

Open PhD-position in Theoretical Physics/Chemistry and Computational Spectroscopy

Within the NWO Chemical Sciences TOP project “*The molecular mechanism of long-range exciton transfer in chiral self-assembled supramolecular matrices*”, a new PhD position (1.0 fte) is available. This research is part of a new collaboration between the University of Groningen, Leiden University and the University of Twente. The aim of this project is to develop fundamental insight into *the role of vibronic coupling in long-range exciton transfer in chlorosomes*, which is currently a topic of great interest in the Physical Chemistry community.

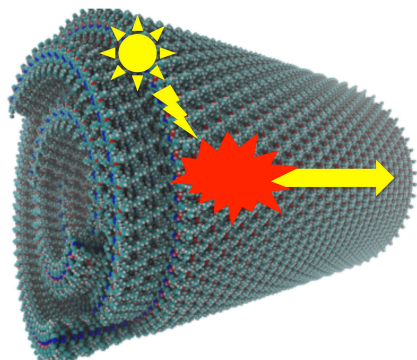


Figure: Chlorosomes are natural light harvesting antenna in bacteria. They are made up of closely stacked bacteriochlorophyll molecules. They absorb light from the sun and transport the energy in the form of tightly bound electron-hole pairs towards the reaction center, where the energy is converted to chemical energy. The light harvesting efficiency and transport speed is so efficient that the green sulfur bacteria having these chlorosomes can survive in extremely dark places as 100 meter below the surface of the sea. The mechanism of the efficient transport is still debated and will be the focus of this research.

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 Physical Chemistry research
- You have excellent analytical skills and a keen interest in the interpretation of complex data
- You have strong theoretical skills as well as programming experience
- You are fluent in English

PhD position (University of Groningen)

Modelling the role of structure and vibrational modes in long-range exciton transfer

This position will provide the modeling to bridge between the NMR results and the optical spectroscopy. The PhD student will develop a genuine multi-scale approach combining classical all-atom Molecular Dynamics (AA-MD) to predict structural dynamics, Time-Dependent Density Functional Theory (TD-DFT) to obtain parameters for an effective Frenkel exciton model, which in turn will be used to model the exciton energy transport and spectroscopy. This approach is the only way to model the exciton transport through 1000's of BChl molecules with sufficient time duration and resolution and allow for the simulation of, and validation to, long-range transfer and optical spectra. This will reveal underlying mechanisms of high quantum efficiency and the role of vibrational modes in transport processes and allow us to devise new design principles for artificial light harvesting systems. The position will be embedded within the Theory of Condensed Matter group (<https://www.rug.nl/research/zernike/theory-of-condensed-matter/>) and the project will be supervised by Dr. Thomas la Cour Jansen. Strong interactions with the Leiden group including frequent visits should be expected. The PhD student is expected to contribute to teaching (up to ca. 10 % of the time) and will be enrolled in the Groningen Graduate School of Science and Engineering.

University of Groningen

Founded in 1614, the University of Groningen enjoys an international reputation as a dynamic and innovative centre of higher education offering high-quality teaching and research. Flexible study programmes and academic career opportunities in a wide variety of disciplines encourage the 30,000 students and researchers alike to develop their own individual talents. As one of the best research universities in Europe, the University of Groningen has joined forces with other top universities and networks worldwide to become a truly global center of knowledge.

The position will be embedded within the Theory of Condensed Matter group (<https://www.rug.nl/research/zernike/theory-of-condensed-matter/>), which is part of the Zernike Institute for Advanced materials and focus on modeling and understanding fundamental electronic, magnetic, and optical properties of condensed-phase systems. The Zernike Institute for Advanced materials is one of 10 research institutes of the Faculty of Science and Engineering (FSE). FSE offers education and research in a wide range of science disciplines: from traditional disciplines such as physics, mathematics and biology to interdisciplinary

fields such as artificial intelligence, materials science and industrial engineering and management. The faculty's staff and students come from all over the world and nearly all its degree programmes are English-taught.

For more information, see www.rug.nl and <https://www.rug.nl/education/phd-programmes/>

Our offer

- The successful candidate 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
- We offer a stimulating scientific environment with enthusiastic colleagues
- Salary and conditions are in accordance with the collective labor agreement for Dutch universities
- Salary ranging from € 2.266,- gross at the start to € 2.897,- gross in the 4th year
- 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
- A training program in which you and your supervisors will make up a plan for additional suitable education and supervision
- We encourage a high degree of responsibility and independence, but also stimulate interaction and discussion with colleagues

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, an academic transcript of B.Sc. and M.Sc. education and a TOEFL or IELTS score to verify sufficient mastering of the English language. An interview will be part of the selection procedure. **Application deadline: May 24th 2019.**

Enquiries and applications for the PhD position: Dr. Thomas la Cour Jansen, e-mail: t.l.c.jansen@rug.nl