

Curriculum Vitae

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Prof.dr. Albert Polman

Scientific Group Leader

Program Leader, NWO Focus Group Light Management in New Photovoltaic Materials

NWO Institute AMOLF, Science Park 104, 1098 XG Amsterdam, the Netherlands

Professor of Photonic Materials for Photovoltaics, University of Amsterdam

Phone: +31 20 754 7100, E-mail: polman@amolf.nl www.erbium.nl www.lmpv.nl

www.researcherid.com/rid/D-1490-2011



Personal details

Date of birth: April 21, 1961

Place of birth: Groningen, The Netherlands

Nationality: Dutch

Scientific education

1989 PhD Thesis: *Beam-induced phase transformations in silicon* (Utrecht University, advisors: F.W. Saris and W.C. Sinke)

1985 MSc Physics, Utrecht University (The Netherlands)

1981 BSc Physics, Utrecht University (The Netherlands)

Albert Polman is one of the early pioneers of the research area of nanophotonics. His research group focuses on the realization of nanoscale metamaterials with tailored optical properties that do not exist in nature. He also designs and fabricates novel photovoltaic architectures with enhanced power conversion efficiency based on semiconductor and dielectric metasurfaces. Polman's group is the inventor of angle-resolved cathodoluminescence microscopy, a novel super-resolution microscopy technique that creates images with 10 nanometer resolution. The instrument is brought on the market by the start-up Delmic BV that Polman co-founded.

Past positions

2017-2018 Visiting Research Fellow, University of New South Wales, Sydney (sabbatical leave)

2006-2013 Director, FOM Institute AMOLF

2005 Head, Center for Nanophotonics, FOM Institute AMOLF

2003-2004 Visiting associate, California Institute of Technology, USA (sabbatical leave)

1999-2004 Department Head, FOM Institute AMOLF

1996-2011 Professor of Nanophotonics, University of Utrecht

1996-present Tenured scientific group leader, FOM Institute AMOLF

1991-1996 Scientific project leader, FOM Institute AMOLF

1989-1991 Post-doctoral staff researcher, AT&T Bell Laboratories (Murray Hill, NJ, USA)

1985-1989 PhD researcher, FOM Institute AMOLF

Distinctions and awards

2018 Highly Cited Researcher (Web of Science, Clarivate Analytics)

2017 Frew Fellow, Australian Academy of Sciences

2017 Highly Cited Researcher (Web of Science, Clarivate Analytics)

2017 SolarPower R&D Award (Angel Business Communications)

2017 Research into the Science of Light Prize, European Physical Society (EPS)

2016 ERC Advanced Investigator Grant

2016 Fellow, Optical Society of America (OSA)

2014 Physica Prize, Netherlands Physical Society (NNV)

2014 Innovation in Materials Characterization Award, Materials Research Society (MRS)

2014 Julius Springer Prize for Applied Physics

2012 ENI Renewable and Non-Conventional Energy Prize

2010 ERC Advanced Investigator Grant

2010 Fellow, Materials Research Society (MRS, USA)

2009 Member, Royal Netherlands Academy of Arts and Sciences (KNAW)

2008 Honorary Member, International Committee Ion Beam Modification of Materials (IBMM) conference

2007 Member, Royal Dutch Society of Sciences (Koninklijke Hollandse Maatschappij der Wetenschappen)

Awards for group members:

- 2016 Rubicon Award NWO (J. van de Groep)
- 2015 *Cum laude* PhD award (J. van de Groep)
- 2014 Best PhD thesis in solar energy in The Netherlands (M.C. van Lare)
- 2012 FOM prize for best PhD thesis application chapter (E.J.R. Vesseur)
- 2011 Shell award for the best master thesis in physics (J. van de Groep)
- 2009 *Cum laude* PhD award (E. Verhagen)
- 2010 FOM prize for best PhD thesis (E. Verhagen)
- 2010 FOM prize for best PhD thesis application chapter (E. Verhagen)
- 1996 *Cum laude* PhD award (G.N. van den Hoven)

Publications, patents and presentations

>300 publications in refereed international journals; ~30.000 citations; H-index: 86. Co-inventor on 11 patent applications. >200 invited presentations at international conferences, of which many as plenary or keynote speaker.

PhDs, postdocs, undergraduate students supervised, prizes

Total supervised: 25 PhD students, 14 postdocs, 31 undergraduate students.

Memberships/program directorships (selection)

