In the Biophysics and Complex Fluids Group, Department of Physics, National University of Singapore, https://phyweb.physics.nus.edu.sg/~bcf/, there are openings for

2 Postdoctoral Research Fellows

The research of the group focuses on the theoretical/computational modelling and experimental investigation of biological complex fluids and to apply this knowledge to the design of nanodevices of biotechnological importance. New research is directed towards nanofluidic devices for DNA-protein interaction studies, large-scale sequencing of genetic information, and epigenetic profiling. Inspired by the motto "it takes two to tango", the present project aims at the investigation of the concerted motion of DNA and proteins with an integrated approach of nanoscience, DNA and protein physics and chemistry, and optical imaging. We expect that the previously largely overlooked concerted motion of DNA and protein has important implications for understanding molecular events in DNA replication, repair, and expression of genes.

The project will be done by two postdoctoral research fellows with the following, complementary tasks:

1) *Biochip nanofabrication and soft lithography*
   In collaboration with the Centre of Ion Beam Research, Department of Physics, National University of Singapore, micro- and nanofluidic biochips will be fabricated in elastomer with soft lithography. Different resist materials and biochip architectures need to be optimized for the development of a high throughput nanofluidic imaging platform. The experimental methodology includes proton and electron beam writing, UV lithography, scanning electron, atomic force, and optical microscopies.

2) *Nanofluidic tracking of DNAs and proteins*
   Proteins and DNA substrates will be prepared and/or isolated, purified, and site- and sequence-specific labelled with quantum dots and/or fluorescence dyes. They will be imaged with the high throughput nanofluidic platform in the Biophysics and Complex Fluids Laboratory. Tracking of different proteins on DNAs with specified target sequences, together with the measurement of DNA's internal fluctuation, will eventually elucidate the concerted motion.

Expertise in nanolithography, soft condensed matter physics, biomolecular chemistry, and/or biophysics including fluorescence imaging is an advantage. The studentship involves a scholarship for a Doctor of Philosophy by research in the Department of Physics, National University of Singapore (intake August 2022). The successful candidates for the postdoctoral research fellow positions will be offered a contract for one year with the possibility for extension with another two years. Remuneration will be according to standard NUS rates. The projected starting date of the research fellow positions is March 2022.

Candidates interested in the postdoctoral research fellow positions can send their application including a cover letter, curriculum vitae, and list of publications to Johan R. C. van der Maarel (phyjrcvd@nus.edu.sg) or Jeroen A. van Kan (phyjavk@nus.edu.sg).

For information regarding graduate studies by research leading to the degree of Doctor of Philosophy, https://www.physics.nus.edu.sg/student/prospective-doctor-of-philosophy-research/ may be consulted. Candidates for the PhD studentship should explicitly refer to this project in their application for admission to the graduate school.