

# Curriculum vitae

Updated: September 2016

## Personal information

Full name: Alexander F. (Sander) Otte  
Date of birth: November 24, 1979  
Marital status: Married, two children  
Website: <http://ottelab.tudelft.nl>

## Education

2003 – 2008 PhD Experimental Physics, Leiden University, The Netherlands  
*Promotor: Prof. dr. J. M. van Ruitenbeek*  
1998 – 2003 MSc Physics, Leiden University, The Netherlands  
1992 – 1998 Gymnasium, Marnix College Ede, The Netherlands

## Employment

2015 – present Associate Professor  
Kavli Institute of Nanoscience, Delft University of Technology, The Netherlands  
2010 – 2015 Assistant Professor (tenure track)  
Kavli Institute of Nanoscience, Delft University of Technology, The Netherlands  
2008 – 2010 Postdoctoral Research Associate  
Center for Nanoscale Science and Technology, NIST Gaithersburg, USA  
*Supervisor: Dr. J. A. Stroscio*  
2006 – 2007 Visiting PhD Researcher  
IBM Almaden Research Center, San Jose, USA  
*Supervisor: Dr. A. J. Heinrich*  
2003 – 2008 PhD Candidate  
Leiden University, The Netherlands  
*Promotor: Prof. dr. J. M. van Ruitenbeek*

## Teaching experience

2015 – present Classical Mechanics, ~150 students/year  
Delft University of Technology, 2nd year BSc Applied Physics program  
2011 – present Solid State Physics, ~120 students/year  
Delft University of Technology, 3rd year BSc Applied Physics program  
2011 – present Lab course 'Quantum Conductance', ~30 students/year  
Delft University of Technology, 2nd year BSc Applied Physics program  
2011 – 2014 Lab course 'Nanoelectromechanical Systems', ~30 students/year  
Delft University of Technology, 2nd year BSc Applied Physics program  
2004 – 2006 Quantum Mechanics, ~40 students/year (teaching assistant)  
Leiden University, 2nd year BSc Physics program

## Supervision experience

- 2010 - present Delft Univ. of Technology: 3 Postdocs, 4 PhD students, 6 MSc students, 7 BSc students  
 2004 - 2006 Leiden University: 2 BSc students

## Research Funding Acquired

2016	<i>SPINCAD: Spin correlations by atomic design</i> ERC Starting Grant	€ 1.5M
2015	<i>Sub-atomic spin resolution through magnetically functionalized scanning probe tips</i> FOM Projectruimte	€ 400k
2013	<i>A combined cryogenic STM/AFM system for local spectroscopy on nanofabricated devices</i> NanoFront internal equipment call	€ 1M
2013	<i>Imaging Majoranas</i> NanoFront internal PhD call	€ 200k
2012	<i>Atomically assembled quantum spin liquids</i> NWO Vidi grant	€ 800k
2011	<i>Time-resolved spin manipulation in a single atom</i> FOM Projectruimte	€ 500k
2010	Tenure track startup grant, Delft University of Technology	€ 700k

## Organizational activities

- 2015 Co-organizer SPICE workshop *Magnetic adatoms as building blocks for quantum magnetism*  
 2013 - 2016 Dutch Vacuum Society (NEVAC) – President  
 2011 - 2013 Dutch Vacuum Society (NEVAC) – Vice-president  
 2011 - 2014 Faculty Chairman, Dept. of Quantum Nanoscience  
 2010 - 2013 Coordinator Casimir Pre-PhD Track, Casimir Research School

## Committee work

- 2015 NWO Veni panel 2015, Innovational Research Incentives Scheme  
 2014 - 2015 Program committee Physics@FOM Veldhoven 2015  
 2015 - present Program committee Nanometer Structure Division, International Vacuum Congress IVC-20, 2016  
 2014 - present Steering committee International Conference on Nanoscience and Technology (ICN+T)

## Awards

- 2016 Teacher of the Year, Faculty of Applied Sciences, TU Delft  
 2014 Nominated for Teacher of the Year, Faculty of Applied Sciences, TU Delft  
 2012 Nominated for Teacher of the Year, Faculty of Applied Sciences, TU Delft  
 2009 SPMage09 scanning probe microscopy image contest, second prize (€ 2,500)

