PhD student position:

# Nanoscale magnetic trap arrays: quantum simulators on an atom chip

In the group Quantum Gases and Quantum Information at the University of Amsterdam we are looking for a talented PhD student.

We have previously realized a two-dimensional array of microtraps for ultracold atoms on a magnetic-film atom chip [1]. This novel system holds great promise as a future quantum information science platform based on neutral atoms. In this line of research a new project is starting to scale down microtrap arrays to sub-optical dimensions, to ~100 nm lattice parameter. This would lead to a quantum simulator using neutral atoms on a lattice, however opening up parameter regimes that are as yet inaccessible for optical lattices. The almost unlimited design flexibility allows for a great variety of structures including nonperiodic structures or even designer defects.

The PhD student will join a small team that will fabricate these new lattices on a chip, and will study the behavior of ultracold atoms loaded into this trap lattice. Nanofabrication facilities for the atom chips are available both locally and on the national level. This project builds on the existing atom-chip expertise [1,2] in the groups of dr. R. Spreeuw and dr. N.J. van Druten and will take place in close contact with the existing experiments on cold quantum gases.

We are looking for a PhD student with strong experimental skills and a solid theoretical background, who works well in a team.

Applicants should send:

- a letter stating their research interest and motivation
- their curriculum vitae
- names and email contacts of possible references

by email to r.j.c.spreeuw@uva.nl

You will be employed as a junior scientist by the FOM foundation. The contract is for 4 years, at the end of which you are expected to have completed a thesis. Your salary will be up to a maximum of 2,610 euro gross per month. You will also be entitled to all the employee benefits that FOM offers. For further details or questions please contact the group leader, dr. R.J.C. Spreeuw.

[1] S. Whitlock, *et al*., New J. Phys. **11**, 023021 (2009)
[2] A. H. van Amerongen, *et al*., Phys. Rev. Lett. **100**, 090402 (2008)