

Markus Aspelmeyer (* 14.6.1974, Schongau, Germany)

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Focus of Research

Quantum optical control of micro- and nanomechanics (quantum opto-mechanics)
Precision interferometry with low-noise crystalline mirrors
Fundamentals of quantum optics and foundations of quantum physics
Measurements of small-scale gravitational forces

Education

2002 PhD (Dr. rer. nat.) in Physics, Ludwig-Maximilians-Universität (LMU) Munich, Germany (with J. Peisl)
2000 Bachelor (Bakk.-Phil.) in Philosophy, Munich School of Philosophy, Germany
1998 Diploma (Dipl.-Phys.) in Physics, Ludwig-Maximilians-Universität (LMU) Munich

Career History

2009 – Professor of Physics (Full Professor), ‘Quantum Foundations and Quantum Information on the Nano- and Microscale’, Faculty of Physics, University of Vienna
2007 – 2009 Senior Scientist, Institute for Quantum Optics and Quantum Information (IQOQI)
2005 – 2006 Junior Scientist, Institute for Quantum Optics and Quantum Information (IQOQI), Austrian Academy of Sciences, Vienna, Austria
2003 – 2006 Assistant Professor (Univ.-Ass.), Faculty of Physics, University of Vienna
2002 – 2003 Feodor Lynen Postdoctoral Fellow of the Alexander von Humboldt Foundation at the University of Vienna with Anton Zeilinger
1999 – 2001 Research Assistant, Ludwig-Maximilians-Universität (LMU) Munich, Germany

Various visiting positions, including at the California Institute of Technology (Caltech), the Institute for Condensed Matter Theory (ICMT) at the University of Illinois at Urbana-Champaign (UIUC), the Institute for Theoretical Atomic, Molecular and Optical Physics (ITAMP) at the Harvard-Smithsonian Center for Astrophysics and the Harvard Physics Department.

Honors and Awards

2017 Science Prize of the City of Vienna
2016 Berthold Leibinger Innovation Prize, 2nd Prize
2015 AMA Association for Sensors and Measurement Innovation Award
2015 ERC Consolidator Grant, European Research Council
2014 GEWINN Young Entrepreneur Prize 2014, Winner in category “High-Tech”
2014 Houska Prize 2014 Finalist, B&C Privatstiftung
2012 W.M. Keck Institute for Space Studies Distinguished Visiting Scholar, Caltech
2010 Friedrich Wilhelm Bessel Research Award, Alexander von Humboldt-Foundation
2009 ERC Starting Grant, European Research Council
2008 START Prize, Austrian Ministry of Science and Education (BMWF)
2008 Fritz Kohlrausch Prize, Austrian Physical Society
2007 Ignaz L. Lieben Prize, Austrian Academy of Sciences
2007 Fresnel Prize, European Physical Society
2002 Feodor Lynen Fellowship, Alexander von Humboldt Foundation

Memberships

- 2015 World Technology Network, Fellow
- 2013 European Academy of Sciences and Arts, Member
- 2013 American Physical Society, Fellow
- 2010 Austrian Academy of Sciences, Member of the "Junge Kurie" (Young Academy)

Editorial Boards

- 2017 Classical and Quantum Gravity, Guest Editor
- 2016 Quantum Science and Technology, Board Member
- 2011 Foundations of Physics, Guest Editor
- 2008, 2014 New Journal of Physics, Guest Editor

Institutional Responsibilities

- 2014 - Speaker of the Vienna Graduate School on "Complex Quantum Systems" (CoQuS)
- 2012 - Member of the Faculty Board, Faculty of Physics, University of Vienna, Austria
- 2010 - Speaker of the Vienna Center for Quantum Science and Technology (VCQ)
- 2010 - Partner Investigator, Australian Research Council (ARC) Center for Engineered Quantum Systems (EQUS), Australia

Commissions of Trust

- 2015 - Chairman of the Advisory Board, Crystalline Mirror Solutions GmbH
- 2013 - Scientific Advisory Board of the Max-Planck Institute for Gravitational Physics (Albert-Einstein Institute)
- 2011 - APART and DOC Prize Committee of the Austrian Academy of Sciences
- 2014 - 2016 Member of the Board, Chemisch-Physikalische Gesellschaft (CPG)
- 2013 - 2014 Executive Committee (Member at Large), Topical Group on Quantum Information, American Physical Society
- 2012 - 2015 Board of Directors, Young Academy ("Junge Kurie") of the Austrian Academy of Sciences

Review Panel Member of the Swiss National Science Foundation (SNF), the European Commission (EC), the U.S. National Science Foundation (NSF), the German Research Foundation (DFG), the French Research Agency (ANR), the Netherland National Research Council (NWO)

Other Activities

- 2013 Co-Founder of 'Crystalline Mirror Solutions GmbH'
- 2010 Founding Member of the Vienna Center for Quantum Science and Technology (VCQ)

