

Otto Lambert Muskens

Center for Nanophotonics
FOM-Institute for Atomic and Molecular Physics AMOLF
Kruislaan 407, 1098 SJ, Amsterdam, the Netherlands
Tel: +31 (0)20 6081234, muskens@amolf.nl

Personal details

Year of birth 1977
Nationality Netherlands
Address Maasstraat 8
3522TH
Utrecht, The Netherlands
Telephone +31 30 2887611
+31 6 30615687
E-mail muskens@amolf.nl

Education

12/1999 – 03/2004 **PhD in Experimental Physics (cum laude), University of Utrecht**, Faculty of Physics and Astronomy, Utrecht, The Netherlands.
Dissertation: *High-Amplitude, Ultrashort Strain Solitons in Solids*
Promotor: prof. dr. J. I. Dijkhuis, March 22, 2004.

09/1994 – 12/1999 **Doctorandus (equiv. MSc) in Experimental Physics, University of Utrecht**, Faculty of Physics and Astronomy, Utrecht, The Netherlands.
Thesis: *Optical properties and radiative emission from gold nanoparticles*
Majors: Condensed Matter Physics, Theoretical Physics.

Academic experience

01/2007 – present **Post-doctoral Research Project, Center for Nanophotonics, FOM-Institute AMOLF**, Amsterdam, The Netherlands.
Topic: *Transport of classical and quantum light in complex media*.
Group leader: prof. dr. A. Lagendijk.

08/2005 – 12/2006 **Post-doctoral Research Project, FOM-Institute AMOLF and Philips Research**, Eindhoven, The Netherlands.
Topics: *Optics of semiconductor nanowires and plasmonic nanoantennas*.
Group leader: dr. J. Gómez Rivas.

05/2004 – 07/2005 **Post-doctoral Research Project, CNRS / Université Bordeaux 1**, Bordeaux, France.
Topic: *Optical properties and ultrafast spectroscopy of single nano-objects*.
Group leader: prof. dr. F. Vallée.

Teaching

- Otto Muskens taught problem classes (120 hours per year) in Quantum Mechanics I, Thermal and Statistical Physics, Solid State Physics, and Coherent Optics (all 2nd year Physics course), for 3 years from 2000-2003 at the University of Utrecht.

Daily guidance of research projects

2001-2004

V. Mohammedkhani, G. Katgert, I Bosveld (Undergraduate experimental physics 12 weeks)
E.W. Hesselink, S. Purushotoman (Master experimental physics 42 weeks)
H.G. Meijer (Master's theoretical physics 24 weeks)

2005-2006

J. Treffers, T. Rumke (Master experimental physics 42 weeks)

2007-2008

R. El Dardiry (Master experimental physics 42 weeks)
P. Scalia (PhD student)
R. El Dardiry (PhD student)

Prizes and grants

- FOM 'Projectruimte' 2007 proposal 'Highly-local determination of vacuum fluctuations in random media using a single scanning emitter' has been awarded (with prof. A. Lagendijk).
- First prize : 'Nederlands Tijdschrift voor Natuurkunde' (journal of the Dutch Physical Society) for best article based on PhD-thesis, March 2005.
- FOM-postdoc fellowship, 2005
- CNRS-postdoc fellowship, 2004
- FOM-PhD fellowship, 2000

Professional skills

- Known languages: Dutch (mother tongue), English (fluent), French, German (good).
- Participant of one-week 'Nyenrode Management Training', facilitated by FOM.
- Referee for Physical Review Letters, Physical Review B, Nano Letters, Optics Letters, Optics Express, Optics Communications.

