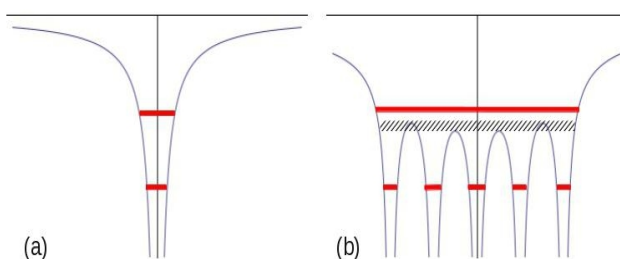
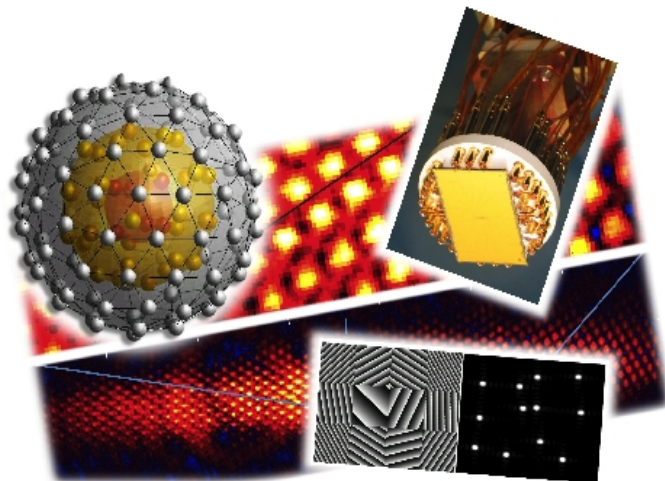


The research group *Coherence and Quantum Technology*, Department of Applied Physics, Eindhoven University of Technology, announces a

Theoretical PhD position: Rydberg atoms in Lattices and crystals for quantum simulation

Project: The challenge is to explore novel regimes in quantum simulation using Rydberg atoms. In this project, we work closely together with experimental projects in Eindhoven and Amsterdam, where our research will play a guiding role for future experimental directions. The ultimate goal of the research is to develop a platform based on Rydberg atoms for the simulation of classical and quantum Hamiltonians. Ordered structures of Rydberg atoms – Rydberg crystals, form an excellent starting point to enter the strongly-coupled regime. In this regime the potential energy dominates over the kinetic energy, and exotic solid-like phases such as Wigner crystals have been predicted. We will study the crossover from a Rydberg crystal to a strongly-coupled plasma, and investigate what type of phase-transitions can be expected in such an experiment.



Setting: You will team up with a second, experimental PhD student and a post-doctoral researcher plus MSc students. Faculty members dr. Servaas Kokkelmans, dr. Edgar Vredenburg, and prof.dr. Jom Luiten together supervise the project.

The *Rydberg Lattices* project is part of a collaborative research program [From Rydberg atom to quantum bit](#) with the Quantum Gases and Quantum Information group at the University of Amsterdam, and sponsored by FOM, the prime funding agency for fundamental research in the Netherlands. For further information about the position please contact Servaas Kokkelmans (s.kokkelmans@tue.nl) or Edgar Vredenburg (e.j.d.vredenburg@tue.nl).

Employment: The PhD position is for four years, during which you will be employed by the FOM Foundation and participate in all the benefits that FOM offers. For details visit <http://www.fom.nl>.

How to apply: Send your application by e-mail to secretariaat.cqt@tue.nl and include a letter explaining your motivation and research interests, a curriculum vitae, and names and e-mail addresses of two references. We require an MSc degree in physics, preferably experience in atomic and optical physics, and fluency in English.

Further reading:

- [1] A recent PhD thesis, see R.M.W. van Bijnen, *Quantum Engineering with Ultracold Atoms*, (2013), available at <http://alexandria.tue.nl/extra2/754785.pdf>