

PhD vacancy on Optical Near-field Electron Microscopy, Leiden University

The overarching program

This PhD project is part of the European FET-Proactive program 'ONEM'. The latter stands for optical near-field electron microscopy, which is an exciting new microscopy technique we are developing with groups in Vienna and Prague. The basic goal of ONEM is to find the optimum between optical imaging and electron microscopy. The envisioned technique is damage-free, it requires no labels, and allows for a resolution on nanometer scales. In a nut shell, we combine visible-light illumination of the sample with low-work-function photoemission in the near field and, finally, electron imaging. For an extensive explanation see: [Phys. Rev. Applied 16, 014008 \(2021\) - Optical Near-Field Electron Microscopy \(aps.org\)](#)

Although a typical high-risk, high-gain project at first, by now we can say that (blue light) ONEM has been successfully demonstrated. It works!

But it can still be much better in terms of resolution, wavelength range, contrast and versatility.

Your project

In this PhD trajectory, you will be part of the team in Leiden, which is where the setup is located. Your task is to perfection 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, where we aim specifically for dynamics of biological systems and nano-sized growth via electrodeposition. Basically, in your PhD time, we expect to reap what has been sowed in the first stages of our program, in close collaboration with Vienna and Prague.

Your skills

We are looking for a motivated and skilled experimental physicist or applied physicist (MSc) that combines scientific curiosity with a hands-on mentality. A background in condensed matter physics, biophysics and/or electron microscopy is recommended, but do feel free to apply if you have a different background. The position requires you to work in a team, both locally, and internationally.

What we offer

We offer a collaborative, enthusiastic and scientifically strong environment in a renowned research institute, the Leiden institute of Physics. Furthermore, you will be part of the international ONEM team, that also connects to the U.S. and Germany. 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.

More information

The vacancy is open as of August 17, 2023. 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.

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