Patent

O.L. Muskens, J. Gómez Rivas, E.M.H.P. van Dijk, and D.J.W. Klunder, *Particle Plasmon Sensor Based on Resonant Metal Particle Arrays with Single Wavelength Readout*, European Patent 07301304 (2007)

Publications

A. Scientific Journals¹

20. **O. L. Muskens**, J. Gómez Rivas, R. Algra, E.P.A.M. Bakkers, and A. Lagendijk, *Design of light scattering in nanowire materials for photovoltaic applications*, Nano Lett. *in press* (2008)
19. T. Rümke, J. Sánchez-Gil, **O. L. Muskens**, M. T. Borgström, E. P. A. M. Bakkers, J. Gómez Rivas, *Semiconductor nanowires as local sources of surface plasmons*, Opt. Express **16**(7), 5013:5021 (2008)
18. **O. L. Muskens**, G. Bachelier, N. Del Fatti, F. Vallée, A. Brioude, X. Jiang, M. Pileni, *Absorption spectroscopy of a single gold nanorod*, J. Phys. Chem. C **112**, 8917:8921 (2008)
17. **O. L. Muskens**, S. L. Diedenhofen, M. H. M. van Weert, M. T. Borgström, E. P. A. M. Bakkers, J. Gómez Rivas, *Epitaxial growth of semiconductor nanowire metamaterials for photonic applications*, Adv. Func. Mater., **18**(7), 1:8 (2008) [with Cover Artwork]
16. **O. L. Muskens**, A. Lagendijk, *Broadband enhanced backscattering spectroscopy of strongly scattering media*, Opt. Express **16**(2), 1222:31 (2008) [VJBO]
15. **O. L. Muskens**, V. Giannini, J. A. Sánchez Gil, J. Gómez Rivas, *Optical scattering resonances of single and coupled dimer plasmonic nanoantennas*, Opt. Express **15**(26), 17736:46 (2007) [VJBO]
14. **O. L. Muskens**, V. Giannini, J. A. Sánchez Gil, J. Gómez Rivas, *Strong enhancement of the radiative decay rate of emitters by single plasmonic nanoantennas*, Nano Lett. **7**(9), 2871:75 (2007)
13. **O. L. Muskens**, J. Treffers, M. T. Borgström, E. P. A. M. Bakkers, J. Gómez Rivas, *Modification of the photoluminescence anisotropy of semiconductor nanowires by coupling to surface plasmon polaritons*, Opt. Lett. **32**(15), 2097:99 (2007) [VJNano]
12. **O. L. Muskens**, M. T. Borgström, E. P. A. M. Bakkers, J. Gómez Rivas, *Giant optical birefringence in ensembles of semiconductor nanowires*, Appl. Phys. Lett. **89**, 233117:9 (2006) [VJNano]
11. **O. L. Muskens**, N. Del Fatti, F. Vallée, *Femtosecond response of a single small metal nanoparticle*, Nano. Lett. **6**(3), 552:556 (2006)

¹ Note: several articles were selected for Virtual Journal of Biomedical Optics (VJBO), Virtual Journal of Nanoscale Science & Technology (VJNano), and Virtual Journal of Ultrafast Science (VJUltra).

10. **O. L. Muskens**, N. Del Fatti, F. Vallée, J.-R. Huntzinger, M. Broyer, *Single metal nanoparticle absorption spectroscopy: nanoparticle characterization*, Appl. Phys. Lett. **88**, 063109:11 (2006) [VJNano]
9. **O. L. Muskens**, D. Christofilos, N. Del Fatti, F. Vallée, *Optical response of a single noble metal nanoparticle*, J. Opt. A: Pure Appl. Opt. **8**(4), S264:272 (2006)
8. **O. L. Muskens**, J. I. Dijkhuis, *Interactions of ultrashort strain solitons and terahertz two-level systems in photoexcited ruby*, Phys. Rev. B **71**, 104304-1:11 (2005) [VJUltra]
7. **O. L. Muskens**, A. V. Akimov, J. I. Dijkhuis, *Coherent interactions of terahertz strain solitons and electronic two-level systems in photoexcited ruby*, Phys. Rev. Lett. **92**, 035503-1:4 (2004) [VJUltra]
6. **O. L. Muskens**, J. I. Dijkhuis, *Trains of ultrashort acoustic solitons*, Phys. Stat. Sol. (b) **241**(15), 3469:3473 (2004)
5. **O. L. Muskens**, J. I. Dijkhuis, *Inelastic light scattering by trains of ultrashort acoustic solitons in sapphire*, Phys. Rev. B **70**, 104301-1:8 (2004)
4. **O. L. Muskens**, J. I. Dijkhuis, *High-amplitude, ultrashort, longitudinal strain solitons in sapphire*, Phys. Rev. Lett. **89**, 285504-1:4 (2002) [VJUltra]
3. **O. L. Muskens**, J. I. Dijkhuis, *Propagation of ultrashort acoustic wavepackets in PbMoO₄ studied by Brillouin spectroscopy*, Physica B **316**, 373:376 (2002)
2. M. van der Voort, **O. L. Muskens**, A. V. Akimov, A. B. Pevtsov, J. I. Dijkhuis, *Dynamics of vibrations in a mixed amorphous-nanocrystalline Si system*, Phys. Rev. B **64**(4), 045203-1:10 (2001)
1. M. van der Voort, A. V. Akimov, **O. L. Muskens**, J. I. Dijkhuis, N. A. Feoktistov, A. A. Kaplyanski, A. B. Pevtsov, *Phonon dynamics in amorphous and nanocrystalline silicon*, J. Lumin. **83**, 161:165 (1999)

