies for Mitigation of Climate Change
RESEARCH TOPICS	Detailed list at the bottom of the present document
PHD POSITIONS	22
ADMISSION PROCEDURE	Qualifications and research proposal evaluation Oral examination

Available Positions and Scholarships

Pos. n.	Financial Support	Description	Positions linked to research topics
1	PhD Scholarship	Totally funded by the University of Bologna general budget	All aspects of solid earth geophysics, such as seismology, physics of volcanism, geodesy, quantitative geodynamics, including tsunami
2	PhD Scholarship	Co-funded by the University of Bologna general budget finanziata and the Department of Industrial Chemistry “Toso Montanari”	Synthesis, characterisation and application of new Cu-based Metal-Organic Frameworks (MOFs)
3	PhD Scholarship	Funded by the Department of Physics and Astronomy with IFAC - Istituto di Fisica Applicata “Nello Carrara”	Analysis of the potential use of atmospheric radiance measured by new space missions such as FORUM (Far-infrared Outgoing Radiation Understanding and Monitoring) and CAIRT (Changing-Atmosphere Infra-Red Tomography) of the ESA Earth Explorer to study the atmospheric circulation and climate change
4	PhD Scholarship	Funded by the Department of Statistical Sciences “Paolo Fortunati” with funds made available by the EU project ERC H2020 “Population Dynamics under Global Climate Change – POPCLIMA” (Grant Agreement n. 101002973), with foreseen duration of 60 months within the Framework Programme HORIZON 2020, main partner Alma Mater	Assessing the impact of climate change on human fertility behaviour

		Studiorum – Università di Bologna, Principal Investigator Prof. Raya Muttarak. The POPCLIMA project was kicked off on 01/01/2022.	
5	PhD Scholarship	Funded by the Department of Statistical Sciences “Paolo Fortunati” with funds made available by the EU project ERC H2020 “Population Dynamics under Global Climate Change – POPCLIMA” (Grant Agreement n. 101002973), with foreseen duration of 60 months within the Framework Programme HORIZON 2020, main partner Alma Mater Studiorum – Università di Bologna, Principal Investigator Prof. Raya Muttarak. The POPCLIMA project was kicked off on 01/01/2022.	Assessing the impact of climate change on human mortality patterns
6	PhD Scholarship	Funded by Istituto Nazionale di Geofisica e Vulcanologia (INGV)	Neural network/time reversal/source scanning methods for detection and location of micro-earthquakes
7	PhD Scholarship	Funded by Istituto Nazionale di Geofisica e Vulcanologia (INGV)	Seismic noise for monitoring crustal variations and determination of shallow earth structure
8	PhD Scholarship	Funded by Istituto Nazionale di Geofisica e Vulcanologia (INGV)	Development of decision support tools based on geophysical data
9	PhD Scholarship	Funded by Istituto Nazionale di Geofisica e Vulcanologia (INGV)	Complex tsunami modeling: earthquake and generation, propagation and flooding
10	PhD Scholarship	Funded by Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC)	Southern European Seas interannual to decadal variability
11	PhD Scholarship	Funded by Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC)	Modelling the ocean litter: numerical simulations and hazard mapping
12	PhD Scholarship	Funded by Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC)	Coastal ocean modelling in support of marine nature based solutions
13	PhD Scholarship	Funded by Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC)	Exploration and quantification of the role of macrophytes in the mitigation of climate change, its blue carbon potential and co-benefits in a physical-biogeochemical modelling framework
14	PhD Scholarship	Funded by Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC)	Impacts of the Earth System Models’ systematic error on teleconnections
15	PhD Scholarship	Funded by Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC)	Ocean predictions and data assimilation
16	PhD Scholarship	Funded by Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC)	Interdependent role of radiative forcing, land-use and land management on present and future climate scenarios
17	PhD Scholarship	Totally funded by the University of Bologna general budget	Low frequency variability of the large scale ocean circulation and its links to the Mediterranean circulation

18	PhD Scholarship	Totally funded by the University of Bologna general budget	New Strategies for the Conservation of Cultural Heritage under Climate Change conditions
19	PhD Scholarship	Funded by the Department of Physics and Astronomy in collaboration with CNR ISAC and Serco Italia S.p.A.	The ESA Earth Explorer 9 mission FORUM: study of its performances and impact on climate and weather forecast models
20	PhD Scholarship	Co-funded by the University of Bologna general budget and the Department of Physics and Astronomy with funds made available by the project HORIZON - Individual Change of HABits Needed for Green European transition - I - CHANGE. N. 101037193	Assessment of weather numerical models for the prediction of meteo-related extremes in the Po Valley
21	Executive PhD	PhD position reserved for employees of Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC)	Numerical Modelling of the Mediterranean Sea
22	PhD Scholarship	Funded by Istituto Nazionale di Geofisica e Vulcanologia (INGV)	LOFAR for space weather ionospheric effects

Admission Exams

	DATE AND TIME	RESULTS
Qualifications and research proposal evaluation	Applicants' participation is not required	Available from 17/06/2022**
Oral examination	Date: starting from 04/07/2022 – 9.00 a.m. CEST* Place: In presence, Department of Physics and Astronomy, Viale Berti Pichat 6/2, Bologna. Remotely, using Microsoft Teams	Available from 11/07/2022**

* In case that the oral examination cannot be completed in one day due to the large number of applicants, the oral examination detailed schedule shall be made available on the webpage [Studenti Online](#) together with the results of the qualifications and research proposal evaluation. **During the oral examination, applicants may express their interest in one or more positions linked to specific research topics.**

** The **results of the admission exams** will be available on the webpage [Studenti Online](#) (select “summary of the requests in progress” > “see detail” and open the .pdf file at the bottom of the page). **No personal written communication will be sent to applicants concerning the examinations results.**

Required and Supporting Documents to be attached to the application

All the documents listed below **shall be drawn up in English or in Italian**. In case of documents originally issued in any other language (e.g. identity document, qualifications), an official translation is required.