## Outreach activities

- 2016 Radio interview for BBC World Service, NPR Marketplace Tech, Science Friday (Public Radio International) and Dutch radio stations Radio 1 and BNR
- 2012 Live public demonstration of atom manipulation on Dutch 'Day of Nanotechnology'
- 2007 Interview *Atoomgeheugen* ('Atomic memory') on Dutch national radio show *VPRO Noorderlicht*

## Referee Service

Frequent referee for *Science*, *Nature Communications*, *Physical Review Letters*, *ACS Nano*, *Scientific Reports*, *Surface Science*, *Physical Review B* and *Journal of Physical Chemistry Letters*

## Publications – Research articles

*A kilobyte rewritable atomic memory*

- F. E. Kalff, M. P. Rebergen, E. Fahrenfort, J. Girovsky, R. Toskovic, J. L. Lado, J. Fernández-Rossier and A. F. Otte  
[Nature Nanotechnology AOP \(2016\)](#) – [Featured in News & Views by S. Erwin](#)

*Atomic spin-chain realization of a model for quantum criticality*

- R. Toskovic, R. van den Berg, A. Spinelli, I. S. Eliens, B. van den Toorn, B. Bryant, J.-S. Caux and A. F. Otte  
[Nature Physics 12, 656 \(2016\)](#) – [Featured in News & Views by F. Mila](#) **2 citations**

*Exploring the phase diagram of the two-impurity Kondo problem*

- A. Spinelli, M. Gerrits, R. Toskovic, B. Bryant, M. Ternes and A. F. Otte  
[Nature Communications 6, 10046 \(2015\)](#) **2 citations**

*Controlled complete suppression of single-atom inelastic spin and orbital cotunneling*

- B. Bryant, R. Toskovic, A. Ferrón, J. L. Lado, A. Spinelli, J. Fernández-Rossier and A. F. Otte  
[Nano Letters 15, 6542 \(2015\)](#) **4 citations**

*Invited Topical Review: Atomically crafted spin lattices as model systems for quantum magnetism*

- A. Spinelli, M. Rebergen and A. F. Otte  
[Journal of Physics: Condensed Matter 27, 243203 \(2015\)](#) **2 citation**

*Imaging of spin waves in atomically designed nano magnets* – Cover article

- A. Spinelli, B. Bryant, F. Delgado, J. Fernández-Rossier and A. F. Otte  
[Nature Materials 13, 782 \(2014\)](#) – [Featured in News & Views by S. Rohart and G. Rodary](#) **28 citations**

*Local control of single atom magneto-crystalline anisotropy*

- B. Bryant, A. Spinelli, J. J. T. Wagenaar, M. Gerrits and A. F. Otte  
[Phys. Rev. Lett. 111, 127203 \(2013\)](#) **35 citations**

*Invited review paper: A 10 mK scanning probe microscopy facility*

- Y. J. Song, A. F. Otte, V. Shvarts, Z. Zhao, Y. Kuk, S. R. Blankenship, A. Band, F. M. Hess and J. A. Stroscio  
[Rev. Sci. Instrum. 81, 121101 \(2010\)](#) **43 citations**

*High-resolution tunnelling spectroscopy of a graphene quartet*

- Y. J. Song, A. F. Otte, Y. Kuk, Y. Hu, D. B. Torrance, P. N. First, W. A. de Heer, H. Min, S. Adam, M. D. Stiles, A. H. MacDonald and J. A. Stroscio  
[Nature 467, 185 \(2010\)](#) **64 citations**

*Controlling the state of quantum spins with electric currents*

S. Loth, K. von Bergmann, M. Ternes, A. F. Otte, C. P. Lutz and A. J. Heinrich

[Nature Physics 6, 340 \(2010\)](#)

**144** citations

*Spin excitations of a Kondo-screened atom coupled to a second magnetic atom*

A. F. Otte, M. Ternes, S. Loth, C. P. Lutz, C. F. Hirjibehedin and A. J. Heinrich

[Phys. Rev. Lett. 103, 107203 \(2009\)](#)