B. Submitted

1. **O. L. Muskens**, A. Lagendijk, *Spectroscopy of diffuse light transport in random media using white-light speckle correlations* [submitted to Phys. Rev. E]
2. S. L. Diedenhofen, **O. L. Muskens**, A. Hartsuiker, W. L. Vos, R. Algra, E.P.A.M. Bakkers, J. Gómez Rivas, *Broadband anti-reflection coatings fabricated from tapered nanowires* [submitted to Adv. Mater.]
3. **O. L. Muskens**, S. L. Diedenhofen, R. Algra, E. P. A. M. Bakkers, B. Kaas, A. Lagendijk, *Strongly photonic resonant nanowire materials* [submitted to Nature Mater.]
4. **O. L. Muskens**, P. Billaud, M. Broyer, N. del Fatti, F. Vallée, *Optical extinction spectrum of a single metal nanoparticle: quantitative characterization of a particle and of its local environment* [submitted to Phys. Rev. B]

C. Book chapters

3. J. Gómez Rivas, **O. L. Muskens**, S. L. Diedenhofen, M. T. Borgström, E. P. A. M. Bakkers, *Optical anisotropy of semiconductor nanowires*, to appear in *One-dimensional nanostructures*, ed. Z. M. Wang, Springer Series of Nanoscale Science and Technology (2008)
2. **O. L. Muskens**, J. I. Dijkhuis, *High-amplitude, ultrashort strain solitons in solids*, in *Non-equilibrium dynamics of semiconductors and nanostructures*, ed. K.-T. Tseng, CRC Press, Boca Raton (FL), 15:45 (2005)
1. **O. L. Muskens**, J. I. Dijkhuis, *Propagation and diffraction of picosecond acoustic wave packets in the soliton regime*, in *Optical Solitons: Theory and Experimental Challenges*, ed. K. Porsezian, Springer Verlag, Heidelberg, 391:405 (2003)

D. Popular science articles

1. **O. L. Muskens**, *De kortste knal ter wereld: nano-akoestische solitonpulsen*, Nederlands Tijdschrift voor Natuurkunde, maart, 4:7 (2005) [1st prize competition NTvN]

E. Conference proceedings (refereed)

9. **O. L. Muskens**, J. Gómez Rivas, *Enhanced light extraction from emitters close to clusters of resonant metal nanoantennas*, Mat. Sc. Eng. B **149**, 216:219 (2008)