Only qualifications obtained **during the last 5 calendar years** shall be taken into consideration, except for the University Degree. The Admission Board will assess the relevance of the supporting documents to the PhD Programme.

REQUIRED DOCUMENTS	
Identity document	Valid identity document with photo (i.e. identity card, passport)
Curriculum Vitae	No specific CV format is required
Degrees	Documents attesting the awarding of the first and second cycle degrees, the exams taken and the marks obtained (see Art. 3 of the Call for Applications)
SUPPORTING DOCUMENTS	
Research proposal	Multi-annual research proposal, 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"> - it must mention on the cover page the Curriculum and the main research topic/s the applicant is interested to and the proposal is about;

	<ul style="list-style-type: none"> - it cannot exceed 20,000 characters, including spaces and formula possibly used. This figure does not include: the title of proposal, the outline, references and images (such as graphs, diagrams, tables, etc. - if present); - it must include: the state of the art; description of the proposal; expected results; articulation of the proposal and implementation times; outline of the proposed findings assessment criteria; references. <p>The research proposal that successful applicants shall carry out during their PhD career may possibly differ from the one proposed at the application stage. This shall be defined together with the supervisor and approved by the Academic Board.</p>
Thesis abstract	Abstract of the second cycle degree thesis . Graduands applicants may submit the draft of the thesis. Abstracts cannot exceed 5,000 characters, including spaces and formula possibly used. The above figure does not include: the title of the thesis, the outline, references, and images such as graphs, diagrams, tables etc.
Personal statement	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 (3,000 characters maximum, including spaces).
Reference letter/s	No more than 2 reference letters signed by Italian and international 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 in the scientific research. Letters shall be uploaded following the procedure, detailed in the Call for Applications (Art. 3.2).
Publications	Lists of publications (i.e. monographs, articles on scientific journals), minor publications (conference papers, etc.), abstracts and posters presented during national and international conferences, etc.
Other documents	<ul style="list-style-type: none"> - Postgraduate vocational training programmes and/or specialisation programmes relevant to the PhD Programme main research topics - Specialisation thesis - Teaching activity carried out at academic 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 - Work activities - Documents attesting the applicant's foreign languages proficiency - Study periods completed by applicants outside their countries of origin (e.g. Erasmus programme or other similar mobility programmes) - Other qualifications attesting the suitability of the applicants (scholarships, prizes, etc.)

Evaluation criteria*

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

1. Qualifications and research proposal evaluation

Minimum score for admission to the oral examination: 30 points, Maximum score: 50 points

Second cycle degree (Master's) final mark. Graduands shall be evaluated according to the Weighted Average Mark (WAM)	9 points max
Thesis abstract	8 points max
Research Proposal	8 points max
Reference letter/s	6 points max
Publications	4 points max
Personal Statement	5 points max
Postgraduate programmes, Teaching and Work activity	4 points max
Foreign languages proficiency and study period abroad	4 points max
Other evaluable documents	2 points max

2. Oral examination

Minimum score for eligibility: 30 points, Maximum score 50 points

English language proficiency	5 points max
General knowledge of issues encompassed by the PhD Programme	45 points max

Oral examination aims to assess the suitability of the applicant for scientific research as well as the general knowledge of issues encompassed by the PhD Programme (see the list of [research topics](#) at the bottom of the present document).

During the oral examination, the applicant's English language proficiency shall be assessed.

The oral examination is carried out in Italian or English.

* Possible further evaluation criteria will be available on the [University website](#), selecting the relevant PhD Programme > "More information", at the bottom of the page in the section "Notices".

Research Topics

Curriculum 1. One Health

- Biodiversity loss and environmental impacts on health
- Environmental health risk factors, Nutrition and health/disease determinants
- Antimicrobial resistance at human/animal/environmental interfaces
- Environmental health risks and law
- Climate change and emerging infectious diseases
- Microbiome at human/animal/environmental interfaces
- Food and water safety, sustainable food production, waste management
- Urban environment and human-animal relationships
- Diseases impact and management strategies at socio-economic and environmental levels
- Artificial intelligence applied to epidemiological and environmental data

Curriculum 2. The earth system

- 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
- Machine Learning applied to earth system data

Curriculum 3. Impacts, adaptation and vulnerability

- Food production and security
- Water resources and security
- Biodiversity, environment and nature conservation
- Economics of adaptation
- Resilient agriculture
- Cultural heritage conservation
- Recovery and reuse of materials

Curriculum 4. Technological innovations for a decarbonized society

- 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

Curriculum 5. Socio-economic and legal studies for mitigation of climate change

- 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