**52** citations

*The role of magnetic anisotropy in the Kondo effect*

A. F. Otte, M. Ternes, K. von Bergmann, S. Loth, H. Brune, C. P. Lutz, C. F. Hirjibehedin and A. J. Heinrich

[Nature Physics 4, 847 \(2008\) - Featured in News & Views by A. Schneider](#)

**159** citations

*Large magnetic anisotropy of a single atomic spin embedded in a surface molecular network*

C. F. Hirjibehedin, C.-Y. Lin, A. F. Otte, M. Ternes, C. P. Lutz, B. A. Jones and A. J. Heinrich

[Science 317, 1199 \(2007\)](#)

**296** citations

*Magneto-quantum oscillations of the conductance of a tunnel point contact in the presence of a single defect*

Ye. S. Avotina, Yu. A. Kolesnichenko, A. F. Otte and J. M. van Ruitenbeek

[Phys. Rev. B 75, 125411 \(2007\)](#)

**11** citations

*Vibrationally induced two-level systems in single-molecule junctions*

W. H. A. Thijssen, D. Djukic, A. F. Otte, R. H. Bremmer and J. M. van Ruitenbeek

[Phys. Rev. Lett. 97, 226806 \(2006\)](#)

**62** citations

*Signature of Fermi-surface anisotropy in point contact conductance in the presence of defects*

Ye. S. Avotina, Yu. A. Kolesnichenko, A. F. Otte and J. M. van Ruitenbeek

[Phys. Rev. B 74, 085411 \(2006\)](#)

**14** citations

Method to determine defect positions below a metal surface by STM

Ye. S. Avotina, Yu. A. Kolesnichenko, A. N. Omelyanchouk, A. F. Otte and J. M. van Ruitenbeek

[Phys. Rev. B 71, 115430 \(2005\)](#)

**20** citations

Observation of electronic and atomic shell effects in gold nanowires

A. I. Mares, A. F. Otte, L. G. Soukiassian, R. H. M. Smit and J. M. van Ruitenbeek

[Phys. Rev. B 70, 073401 \(2004\)](#)

**21** citations

## Publications – popular scientific

*Magnetische bewustwording* (Dutch, meaning 'Magnetic awakening')

Nederlands Tijdschrift voor Natuurkunde **80**, 178 (2014)

*Dans der elektronen* (Dutch, meaning 'Dance of the electrons') – Cover article

Nederlands Tijdschrift voor Natuurkunde **75**, 44 (2009)

Can data be stored in a single magnetic atom? – Cover article

Europhysics News **39**/4, 31 (2008)

**Publications – theses**

*Magnetism of a single atom*, [PhD thesis](#), Leiden University (2008)

**Lectures – invited / colloquia**

International Conference on Nanoscience and Technology (ICN+T), Busan, Korea	Aug. 2016
Conference on the Physics and Chemistry of Surfaces and Interfaces PCSI-43, Palm Springs, CA, USA	Jan. 2016
Quantum Magnets workshop, Crete, Greece	Sep. 2015
SPICE workshop <i>Magnetic adatoms as building blocks for quantum magnetism</i> , Mainz, Germany	Aug. 2015
Workshop on Correlated Electronic Structure and Spin Dynamics CESSD, Hamburg, Germany	May 2015
APS March Meeting, San Antonio, TX, USA	Mar. 2015
'Chez Pierre' Seminar, Dept. of Condensed Matter Physics, MIT, Cambridge, MA, USA	Oct. 2014
8th Int'l Conf. on Phys. and Appl. of Spin Phenomena in Solids (PASPS VIII), Washington DC, USA	Jul. 2014
AAAS Annual Meeting, Chicago, IL, USA	Feb. 2014
544. Wilhelm und Else Heraeus-Seminar, Bad Honnef, Germany	Nov. 2013
Casimir Day, Casimir Research School, Leiden, The Netherlands	Jun. 2013
Dutch Vacuum Society (NEVAC) Day, Amsterdam, The Netherlands	Apr. 2013
NNV Symposium FYSICA, Delft, The Netherlands	Apr. 2013
Int'l workshop on spin-orbit and interaction effects in nano-electronics, Aachen, Germany	Feb. 2013
Dutch symposium on condensed matter physics LSGM, Amsterdam, The Netherlands	Jan. 2013
Natuurkunde Colloquium, Zernike Institute for Advanced Materials, Groningen, The Netherlands	Oct. 2012
International workshop on correlated electrons at surfaces and interfaces, Würzburg, Germany	Oct. 2012
Joint European Magnetic Symposia JEMS, Parma, Italy	Sep. 2012
Colloquium, Dept. of Physics, LMU München, Munich, Germany	Nov. 2011
Symposium on transport through molecules, FB Physik, FU Berlin, Berlin, Germany	Oct. 2011
APS March Meeting, Dallas, TX, USA	Mar. 2011
Joan van der Waals Colloquium, Leiden Institute of Physics, Leiden, The Netherlands	Jan. 2011
European Conference on Surface Science ECOSS25, Liverpool, UK (plenary speaker)	Jul. 2008
Joint International Conference NSS5-SPSTM2, Athens, OH, USA	Jul. 2008
Dutch Scanning Probe Microscopy Symposium, Leiden, The Netherlands	Nov. 2007