Organization of Conferences

- 2016 "Quantum Physics and Gravity", 5-week thematic program funded by the Erwin-Schrödinger-Institute (ESI), with Caslav Brukner, Daniel Grumiller, Domenico Giulini, Soo-Jong Rey
- 2015 "Gravitation 2015", with D. Grumiller; 4-week centennial event at the Austrian Academy of Sciences targeted towards a general audience; including 8 public lectures, an education program for school classes, guided public exhibit and a 3-day scientific workshop "100 years of curved space-time"; the general program attracted more than 2,000 visitors
- 2015 "Probing the Mystery: Theory and Experiment in Quantum Gravity", Galiano Island, Canada, with Philip C. E. Stamp, William G. Unruh, Robert M. Wald
- 2014 Invited Session on "Quantum Foundation Meets General Relativity", 14th Växjö Conference "Quantum Theory: from Problems to Advances", Sweden; Session Chair,

- with Caslav Brukner
- 2014, 2017 “International Winterschool on New Developments in Solid State Physics”, Mauterndorf Castle, Austria; Member of the Organizing Committee
- 2013 Conference “Quantum Nano- and Micromechanics”, Monte Verita, Switzerland, with Tobias Kippenberg and Martino Poggio
- 2012 OSA Incubator Meeting on “Cavity Optomechanics”, Washington D.C., USA, with Pierre Meystre
- 2012 11th International Conference on Quantum Measurement, Information and Computing “QCMC2012”, Vienna, Austria, Co-Organizer
- 2010 International Academy Traunkirchen Workshop “What exists in the quantum world?”, Traunkirchen, Austria, with Anton Zeilinger
- 2010 438th WE-Heraeus Seminar “Quantum Optics of Nano- and Micromechanical Systems”, Bad Honnef, Germany, with Florian Marquardt and Tobias Kippenberg
- 2009 2nd Vienna Symposium “Foundations of Modern Physics”, Vienna, with Anton Zeilinger and Caslav Brukner
- 2008 423rd WE-Heraeus Seminar “New Frontiers in Quantum Information Science”, Bad Honnef, Germany, with Michael Wolf
- 2008 CLEO/QELS “Joint Symposium on Novel Resonators”, San Jose, CA, USA, Symposium Chair, with Hui Cao

Third-Party Funding

More than 11 Million Euros in competitive third-party funding through > 30 projects, including 3 ERC projects (Starting, Consolidator, Proof of Concept) and 1 FWF funded START Award.

Selected Publications and Invited Presentations

More than 100 publications, 17 in Nature and Science, 2 patents, including

- “Non-classical correlations between single photons and phonons from a mechanical oscillator”. R. Riedinger, S. Hong, R. A. Norte, J. A. Slater, J. Shang, A. G. Krause, V. Anant, M. Aspelmeyer, S. Gröblacher, Nature 530, 313-316 (2016)
- “Cavity cooling of an optically levitated sub-micron particle”. N. Kiesel, F. Blaser, U. Delic, D. Grass, R. Kaltenbaek, M. Aspelmeyer, PNAS USA 110, 14180 (2013)
- “Tenfold reduction of Brownian noise in optical interferometry”. G. D. Cole, W. Zhang, M. J. Martin, J. Ye, M. Aspelmeyer, Nature Photonics 7, 644–650 (2013)
- “Laser cooling of a nanomechanical oscillator into its quantum ground state”. J. Chan, T. P. Mayer Alegre, A. H. Safavi-Naeini, J. T. Hill, A. Krause, S. Gröblacher, M. Aspelmeyer, O.Painter, Nature 478, 89-92 (2011)
- „Observation of strong coupling between a micromechanical resonator and an optical cavity field“. S. Gröblacher, K. Hammerer, M. R. Vanner, M. Aspelmeyer, Nature 460, 724-727 (2009)
- „Self-cooling of a micro-mirror by radiation pressure“. S. Gigan, H. R. Böhm, M. Paternostro, F. Blaser, G. Langer, J. B. Hertzberg, K. Schwab, D. Baeuerle, M. Aspelmeyer, A. Zeilinger, Nature 444, 67-70 (2006)

More than 200 invitations to international conferences, workshops, colloquia and advanced graduate schools, more than 20 public talks, including

- Kavli Colloquium, TU Delft, March 2017, Delft, Netherlands
- Ångström Lecture, Uppsala University, May 2016, Uppsala, Sweden
- Enrico Fermi Colloquium, LENS, November 2015, Florence, Italy
- Plenary Lecture, Photonics West, February 2013, San Francisco, USA
- Plenary Lecture, German Physical Society Annual Meeting, March 2012, Stuttgart, Germany
- Stoner Colloquium, University of Leeds, April 2012, Leeds, UK