Coordinator: Prof. Andrea Cavalli  
Department of Pharmacy and Biotechnology  
Via Belmeloro 6 - Bologna  
andrea.cavalli@unibo.it

Starting date of the PhD Programme: 01/11/2019

Duration: 4 calendar years

Language of the PhD Programme: Italian and English

Mandatory stay abroad: Yes (3 months)

Associated partners pursuant to art. 2, para 2, lett. d) of the M.D. n. 45/2013: Politecnico di Milano and Fondazione Golinelli

Research topics:
1. Quantitative Finance and Economics
2. Materials and Industry 4.0
3. Genomics and bioinformatics
4. Personalised medicine
5. Hardware and Infrastructure
6. Machine learning and deep learning
7. Computational physics
8. Big Data, Smart Cities & Society

PhD positions and scholarships:

<table>
<thead>
<tr>
<th>Position n.</th>
<th>Financial support</th>
<th>Description</th>
<th>Positions linked to research subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PhD Scholarship</td>
<td>Totally funded by the University of Bologna general budget</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>PhD Scholarship</td>
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<td>3</td>
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</tr>
<tr>
<td>4</td>
<td>PhD Scholarship</td>
<td>Financed by the Politecnico di Milano</td>
<td>Innovative solutions and techniques for advanced and efficient analysis of large amounts of data</td>
</tr>
<tr>
<td>5</td>
<td>PhD Scholarship</td>
<td>Financed by the Fondazione Istituto Italiano di Tecnologia (IIT) on behalf of the Politecnico di Milano</td>
<td>Genomics and Bioinformatics; Personalized medicine; Computational Physics</td>
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<td>PhD Scholarship</td>
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<td>Genomics and bioinformatics</td>
</tr>
<tr>
<td>8</td>
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<td>PhD Scholarship</td>
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</tr>
<tr>
<td>12</td>
<td>PhD Scholarship</td>
<td>Financed by the Istituto Nazionale di Fisica Nucleare (INFN)</td>
<td>Computational Physics</td>
</tr>
<tr>
<td>13</td>
<td>PhD Scholarship</td>
<td>Financed by the Istituto Nazionale di Fisica Nucleare (INFN)</td>
<td>Computational Physics</td>
</tr>
<tr>
<td>14</td>
<td>Research grant</td>
<td>provided by the Department of Electrical Energy and Information Engineering &quot;Guglielmo Marconi&quot; with funds from CINECA – Principal investigator Prof. Luca Benini</td>
<td>Scalable power and energy monitoring and control of HPC systems based on machine learning and computing</td>
</tr>
</tbody>
</table>
with a duration of 12 months renewable up to a maximum of 36 months and a gross percipient amount of €19,367

| 15 | Industrial doctorate | position reserved to employees of CINECA | Co-design of efficient, high-performance computing architectures and applications |

**Positions linked to specific research subjects:** during the oral examination applicants may express their interest in one or more positions linked to specific research subjects. Considering the expressions of interest above, the Admission Board will establish if the applicants can be considered eligible for the allocation of the positions linked to specific research subjects, taking into account their 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)

- 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);
- No more than 3 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 for the scientific research.
  
  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.
- 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:
  o It must indicate in the cover page the research topic of the PhD Programme covered by 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.
  
  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.
- List of the publications (monographs, articles published on scientific journals).
- List of the minor publications (conference papers, volume’s chapters, etc.).
- Professional Master courses completed in Italy (1st or 2nd level) relevant to the PhD Programme.
- Postgraduate vocational training programmes/specialisation programmes relevant to the PhD Programme.
- 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 activity;
- Documents attesting the knowledge of foreign languages
- Study periods completed by students 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.).

**Admission exams** (art. 4 of the call for applications)

<table>
<thead>
<tr>
<th>Examination type</th>
<th>Examination results publication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qualifications and research project evaluation</td>
<td>(please, note that applicants shall not receive any communication concerning the exams schedule)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Schedule (please, note that applicants shall not receive any communication concerning the exams schedule)</th>
</tr>
</thead>
</table>
| Non-presential.  | The results of the qualifications and research project evaluation shall be available online starting from the 14/06/2019 at the page http://studenti.unibo.it (please, select: (please, select “summary of the requests in progress” - “see detail” and open the pdf file “risultati valutazione titoli e
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 starting from 01/07/2019 (please, select “summary of the requests in progress” - “see detail” and open the pdf file “risultati prova orale”).

The results of the oral examination shall be available on the webpage http://studenti.unibo.it.

Applicants can ask to take the exam remotely using Skype. 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:
   - Graduation final mark. Undergraduates shall be evaluated on the basis of the Weighted Average Mark (WAM): max 20 points
   - Publications: max 3 points
   - Other qualifications: max 2 points

   Points relating to the research project shall be allocated on the basis of the following criteria:
   - Scientific value and ground-breaking nature of the proposal: max 10 points
   - Description and structure of the proposal: max 10 points
   - Proposal feasibility: max 5 points

2. **Oral examination**
   - Minimum for inclusion in the final ranking list: 30 points
   - Maximum: 50 points

   Oral examination includes the presentation of the research project and is intended to assess the suitability of the applicant to pursue 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.

   Points relating to the oral examination shall be allocated on the basis of the following criteria:
   - Knowledge of the English language: max 10 points
   - Research project presentation: max 20 points
   - General knowledge of issues connected to the PhD Programme: max 20 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 enrollment (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](http://studenti.unibo.it) by the deadline indicated on the **Unibo website**, selecting the relevant PhD Programme → “PhD programme information”.

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<table>
<thead>
<tr>
<th>Oral examination</th>
<th>24/06/2019</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Date</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Place</strong></td>
<td>Department of Pharmacy and Biotechnology, Via Belmeloro 6 - Bologna</td>
</tr>
<tr>
<td><strong>Time</strong></td>
<td>12 a.m.</td>
</tr>
</tbody>
</table>

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