PhD position in Single-Molecule Biophysics

We are looking for a highly motivated PhD student to join our team for a new project funded by an NWO VIDI grant on the physics of ice-binding proteins.

Project description
Growth of ice crystals can induce critical damage to living systems. Many lifeforms produce ice-binding proteins to protect themselves against frost damage at temperatures as low as -70°C. The physical basis of cryoprotection by ice-binding proteins is not well understood. This project aims to unravel the physical principles that enable ice-binding proteins to modulate the water-ice phase transition. To this end, innovative single-molecule methodology will be developed to directly resolve dynamic interactions between ice, water, and proteins on the nanometer length scale. New insights into the physics of ice-binding proteins can help to harness and optimize their cryoprotective potential in e.g. healthcare, crop protection, food technology, and anti-icing approaches.

Resolving molecular interactions at the ice-water interface is a major challenge that we aim to overcome by exploring and exploiting new single-molecule biophysical methodology.

• The PhD candidate will develop an innovative single-molecule analysis platform based on optical tweezers, super-resolution fluorescence microscopy, microfluidics, and novel refrigeration methods;
• The single-molecule platform will be used to quantify dynamic molecular interactions of model systems such as DNA and of ice-binding proteins. This involves data acquisition as well as analysis and modeling of results;
• The project involves collaboration with local, national, and international scientist in fields of physics, biology, and chemistry;
• The candidate is expected to publish his/her results in international peer-reviewed journals and present the work on national and international conferences.

Qualifications and skills
The suitable candidate is ambitious and highly motivated to perform research at the highest international level, collaborate in a multidisciplinary environment, and holds an MSc degree in (bio)physics or similar, with:

• Demonstrable affinity and/or skills in (optical) instrument/methods development and trouble-shooting;
• Preferred experience with development of data-acquisition/control hardware/software;
• Experience with single-molecule force and/or fluorescence microscopy methods or other optical methodology is preferred but not essential;
• Excellent communication skills in written and spoken English.

Application
Applicants are requested to write a letter in which they describe their abilities and motivation, accompanied by a curriculum vitae and one or two references (name(s) and e-mail address(es)). Please send your application by e-mail before October 31st 2017 to i.heller@vu.nl and mention the vacancy number 17255 in the e-mail header.

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Our university
Vrije Universiteit Amsterdam (VU) is a leading, innovative and growing university that is at the heart of society and actively contributes to new developments in teaching and research. Our university has ten faculties, and provides work for over 4,500 staff and scientific education for more than 23,000 students.

Department
The Faculty of Science of VU University Amsterdam encourages scientists and students to find sustainable solutions to the complex issues of this day and age. With over 5,700 students and 2000 staff, it is the largest faculty of the VU. With great dedication, we practice science addressing every manner of subject centered around four domains: Information Sciences, Human Life Sciences, Science for Sustainability, and Fundamentals of Science. The collaboration between scientists working on fundamental and applied research allows communities to be built beyond the borders of the various disciplines, following new and innovative pathways. Our Amsterdam Zuidas location also offers unique opportunities for international exchange and collaboration.

The position will be in the Physics of Living Systems section of the Department of Physics and Astronomy. This vibrant section consists of the groups of 5 principle investigators and is internationally renowned for the experimental and theoretical biophysics research in a variety of topics ranging from molecular to systems scales. The section is part of the Institute of Lasers, Life and Biophotonics (LaserLaB) Amsterdam and is equipped with unique world-class facilities for nanoscale imaging and manipulation. In particular, there is a long-standing expertise in development of innovative optical methodology dedicated to answering fundamental biophysical questions. The section is involved in many (inter)national collaborations and has a strong international atmosphere.

Conditions of employment
The appointment will be initially for 1 year. After satisfactory evaluation of the initial appointment, it can be extended for a total duration of 4 years. You can find information about our excellent fringe benefits of employment at www.workingatvu.nl like:
• remuneration of 8,3% end-of-year bonus and 8% holiday allowance
• solid pension scheme (ABP);
• a minimum of 29 holidays in case of full-time employment;
• generous contribution (65%) commuting allowance based on public transport;
• discounts on collective insurances (healthcare- and car insurance);
• a wide range of sports facilities which staff may use at a modest charge.

Salary
The salary will be in accordance with university regulations for academic personnel, and amounts € 2222,- gross per month in the first year up to € 2840,- in the fourth year (salary scale) based on a full-time employment.

Additional information
For additional information please contact dr. ir. Iddo Heller (i.heller@vu.nl).