

The Leiden Institute of Physics has opened a:

PhD position: *Optical Near-field Electron Microscopy*

Leiden Institute of Physics, Faculty of Sciences Leiden, Leiden University,
in collaboration with partners in Vienna and Prague

Research program

This PhD project is part of the European FET-Proactive program [ONEM](#). ONEM (Optical Near-field Electron Microscopy) is an exciting new microscopy technique that we are developing with colleagues in Vienna and Prague. The goal of ONEM is to create a fusion between optical imaging and electron microscopy. The envisioned technique is damage-free, requires no labels, and allows for spatial resolution in the nanometer range. In a nut shell, we combine visible-light illumination of the sample with low-work-function photo-electron emission in the optical near field. The photo-electrons are used to form a nanometer resolution image. For an extensive explanation see: [Phys. Rev. Applied 16, 014008 \(2021\)](#). Although a high-risk, high-gain project, we have already demonstrated blue-light ONEM with spatial resolution well beyond light-optical resolution. It works! Further improvements in terms of resolution, wavelength range, contrast, temporal resolution and versatility are now being pursued.

Your project

In this PhD trajectory, you will be part of the team in Leiden where the experimental ONEM setup is located. Your task is to further perfect ONEM, by optimizing (polarized) illumination, photocathode performance, and sample handling. Special care will be given to the introduction of a liquid cell within which we can follow 'live' dynamics. Thus you will be able to perform a series of unique experiments, aiming specifically for dynamics in biological systems, and nano-sized material growth via electrodeposition. In your PhD time, we expect you to reap what has been sowed in the first stages of our program.

Your skills

We are looking for a motivated and skilled experimental physicist or applied physicist (MSc; f/m) who combines scientific curiosity with enthusiasm for hands-on experiment. A background in condensed matter physics, biophysics, electrochemistry and/or electron microscopy is helpful. The position offers the opportunity to work in a team setting, both locally and internationally.

What we offer

We take pride in a collaborative, enthusiastic and scientifically strong environment in a renowned research institute, the Leiden institute of Physics, where the input of each person is valued equally. You will be part of the international ONEM team, with connections to Austria, the Czech Republic, Germany, and the USA. The work is expected to lead to high-impact publications and international visibility. Note that in the Netherlands, a PhD candidate is considered an employee with all the benefits that come with that. Finally, Leiden is a beautiful town close to the beach, with a great academic tradition and atmosphere.

Leiden University

The Leiden Institute of Physics (LION) is one of the oldest physics institutes in the Netherlands with more than 180 staff and around 30 senior scientists. LION is part of the

Faculty of Science and covers a very broad spectrum of physics research and education. Theory and experiments go hand in hand at LION: from cosmology to mechanics of DNA, from granular matter to quantum nanoscience.

The Faculty of Science is an excellent faculty where staff and students work together in a dynamic international environment. Personal and academic development are our top priority. Our faculty members are committed to expanding their fundamental knowledge by looking beyond the boundaries of their own discipline; the aim is to benefit science, and to contribute to the major societal challenges of the future.

The research carried out at the Faculty of Science is diverse, ranging from Mathematics, Information science, Astronomy, Physics, Chemistry, Bio-pharmaceutical sciences, Biology and Environmental sciences. Eight institutes organize research activities. These institutes offer eight bachelor's and twelve master's programs. Our faculty has grown immensely in recent years. We are located at the heart of Leiden's Bio Science Park, one of Europe's largest science parks, where university and business life come together.

Information and application

The vacancy is open as of May 6, 2024. Feel free to apply directly or to ask for more information. If you apply, please include a CV and a relevant motivation letter with the names of two references.

Applications are to be sent to Ms. M. van Steijn (steijn@physics.leidenuniv.nl)

For more information, please contact Prof. Dr. Sense Jan van der Molen (molen@physics.leidenuniv.nl)