

One PhD-position in Theoretical/Computational Chemistry/Physics

Within the project “Elucidating the Ultrafast Excitation Energy Transport Network of Photosynthetic Machineries”, one PhD position is available at the University of Groningen (the Netherlands) in close collaboration with Nanyang Technological University (Singapore). The aim of the project is to develop fundamental insight in the energy transport processes fundamental to photosynthesis, which is currently a topic of great interest in the Physical Chemistry community. The PhD student will be enrolled in the Groningen Graduate School of Science and spend three years in Groningen and one year in Singapore during the project. The PhD will receive a dual degree from University of Groningen and Nanyang Technological University.

Requirements

- You are highly motivated and an enthusiastic researcher
- You have a MSc degree in Physical Chemistry, Physics, Chemistry or equivalent
- You have a keen interest in fundamental research on the boarder between physics and chemistry
- You have excellent analytical skills and a keen interest in the interpretation of complex data
- You have strong theoretical skills and interest in programming
- Good social skills and ability to collaborate with experimentalists
- You are fluent in English

Position: “ Modelling the Ultrafast Excitation Energy Transport Network of Photosynthetic Machineries”

The main goals of this project are to provide the theory required to understand the energy transport in the photosystem II super complex (PSII-SC) natural light harvesting systems, model and interpret ultrafast multidimensional spectroscopic experiments on these systems. Important parameters to study include the energy levels of chlorophyll molecules and their fluctuations within individual protein complexes (as LHClI) and the couplings between energy levels within each protein complex and between different complexes. These parameters will be determined combining information about the protein structures, molecular dynamics, *ab initio* calculations, and knowledge from spectroscopic studies.

Excitation energies and intermolecular couplings parametrized from *ab initio* calculations on the antenna molecules using monomers and dimers will be used to construct Frenkel exciton Hamiltonians. These will be used to calculate the absorption spectra and ultrafast multidimensional spectra of isolated antenna systems and connected antenna systems. Furthermore, in collaboration with the experimental group in Singapore this will be used to unravel the excitation energy transport network in the photosynthetic machinery. This will allow determining the design principles of the PSII-SC system and other photosynthetic machineries.

The PhD student will gain experience in the use of *ab initio*, DFT, and semi-empirical methods, exciton theory, programming, spectral modelling, and soft academic skills. The position will be embedded within the Theory of Condensed Matter group (Thomas L.C. Jansen and Jasper Knoester <https://www.rug.nl/research/zernike/theory-of-condensed-matter/>) in Groningen and during the stay in Singapore in the Ultrafast Multidimensional Spectroscopy group in Singapore (Howe-Siang Tan <https://www3.ntu.edu.sg/home/howesiang/new/index.htm>).

Our offer

- Successful candidates will first be offered a temporary position of 1 year with the option of renewal for another 3 years, with a qualifier in the 1st year
- Salary ranging from € 2.266,- gross at the start to € 2.897,- gross in the 4th year (salary and conditions are in accordance with the collective labor agreement for Dutch universities)
- Excellent benefits including a holiday allowance of 8% of the gross annual salary and a year-end bonus of 8.3% and a solid pension scheme
- Stimulating scientific environment with enthusiastic colleagues
- A training program in which you and your supervisors will make up a plan for additional suitable education and supervision
- A high degree of responsibility and independence, but also stimulate interaction and discussion with colleagues
- Exciting teaching opportunities (up to ca. 10% of the time)

Information and application

Please send your application including an application/motivation letter, emphasizing your specific interest and motivation to apply for this position, a detailed CV, contact details of at least 2 referees, and an academic transcript of B.Sc. and M.Sc. education. A TOEFL, IELTS score or other documentation to verify sufficient mastering of the English language. An onsite interview will be part of the selection procedure.

Send the application package to:

Thomas la Cour Jansen (t.l.c.jansen@rug.nl)

Review of applications will start 13th of February.