

## **Markus Aspelmeyer** (\* 14.6.1974, Schongau, Germany)

Professor of Physics, University of Vienna  
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and  
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### **Focus of Research**

Quantum optical control of solid-state micro- and nano-objects (quantum opto-mechanics)  
Quantum foundations and macroscopic quantum physics  
Precision tests of gravity and gravitational quantum physics

### **Education**

2002 PhD (Dr. rer. nat.) in Physics, Ludwig-Maximilians-Universität (LMU) Munich, Germany (with Johann Peisl)  
2000 Bachelor (Bakk.-Phil.) in Philosophy, Munich School of Philosophy, Germany  
1998 Diploma (Dipl.-Phys.) in Physics, Ludwig-Maximilians-Universität (LMU) Munich  
1993 Abitur, Gesamtschule Gymnasium Schongau, Germany

### **Career History**

2019 – Scientific Director, Institute for Quantum Optics and Quantum Information (IQOQI) Vienna, Austrian Academy of Sciences, Vienna, Austria  
2009 – Professor of Physics (Full Professor), Faculty of Physics, University of Vienna  
2007 – 2009 Senior Scientist, IQOQI, Austrian Academy of Sciences, Vienna, Austria  
2005 – 2006 Junior Scientist, 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 (Host: Anton Zeilinger)  
1999 – 2001 Research Assistant, Ludwig-Maximilians-Universität (LMU) Munich, Germany

### **Honors and Awards**

2020 ERC Synergy Grant, European Research Council  
2017 Science Prize of the City of Vienna  
2016 Berthold Leibinger Innovation Prize, 2<sup>nd</sup> 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

## **Elected Memberships**

- 2018 Academy of Sciences and Humanities in Hamburg, Corresponding Member
- 2018 Austrian Academy of Sciences, Corresponding Member
- 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**

- 2018 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**

- 2019 - Managing Director, IQOQI Vienna, Austrian Academy of Sciences
- 2014 - 2020 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**

- 2021 - Scientific Advisory Board, Max-Planck Institute for Quantum Optics in Garching
- 2020 - Scientific Advisory Board, Center for Integrated Quantum Science and Technology (IQST)
- 2019 - Member of the Board of Trustees, Physik in unserer Zeit
- 2019 - Scientific Advisory Board, Munich Center for Quantum Science and Technology (MCQST)
- 2015 - 2019 Chairman of the Advisory Board, Crystalline Mirror Solutions GmbH
- 2014 - 2016 Member of the Board, Chemisch-Physikalische Gesellschaft (CPG)
- 2013 - 2018 Scientific Advisory Board, Max-Planck Institute for Gravitational Physics (Albert-Einstein Institute)
- 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
- 2011 - APART and DOC Prize Committee of the Austrian Academy of Sciences

Review Panel Member among others for the Alexander von Humboldt Foundation, 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' (now: 'Thorlabs Crystalline Solutions')
- 2010 Founding Member of the Vienna Center for Quantum Science and Technology (VCQ)

## **Organization of Conferences (selection)**

- 2020 Summer School "Gravitational Quantum Physics", Vienna, Austria, with Veronika Baumann, Christopher Hilweg, Marius Krumm, David Trillo

- 2019 “ITAMP workshop on Laboratory Cosmology: AMO Physics Techniques and Applications”, ITAMP, Harvard, USA, with Hossein Sadeghpour, Andrew Geraci
- 2019 “Primordial black holes, de Sitter space and quantum tests of gravity”, DESY Hamburg, Germany, with Wilfried Buchmüller, Karsten Danzmann, Georgi Dvali, Elisabetta Gallo, Jürgen Schmitt, Roman Schnabel
- 2018 “Relativistic Quantum Information North (RQI-N) 2018”, Vienna, Austria, with Caslav Brukner, Alessio Belenchia, Esteban Castro Ruiz, Flaminia Giacomini, Philip Höhn
- 2018 Gordon Research Conference on “Mechanical Systems in the Quantum Regime”, Ventura, CA, USA, with John Teufel
- 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

### **Selected Publications and Invited Presentations**

ISI Highly Cited Researcher (since 2017), more than 100 publications, 18 in Nature and Science, 2 patents, including

- “Measurement of Gravitational Coupling between Millimeter-Sized Masses”. T. Westphal, H. Hepach, J. Pfaff, M. Aspelmeyer, *Nature* 591, 225-228 (2021)
- “Cooling of a levitated nanoparticle to the motional quantum ground state”. U. Delić, M. Reisenbauer, K. Dare, D. Grass, V. Vuletić, N. Kiesel, M. Aspelmeyer, *Science* 367, 892 (2020)
- “Quantum Superposition of Massive Objects and the Quantization of Gravity”. A. Belenchia, R. Wald, F. Giacomini, E. Castro-Ruiz, Č. Brukner, M. Aspelmeyer. *Phys. Rev. D* 98, 126009 (2018)
- “Tenfold reduction of Brownian noise in optical interferometry”. G. D. Cole, W. Zhang, M. J. Martin, J. Ye, M. Aspelmeyer, *Nature Photonics* 7, 644 (2013)
- „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 (2009)

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

- Schrödinger Lecture, Trinity College Dublin, November 2021, Ireland
- Jentschke Lecture, DESY, November 2018, Hamburg, Germany
- 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