- 2018-present Member, Jury EPS Research into the science of light prize
- 2017-present Chair, Steering Committee National SOLARLab initiative
- 2016-present Member, International Advisory Board, Winton Renewable Energy Program, Cambridge University
- 2014-present Chair, Member, Royal Netherlands Academy of Arts and Sciences (KNAW), new member selection committee
- 2014-present Chair, NWO Theme Committee Materials Science
- 2014-present Chair, National Science Agenda (NWA) Materials Route
- 2014-2018 Chair, Awards committee, Materials Research Society (MRS)
- 2010-2018 Member, Executive Board National Nano-initiative NanoNextNL (125 M€ national program)
- 2004-2017 Member, Program Committee Joint Solar Panel Industrial Partnership Program
- 2016 Chair, International Evaluation Panel, Faculty of Applied Physics, Delft University of Technology
- 2010-2016 Member, Young Energy Scientists Advisory Board of FOM
- 2015-2016 Member, Scientific Advisory Council Advanced Research Center for Nanolithography
- 2014-2015 Member, Program Committee, NanoCity National nanoscience and technology conference
- 2014-2015 Member, FOM Committee Evaluation Industrial Partnership Programs
- 2013-2014 Member, KNAW committee National policy for use of intellectual property
- 2008-2012 Member, Steering Committee Physics@FOM Veldhoven, yearly national physics conference
- 2004-2013 Member, Steering Committee FOM-Philips IPP Program *Improved solid state light sources*
- 2002-2010 Program director, Flagship *Nanophotonics*, Dutch Nanotechnology Program NANONED
- 2005-2008 Chair/Member, Nanophysics and Technology Advisory Board of FOM
- 1999-2008 Program director, National FOM research program *Photon physics in optical materials*
- 1998-2008 Secretary/Member, International Committee, Ion Beam Modification of Materials conference
- 2004-2005 Member, Board of Directors, Materials Research Society (Pittsburgh)

Journal editorships

- 2014-present Member, Board of Reviewing Editors, Science (AAAS)
- 2014-present Member, Editorial Advisory Board ACS Photonics (American Chemical Society)
- 2014-present Member, Editorial Advisory Board Applied Physics Reviews (American Physical Society)
- 2012-present Member, Editorial Advisory Board Advanced Optical Materials (Wiley)
- 2007-present Member, Editorial Advisory Board Nano Letters (American Chemical Society)
- 2000-2006 Member, Advisory Editorial Board of Physica B (Elsevier)
- 2000 Volume Organizer (co-editor), MRS Bulletin

Industrial collaborations/contracts

Polman is cofounder, shareholder and advisor of the start-up company Delmic BV.

- 2017-present Shell, Exasun, Eternal Sun, Levitech and Tempres Systems: development of Si-based tandem solar cells
- 2005-present ThermoFisher/FEI: time-resolved cathodoluminescence microscopy
- 2013-present ASML: development of a roadmap for nanolithography for photovoltaics
- 2012-present Delmic: development of angle- and time-resolved cathodoluminescence microscopy
- 2005-present Philips Research: development of nanophotonic concepts for improved solid-state light sources

2005-present	Philips Research/SCIL Nanoimprint Solutions: development and application of large-area soft nano-imprint lithography; joint project on banknote security with DNB (Dutch Central Bank)
2017	Consultant, Lucros Investment
2005-2010	FEI Company: IPP program on focused ion beam nanofabrication; cathodoluminescence microscopy
1999-2001	Symmorphix: development and commercialization of erbium-doped planar optical amplifiers
1996-2000	AKZO-Nobel: development of polymer optical amplifiers
1995-2002	ST Microelectronics: development of silicon-based light sources
1991-1994	PTT/KPN: optical doping, development of planar optical amplifiers
1989-1991	AT&T Bell Laboratories: optical doping, integrated optics

Conference Organisation

2017	Co-chair, Workshop <i>Electron beam spectroscopy for nanophotonics</i> (Barcelona)
2014	Co-chair, Workshop <i>Electron beam spectroscopy for nanophotonics</i> (Amsterdam)
2012	Co-chair, Symposium <i>Optical nanostructures and advanced materials for photovoltaics</i> (OSA, Eindhoven)
2006	Chair, First Gordon Research Conference <i>Plasmonics - optics at the nanoscale</i> (Keene, NH, USA)
2004	Co-organizer, Symposium <i>Nanophotonic materials</i> , European MRS (Strasbourg)
2003	Co-chair, MRS Spring Meeting (San Francisco, USA)
1998	Chair, 11 th International Conference on Ion Beam Modification of Materials (Amsterdam)
1997	Co-organiser, Symposium <i>Materials and devices for Si based opto-electronics</i> , MRS Spring Meeting (San Francisco, 1997)
1996	Co-organiser, Symposium <i>Rare earth doped semiconductors II</i> , MRS Spring Meeting (San Francisco, 1996)
1994	Co-organiser, Symposium <i>Film synthesis and growth using energetic beams</i> , MRS Fall Meeting (Boston, 1994)

Recent key publications

1. *Photovoltaic materials: record efficiencies and future challenges*
A. Polman, E.C. Garnett, B. Ehrler, M.W. Knight, and W.C. Sinke, [Science **352**, 207 \(2016\)](#)
2. *Nanophotonics: shrinking light-based technology*, A.F. Koenderink, A. Alù, and A. Polman, [Science **348**, 516 \(2015\)](#)
3. *Plasmoelectric potentials in metal nanostructures*, M.T. Sheldon, J. van de Groep, A.M. Brown, A. Polman and H.A. Atwater, [Science **346**, 828 \(2014\)](#)
4. *Experimental realization of an epsilon-near-zero metamaterial at visible wavelengths*, R. Maas, J. Parsons, N. Engheta and A. Polman, [Nature Photon. **7**, 907 \(2013\)](#)
5. *Deep-subwavelength imaging of the modal dispersion of light*
R. Sapienza, T. Coenen, J. Renger, M. Kuttge, N.F. van Hulst, and A. Polman, [Nature Mater. **11**, 781 \(2012\)](#)