8. N. Del Fatti, **O. Muskens**, F. Vallée, J. R. Huntzinger, P. Billaud, M. Broyer, *Détection et caractérisation optiques d'une nanoparticule métallique isolée*, J. Phys. IV France **135**, 43 :50 (2006)
7. **O. Muskens**, N. Del Fatti, F. Vallée, *Absorption spectroscopy and identification of single metal nanoparticles*, Proc. SPIE Int. Soc. Opt. Eng. **5927**, 138:147 (2005)
6. N. Del Fatti, **O. Muskens**, D. Christofilos, F. Vallée, *Optical spectroscopy of metal nanoparticles: ultrafast response and single particle detection*, Proc. SPIE Int. Soc. Opt. Eng. 5725, 318:328 (2005)
5. **O. L. Muskens**, J. I. Dijkhuis, *Development of trains of ultrashort strain solitons in sapphire and ruby*, Proc. SPIE Int. Soc. Opt. Eng. **5352**, 144:157 (2004)
4. P. J. S. van Capel, **O. L. Muskens**, E. W. Hesselink, J. I. Dijkhuis, *Towards ultrafast pump-probe spectroscopy on trains of strain solitons*, Phys. Stat. Sol. (c) **1**(11), 2753:2756 (2004)
3. **O. L. Muskens**, S. Purushotoman, A. V. Akimov, J. I. Dijkhuis, *The 29-cm⁻¹ ruby phonon detector as a probe for ultrashort strain solitons*, J. Lumin. **108**, 281:284 (2004)
2. **O. L. Muskens**, J. I. Dijkhuis, *Ultrashort strain soliton formation in sapphire and ruby*, J. Lumin. **108**, 297:299 (2004)
1. **O. L. Muskens** and J. I. Dijkhuis, *Diffraction and the formation of picosecond acoustic solitons in condensed matter* Proceedings of 16th International Symposium on Nonlinear Acoustics (2003)

Presentations

A. Invited presentations

11. N. Del Fatti, **O. Muskens** and F. Vallée, *European Conference on atoms, molecules and photons (ECAMP IX)*, May 2007, Crete (Greece)
10. **O. L. Muskens**, *Nanotron Symposium*, May 2007, San Sebastian (Spain)
9. N. Del Fatti, **O. Muskens**, F. Vallée, *SPIE Optics and Photonics 2006*, Aug. 2006, San Diego (USA)
8. F. Vallée, N. Del Fatti, and **O. Muskens**, *SPIE Optics and Photonics 2005*, Aug. 2005, San Diego (USA)
7. **O. Muskens**, N. Del Fatti, and F. Vallée, *14th International Laser Physics Workshop*, July 2005, Kyoto (Japan)
6. **O. L. Muskens** and J. I. Dijkhuis, *Gordon Research Conference on Photothermal and Photoacoustic Phenomena*, June 2005, Trieste (Italy)
5. N. Del Fatti, **O. Muskens**, and F. Vallée, *SPIE Photonics West 2005*, Jan. 2005, San Jose (USA)
4. **O. Muskens**, D. Christofilos, N. Del Fatti, F. Vallée, J. R. Huntzinger, and M. Broyer, *Fifth France-Japan Workshop on Nanomaterials*, Oct. 2004, Bordeaux (France)
3. **O. L. Muskens** and J. I. Dijkhuis, *11th Int. Conf. on Phonon Scattering in Condensed Matter, Phonons 2004*, July 2004, St. Petersburg (Russian Federation)
2. **O. L. Muskens** and J. I. Dijkhuis, *SPIE Photonics West 2004*, Jan. 2004, San Jose (USA)
1. **O. L. Muskens**, J. I. Dijkhuis, *Int. Workshop on Optical Solitons: Theory and Experiments, OSTE 2002*, Jan. 2002, Cochin (India)

B. Oral presentations

17. J. Gomez Rivas, S. Diedenhofen, **O.L. Muskens**, E.P.A.M. Bakkers, M. T. Borgstrom, *SPIE Optics & Photonics 2007*, Aug. 2007, San Diego (USA)
16. J. A. Sanchez-Gil, V. Giannini, J. V. Garcia-Ramos, **O. L. Muskens**, J. Gomez Rivas, *SPIE Optics & Photonics 2007*, Aug. 2007, San Diego (USA)
15. N. Del Fatti, F. Vallée, J. Burgin, **O. Muskens**, P. Langot, *Int. Conf. on Phonon scattering in Condensed Matter (Phonons 2007)*, July 2007, Paris (France)
14. **O. L. Muskens**, V. Giannini, J. A. Sánchez Gil, J. Gómez Rivas, *3rd International Conference on Surface Plasmon Polaritons SPP3*, June 2007, Dijon (France)
13. S. L. Diedenhofen, **O. L. Muskens**, M. T. Borgström, E.P.A.M. Bakkers, J. Gómez Rivas, *CLEO Europe 2007*, June 2007, Munich (Germany)

