

Curriculum Vitae

Ing. Dr. Manfred Johann Mark

Date of birth: 13.09.1977 in Innsbruck, Austria
Nationality: Austria
Marital status: married, one child
Contact: General-Eccher-Strasse 45/102
6020 Innsbruck, Austria



Scientific career and education

2014-now Senior Scientist at the University of Innsbruck, Austria in the group of Francesca Ferlaino
2012-2014 Postdoc at the University of Innsbruck, Austria in the group of H.-C. Nägerl.
2008-2012 Doctoral student at the University of Innsbruck, Austria, in the group of H.-C. Nägerl. Doctoral thesis topic: "Experiments with tunable quantum gases in optical lattices".
2006 Participant of the UREKA (Undergraduate Research Experience & Knowledge Award) Program from the Science Foundation Ireland in the Quantum Optics group of Dr. Sile Nic Chormaic at the Tyndall National Institute.
2002-2007 Study of physics at the University of Innsbruck, Austria. Diploma thesis topic: "Wechselwirkungseffekte eines Cäsium-BECs in eindimensionalen Gittern".

Teaching experience

University courses

- Build-up of a new practical course for students: Laborpraktikum der Experimentalphysik: Elektronik (SS12, WS12)
- Proseminar Elektromagnetismus und Optik (SS09)
- Proseminar Mechanik und Wärme (SS10, SS11, WS11)
- Grundpraktikum 1 (WS10)
- Fortgeschrittenen-Praktikum 2 (WS11, WS09)

Invited lectures at International schools

- Graduate Days of The Hamburg Centre for Ultrafast Imaging, Hamburg, Germany 10.03-12.03.2014, Three Lectures " *Ultracold physics in low dimensions*"
- Summer school "Low-Dimensional Quantum Many-Body Systems", Trier, Germany, 07.08.2012, Two Lectures " *Tunable quantum gases in one-dimensional confinement*"

Scientific Community Service and Public Outreach

2013 Local Co-organizer of the "International Conference on Quantum Optics 2014" conference in Obergurgl
2012 Organizer of the "Ultracold quantum gases"-group contribution to the "Aktionstag Junge Uni"
2011 Local Co-organizer of the "Frontiers of Matter Wave Optics 2011" conference in Obergurgl as part of the EuroQUASAR program of the European Science Foundation

Awards and Prices

- 2012: "Anerkennungspreis der Jury des Award of Excellence des Bundesministers für Wissenschaft und Forschung"
- 2006: "Undergraduate Research Experience & Knowledge Award from the Science Foundation Ireland"

Working experience and education

- 2005-2006 System administrator for linux-based Internet- and Database servers at IP Management GmbH (part-time).
- 1998-2002 Lead Consultant at the Telecommunication Consultancy "TiKOM Tirol Kommunikation" in Innsbruck and Vienna.
- 1992-1997 "Höhere Technische Bundeslehranstalt für Elektronik/Nachrichtentechnik" in Innsbruck, Matura/A-levels with distinction.

Invited scientific talks

- Conference "Joint Annual Meeting of the Austrian Physical Society and the Swiss Physical Society", Linz, 05.09.2013, Talk "*Doublet stability and decay mechanisms*"
- FINES conference "Finite-Temperature Non-Equilibrium Superfluid Systems", Queenstown, 18.02.2013, Talk "*Quench dynamics in strongly interacting Bose-Hubbard chains*"
- Seminar "Quo vadis BEC", Bad Honnef, 22.08.2012, Talk "*Ultracold atoms with tunable interactions in optical lattice potentials*"
- Workshop "Effective Gravity in Fluids and Superfluids", Trieste, 13.07.2012, Talk "*A metastable Mott insulator state with strong attractive interactions*"
- Maria-Waldrast-Meeting, Maria Waldrast, 02.03.2012, Talk "*Experiments with tunable bosonic quantum gases in optical lattices*"
- SFB-Meeting, Innsbruck, 13.10.2011, Talk "*Multi-body interactions in a Mott-insulator state*"
- Workshop "Quantum transport in dilute gases", Benasque, 14.07.2011, Talk "*Inducing transport with super Bloch oscillations. Beyond the standard Bose Hubbard model*"
- 19th International Laser Physics Workshop, Foz do Iguacu, 06.07.2010, Talk "*Phases, transport, and scattering in low-dimensional quantum systems*"
- ESF Conference "Frontiers of Matter wave optics", Crete, 09.04.2010, Talk "*Rovibronic ground state molecules in an optical lattice*"

Scientific publications (in chronological order)

Observation of Density-Induced Tunneling

O. Jürgensen, F. Meinert, M. J. Mark, H.-C. Nägerl, D.-S. Lühmann
arXiv:1407.0835

Observation of many-body dynamics in long-range tunneling after a quantum quench

F. Meinert, M. J. Mark, E. Kirilov, K. Lauber, P. Weinmann, M. Gröbner, A. J. Daley, and H.-C. Nägerl,
Science **344**, 1259-1262 (2014)

Interaction-Induced Quantum Phase Revivals and Evidence for the Transition to the Quantum Chaotic Regime in 1D Atomic Bloch Oscillations

F. Meinert, M. J. Mark, E. Kirilov, K. Lauber, P. Weinmann, M. Gröbner, and H.-C. Nägerl, Phys. Rev. Lett. **112**, 193003 (2014)

Quantum Quench in an Atomic One-Dimensional Ising Chain

F. Meinert, M. J. Mark, E. Kirilov, K. Lauber, P. Weinmann, A. J. Daley, and H.-C. Nägerl, Phys. Rev. Lett. **111**, 053003 (2013)

Preparation and spectroscopy of a metastable Mott insulator state with attractive interactions

M. J. Mark, E. Haller, K. Lauber, J. G. Danzl, A. Janisch, H. P. Büchler, A. J. Daley, and H.-C. Nägerl, Phys. Rev. Lett. **108**, 215302 (2012)

Three-body correlation functions and recombination rates for bosons in three and one dimensions.

