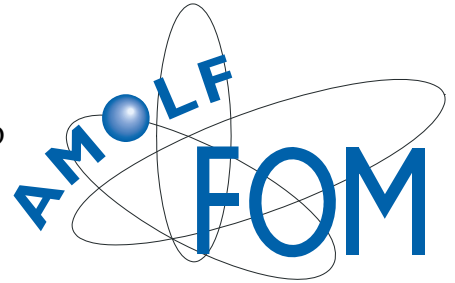


Resonant nanophotonics

2 PhD vacancies at AMOLF

AMOLF

The FOM Institute for Atomic and Molecular Physics (AMOLF) is one of the national research institutes of the Stichting FOM (the Foundation for Fundamental Research on Matter). The institute employs around 200 people, half of whom are research staff (faculty staff, postdocs, and PhD students). AMOLF provides a dynamic environment, where advanced research is performed in research groups comprising around 8 scientists on average. See also <http://www.amolf.nl>.



Project 1: Nanoscale control of single emitters

In the group Resonant Nanophotonics we are looking for a Ph.D. student to realize a scanning probe microscopy experiment in which a nanoscopic light source is controllably coupled to a localized resonant scattering structure, such as a plasmon antenna. Controlling the emission of single photons by emitters such as quantum dots or dye molecules is of key interest to quantum optics, and optical quantum cryptography. The goal of this research is to manipulate the rate of emission, as well as the directions into which photons are emitted by attaching the emitter to a very fine tip, and controllably positioning it relative to coupled plasmonic or metamaterial antenna structures.

Project 2: Optics of metamaterial resonances

Metamaterials are based on arrays of resonant magnetic nano-scatterers that provide a magnetic response at optical frequencies, a phenomenon held to be impossible until recently. Fuelled by the promise of perfect lenses and 'invisibility' cloaks, such scatterers were recently realized even for visible light frequencies. The group Resonant Nanophotonics is looking for an experimental Ph.D. student to develop the potential of such magnetic nanoscatterers for optics outside the context of negative n media. The goal of this research is to understand individual magnetic nanoscatterers, to explore the coupled interaction of such scatterers in clusters, and ultimately to understand the interaction of metamaterial resonances with quantum sources of light. The successful candidate will fabricate structures with state-of-the-art nanofabrication techniques in the Amsterdam Nanocenter at AMOLF, and will study them with spectroscopic optical scattering techniques as well as with quantitative optical microscopy.

Terms

The positions are intended as full-time (38 hrs / week, 12 months / year) appointment in the service of Foundation for Fundamental Research on Matter (FOM) for the duration of four years. After successful completion of the PhD research a PhD degree will be granted at a Dutch university. AMOLF assists any new foreign employees with housing and visa applications and compensates their transport costs and furnishing expenses.

Contact

Femius Koenderink

Resonant Nanophotonics
FOM Institute AMOLF
Kruislaan 407
1098 SJ Amsterdam
E-mail: f.koenderink@amolf.nl
Tel.: 020-608 1234
URL: <http://www.amolf.nl>