12. J. A. Sánchez-Gil, V. Giannini, J. V. García-Ramos, E. R. Méndez, **O. Muskens**, J. Gómez Rivas, *Nano Spain*, Sevilla, Spain, March 12-16, 2007.
11. **O. L. Muskens**, J. Gómez Rivas, *National Scientific Meeting FOM*, Jan. 2007, Veldhoven (Netherlands)
10. J. Gómez Rivas, **O. L. Muskens**, S. Diedenhofen, J. Treffers, T. Rümke, M. T. Borgström, E. P. A. M. Bakkers, *National Scientific Meeting FOM*, Jan. 2007, Veldhoven (Netherlands)
9. **O. L. Muskens**, M. T. Borgström, E.P.A.M. Bakkers, J. Gómez Rivas, *Symposium of the European Network on Semiconductor Nanowires (NODE)*, Sep. 2006, Eindhoven (Netherlands)
8. **O. L. Muskens**, J. Gómez Rivas, *SPIE Optics & Photonics 2006*, Aug. 2006, San Diego (USA)
7. **O. L. Muskens**, M. van Weert, M. T. Borgström, E. P. A. M. Bakkers, *J. Gómez Rivas, EMRS Spring Meeting 2006*, May 2006, Nice (France)
6. **O. L. Muskens**, M. van Weert, M. T. Borgström, E. P. A. M. Bakkers, J. Gómez Rivas, *MRS Spring Meeting 2006*, Apr. 2006, San Francisco (USA)
5. **O. L. Muskens**, J. I. Dijkhuis, *National Scientific Meeting FOM*, Dec. 2003, Veldhoven (Netherlands)
4. **O. L. Muskens**, A. V. Akimov, S. V. Purushotoman, J. I. Dijkhuis *Int. Conf. on Dynamical Processes in Excited States of Solids, DPC 2003*, Aug. 2003, Christchurch (New Zealand)
3. **O. L. Muskens**, J. I. Dijkhuis, *Int. Symposium on Nonlinear Acoustics, ISNA 16*, Aug. 2002, Moscow (Russian Federation)
2. **O. L. Muskens**, J. I. Dijkhuis, *National Scientific Meeting FOM*, Dec. 2001, Veldhoven (Netherlands)
1. **O. L. Muskens**, J. I. Dijkhuis, *10th Int. Conf. on Phonon Scattering in Condensed Matter, Phonons 2001*, Aug. 2001, Hanover NH (USA)

C. Seminars and colloquia

4. **O. L. Muskens**, *Ornstein Colloquium*, Oct. 2007, Utrecht (Netherlands)
3. **O. L. Muskens**, *MONOS Seminar*, March 2007, Leiden (Netherlands)
2. **O. L. Muskens**, *Université Pierre et Marie Curie Paris VI*, Sept. 2003, Paris (France)
1. **O. L. Muskens**, *Ornstein Colloquium*, Nov. 2002, Utrecht (Netherlands)

D. Eight posters at international conferences and at the national scientific meeting of FOM

References

Prof. dr. Ad Lagendijk
 FOM-Institute for Atomic and Molecular Physics AMOLF
 Amsterdam, The Netherlands
 lagendijk@amolf.nl
 Tel: +31-(0)20-608 1234

Prof. dr. Fabrice Vallée
 CNRS / Université Lyon 1
 Lyon, France
 fvallee@lasim.univ-lyon1.fr
 Tel: +33-(0)47-243 2654

Prof. dr. Jaap I. Dijkhuis
 Debye Institute, Department of Physics and Astronomy
 University of Utrecht, Utrecht, The Netherlands
 J.I.Dijkhuis@phys.uu.nl
 Tel: +31-(0)30-253 2319 / 3302