E. Haller, M. Rabie, M. J. Mark, J. G. Danzl, R. Hart, K. Lauber, G. Pupillo, H.-C. Nägerl Phys. Rev. Lett. **107**, 230404 (2011)

Precision Measurements on a Tunable Mott Insulator of Ultracold Atoms

M. J. Mark, E. Haller, K. Lauber, J. G. Danzl, A. J. Daley, H.-C. Nägerl, Phys. Rev. Lett. **107**, 175301 (2011)

Demonstration of the temporal matter-wave Talbot effect for trapped matter waves

M. J. Mark, E. Haller, J. G. Danzl, K. Lauber, M. Gustavsson, H.-C. Nägerl New J. Phys. **13**, 085008 (2011)

Optimal trapping wavelengths of Cs₂ molecules in an optical lattice.

R. Vexiau, N. Bouloufa, M. Aymar, J. G. Danzl, M. J. Mark, H.-C. Nägerl, O. Dulieu Eur. Phys. J. D **65**, 243 (2011)

Ultracold and dense samples of ground-state molecules in lattice potentials.

H.-C. Nägerl, M. J. Mark, E. Haller, M. Gustavsson, R. Hart, J. G. Danzl J. Phys.: Conf. Ser. **264**, 012015 (2011)

Production of a quantum gas of rovibronic ground-state molecules in an optical lattice.

J. G. Danzl, M. J. Mark, E. Haller, G. Gustavsson, R. Hart, H.-C. Nägerl, Laser Spectroscopy **256** (2010)

Pinning quantum phase transition for a Luttinger liquid of strongly interacting bosons

E. Haller, R. Hart, M. J. Mark, J.G. Danzl, L. Reichsöllner, M. Gustavsson, M. Dalmonte, G. Pupillo, H.-C. Nägerl, Nature **66**, 597 (2010)

Interference of interacting matter waves

M. Gustavsson, E. Haller, M. J. Mark, J. G. Danzl, R. Hart, A. J. Daley, H.-C. Nägerl, New J. Phys. **12**, 065029 (2010)

Inducing Transport in a Dissipation-Free Lattice with Super Bloch Oscillations

E. Haller, R. Hart, M. J. Mark, J. G. Danzl, L. Reichsöllner, H. -C. Nägerl,
Phys. Rev. Lett. **104**, 200403 (2010)

Confinement-Induced Resonances in Low-Dimensional Quantum Systems

E. Haller, M. J. Mark, R. Hart, J. G. Danzl, L. Reichsöllner, V. Melezhik, P. Schmelcher, H. -
C. Nägerl,
Phys. Rev. Lett. **104**, 153203 (2010)

An ultracold high-density sample of rovibronic ground-state molecules in an optical lattice

J. G. Danzl, M. J. Mark, E. Haller, M. Gustavsson, R. Hart, J. Aldegunde, J. M. Hutson, H. -
C. Nägerl,
Nature Physics **6**, 265 (2010)

Realization of an Excited, Strongly Correlated Quantum Gas Phase

E. Haller, M. Gustavsson, M. J. Mark, J. G. Danzl, R. Hart, G. Pupillo, H. -C. Nägerl,
Science **325**, 1224 (2009)

Deeply bound ultracold molecules in an optical lattice

J. G. Danzl, M. J. Mark, E. Haller, M. Gustavsson, R. Hart, A. Liem, H. Zellmer, H.-C.
Nägerl,
New J. Phys. **11**, 055036 (2009)

Precision molecular spectroscopy for ground state transfer of molecular quantum gases

J. G. Danzl, M. J. Mark, E. Haller, M. Gustavsson, N. Bouloufa, O. Dulieu, H. Ritsch, R.
Hart, H.-C. Nägerl,
Faraday Discuss. (2009) DOI: 10.1039/B820542F

Dark resonances for ground state transfer of molecular quantum gases

M. J. Mark, J. G. Danzl, E. Haller, M. Gustavsson, N. Bouloufa, O. Dulieu, H. Salami, T.
Bergeman, H. Ritsch, R. Hart and H.-C. Nägerl,
Appl. Phys. B **95**, 219-225 (2009)

Quantum Gas of Deeply Bound Ground State Molecules

J. G. Danzl, E. Haller, M. Gustavsson, M. J. Mark, R. Hart, N. Bouloufa, O. Dulieu, H.
Ritsch, H.-C. Nägerl,
Science **321**, 1062 (2008)

Control of Interaction-Induced Dephasing of Bloch Oscillations

M. Gustavsson, E. Haller, M. J. Mark, J. G. Danzl, G. Rojas-Kopeinig, H.-C. Nägerl,
Phys. Rev. Lett. **100**, 080404 (2008)