**Lectures – contributed / seminars**

MESA+ Institute for Nanotechnology, University of Twente, The Netherlands	Sep. 2016
Workshop <i>Spins on Surfaces</i> , San Sebastian, Spain	Sep. 2016
Institute of Physics, Prague, Czech Republic	Dec. 2015
Physikalisches Institut, Universität Würzburg, Würzburg, Germany	Jun. 2015
Dept. of Condensed Matter Physics, Harvard University, Cambridge, MA, USA	Oct. 2014
Dept. of Physics, Boston College, Chestnut Hill, MA, USA	Oct. 2014
International Conference on Nanoscience and Technology (ICN+T), Vail, CO, USA	Jul. 2014
Kavli Nexus Meeting, Puerto Rico, USA	May 2013
MRS Spring Meeting 2013, San Francisco, CA, USA	Apr. 2013
Institut für Experimentelle und Angewandte Physik (IEAP), Universität Kiel, Kiel, Germany	Nov. 2012
Frontiers of Condensed Matter Physics Summer School, Les Houches, France	Sep. 2011
Dept. of Physics, KIT, Karlsruhe, Germany	May 2011
Max-Planck Institute for Solid State Research, Stuttgart, Germany	May 2011
Institute of Experimental and Applied Physics, Universität Regensburg, Regensburg, Germany	May 2011
DPG Spring Meeting, Dresden, Germany	Mar. 2011
Dutch Scanning Probe Microscopy Symposium, Nijmegen, The Netherlands	Feb. 2011
Dept. of Applied Physics, University of Alicante, Alicante, Spain	Feb. 2011

Dept. of Quantum Nanoscience, TU Delft, Delft, The Netherlands	Jan. 2011
Dept. of Advanced Materials Science, University of Tokyo / ISSP, Tokyo, Japan	Sept. 2010
APS March Meeting, Portland, OR, USA	Mar. 2010
Dept. of Physics & Astronomy, University of Nebraska-Lincoln, Lincoln, NE, USA	Feb. 2010
Dept. of Physics, McGill University, Montreal, Canada	Jan. 2010
Dept. of Quantum Nanoscience, TU Delft, Delft, The Netherlands	Jan. 2010
APS March Meeting, Pittsburgh, PA, USA	Mar. 2009
International Conference on Nanoscience and Technology (ICN+T), Keystone, CO, USA	Jul. 2008
Institute of Applied Physics, Universität Hamburg, Hamburg, Germany	May 2008
London Centre for Nanotechnology, UCL, London, UK	Apr. 2008
Leiden Institute of Physics, Leiden University, Leiden, The Netherlands	Feb. 2008
Center for Nanoscale Science and Technology, NIST, Gaithersburg, MD, USA	Sep. 2007
Center for Nanoscale Materials, Argonne National Laboratory, Argonne, IL, USA	Sep. 2007
International Conference on Nanoscience and Technology (ICN+T), Stockholm, Sweden	Jul. 2007
Hitachi San Jose Research Center, Hitachi Global Storage Technologies, San Jose, CA, USA	Apr. 2007