Faculty of Science and Engineering

Profile report: Assistant Professor (education profile) in Computational Biology; universitair docent (onderwijsprofiel) Computationele Biologie.

- Disciplines: Computational Biology, Molecular Dynamics Simulations, Computational Enzyme (re)Design, Metabolic network modeling.
- Level: Tenure-track assistant professor
- Fte: 0,8-1,0 fte

1. Scientific discipline
The position is in the discipline of Computational Biology, broadly defined as using data-analytical, theoretical, mathematical modeling, computational simulation techniques and/or artificial intelligence/machine learning approaches focusing at the understanding and (re)design of biological systems at the molecular scale. The position is aimed at either protein structure prediction, protein design, ligand docking, metabolic flux analysis or molecular dynamics simulations of proteins, membranes or nucleic acids.

2. Vacancy
This position is opened by the Board of the Faculty *(PT/gl/22/00181)* and will be embedded in the Groningen Biomolecular Sciences and Biotechnology Institute (GBB). The criteria and conditions pertaining to the position are described in the document 'Assistant professor with an education profile'.

3. Selection committee (BAC)
● Prof.dr. Dirk-Jan Scheffers (chair, Director of Education GBB)
● Prof.dr. Dirk Slotboom (Scientific Director GBB)
● Dr. Kasia Tych (Coordinator of and strong involvement in computational courses)
● Prof.dr. Marco Fraaije (Program Director Biomolecular Sciences)
● Prof.dr. Shirin Faraji (Zernike Institute of Advanced Materials)
● Prof.dr. Bas van Breukelen (Bioinformatics, Utrecht University, external educational expert)
● Student member (to be assigned, e.g. from computational group at GBB or Zernike Institute)

Additional advisors:
● Prof.dr. Marc van der Maarel (Director School of Science and Engineering)
● Prof. dr. Sander van Doorn (Programme director BSc Biology)
● Prof.dr. Wesley Browne (Programme director BSc Chemistry)
● Prof.dr. Siewert-Jan Marrink (Molecular Dynamics, GBB)
● Dr. Max Furst (Computational Protein (Re)Design, GBB)
● Mrs. Mariska Laning (HR)
● Dr. Engel Vrieling (secretary)

4. Area of expertise

Within the educational programmes in Biology, Chemistry, and Life Sciences & Technology, there is a clear need for additional staff capacity to teach computational courses and to integrate computational skills in already existing courses. The discipline specific use of computational tools makes it imperative to have someone teaching who can provide students with relevant theoretical and practical material that is suited to their study programme. Thus, we are looking for a computational scientist with a background in, for example, protein structure prediction, artificial intelligence, machine learning, modelling of biological molecules/pathways, or ligand docking.

5. Embedding: institute (and base unit)

The position will be embedded in the Groningen Biomolecular Sciences and Biotechnology Institute (GBB) of the Faculty of Science and Engineering (FSE), University of Groningen. The institute GBB has thirteen vibrant research groups, targeting biological questions in the two focal areas 'Molecular Mechanisms of Biological Processes' and 'Physiology and Systems Biology'.

Depending on the research profile of the candidate, the new position will be embedded in one of the computation heavy GBB groups, such as the Molecular Dynamics group (headed by Prof. Marrink), the Biotransformation and Biocatalysis group (headed by Prof. Fraaije), the Molecular Systems Biology group (headed by Prof. Heinemann) or a structural biology group (e.g. Prof. Guskov).

Given the computational nature of the position, the requirements will be primarily in use of computing clusters. There is a large number of experimental GBB groups that offer possibilities for collaborations, for instance to develop novel computational tools and to provide experimental verification of the computational data and vice versa.

6. Local and (inter)national position

Computational teaching is a very important component of education in STEM, taught at the Faculty of Science and Engineering. Although the initial task will be focused on the teaching in the Life Sciences and Technology, Chemistry, and Biology curricula, various similar practical courses are taught in other FSE disciplines, such as Pharmacy and Physics. Regular exchange of experiences and best practices with teachers from these disciplines is expected.

Furthermore, the successful candidate will be expected to be in close contact with the PIE (Professionalization and Innovation in Education) team at FSE that not only collects good practices, but also provides training for teaching assistants that will aid in practical courses. Other links can be envisaged with the computational teaching in Biomedical Sciences, which is carried out at the University Medical Centre (UMCG).

In a (inter)national setting, various professional bodies focused on scientific disciplines have an education division aimed at improvement and development of education of the discipline. In terms of international position, the University of Groningen takes pride in having programmes with a larger than average practical

course load, resulting in a very high quality of students that graduate from our programmes.

7. Expected contributions to teaching
The teaching profile of the new position will be focused on modernization and harmonization of computational courses in the BSc programmes Life Science and Technology, Chemistry and Biology (and possible MSc. programmes). The hired tenure-track Assistant Professor with an educational profile (TTe) will become coordinator of several computational courses, of various size in terms of student enrolment, and throughout the entire curricula, and set up a collegial consultation with other staff members that use computational tools in their courses. The   TTe will develop best practices, and transfer this knowledge to others (Teaching of Teachers). The   TTe new staff member will critically evaluate the content of the courses, to make sure that students are taught state-of-the-art computational skills, but also that the development of skills throughout the different curricula is continuous and logical, and that integration between practice and theory is maintained. The ideal candidate would already have relevant experience with teaching.
The   staff member also will play an active role in the development or critical evaluation of courses, to ensure a demonstrably high didactic quality of the offered courses. (S)He is expected to apply for educational grants (e.g. Comenius) to fund innovative education developments, and will also play an active role in the organization of education at a programme or faculty level, for example by serving on programme committees.
Over the course of the appointment, the requirements for both the Basic and Senior University Teaching Qualifications will have to be fulfilled.

8. Expected contributions to research
The research tasks entail (i) fundamental computational scientific studies that result in peer-reviewed publications in internationally renowned scientific journals, and (ii) the co-supervision of at least one PhD student and/or postdoctoral fellows in their research. These tasks will be carried out in a research group of GBB that fits with the research profile of the candidate.
The research activities should further result in the strengthening of the international position of the institute GBB and FSE's computational biology sciences in general. External funds raising is not essential to this position, but is a possibility.

9. Expected contributions to the organization
The candidate is expected to have an active interest and to provide a positive contribution to the management and organizational tasks of the institute. At the level of FSE, the candidate will contribute to the organization of the faculty, for example by participating in working groups and committees in the area of education. The candidate will participate in relevant national and international organizations.