

Univ. Prof. Dr. Markus Arndt

Personal Information

Birth	14.09.1965, Unkel/Rh. (Germany)
Nationality	Germany
Marital status	Married, 2 children
Address	University of Vienna, Faculty of Physics, Boltzmanngasse 5, A-1090 Vienna
WWW	www.quantumnano.at
EMAIL	markus.arndt@univie.ac.at
ORCID	0000-0002-9487-4985

Career development

since 2008	Full Professor of Quantum Nanophysics at University of Vienna,
2004 - 2008	Professor of Quantum Nanophysics at University of Vienna,
2002	Docent / Ao. Univ. Prof. at University of Vienna (Habilitation)
1999 - 2002	Universitätsassistent at University of Vienna, with Anton Zeilinger.
1997 - 1998	Postdoc at University of Innsbruck, with Anton Zeilinger.
1995 - 1997	Postdoc at Ecole Normale Supérieure, Paris with Jean Dalibard
1994 - 1995	Postdoc at MPQ, Garching, with A. R. Weis and T. W. Hänsch
1991 - 1994	PhD (LMU, Munich) at MPQ, Garching: with A. R. Weis and T. W. Hänsch
1990 - 1991	Diploma Work at LMU Munich, with Herbert Walther

Professional activities

07/2020 – 9/2026	Scientific Director & V-DSPL, Vienna Doctoral School in Physics
10/2018 – 9/2022	Vice Dean, Faculty of Physics, University of Vienna
01/2020-12/2022	Coordinator, EU FET Open <i>SuperMaMa</i>
Since 9/2016	Speaker, Erwin Schrödinger Center for Quantum Science & Technology ESQ Austria
03/2016 – 06/2020	Speaker, Vienna Doctoral School in Physics
03/2013 – 02/2016	Coordinator, EU FET Open <i>NANOQUESTFIT</i>
2013 - 2015	PI & Founding member, Research Platform <i>QuNaBioS</i>
10/2012 – 09/2014	Dean, Faculty of Physics, University of Vienna
01/2007 – 09/2012	Speaker, Quantum optics, Q-nanophysics and Q-information
2006 - 2013	Speaker, Vienna FWF Graduate Program Complex Quantum Systems
2007 - 2011	Coordinator, ESF network: Molecule Interferometry & Metrology <i>MIME</i>
2008 - 2013	Member, Steering Committee to the ESF Network <i>Casimir</i>

Awards, Distinctions & Research Prizes

2020	Schrödinger Prize of the Austrian Academy of Sciences, ÖAW, with L. Erdős
2019	Robert-Wichard-Pohl Prize, German Physical Society, DPG
2018	Fetzer Pioneer Award, Fetzer Foundation
2014	Outstanding Referee for the journals of the American Physical Society (APS)
2013	Prize for Natural and Technical Sciences, City of Vienna
2012	ERC Advanced Grant, European Research Council
2008	Wittgenstein Prize, Ministry for Science and Research, BMWF & FWF
2006	Science Communication Award (3 rd), Austrian Science Fund, FWF
2001	START Prize, Ministry of Education, Science & Culture & FWF
2000	Fritz-Kohlrausch Prize, Austrian Physical Society, ÖPG
2000	Erich-Schmid-Prize, Austrian Acad. of Sciences, ÖAW, with G. Springholz

5 Distinguished fellowships and memberships

Since 2022	Member of the European Academy of Sciences and Arts
Since 2014	Corresponding Member, Austrian Academy of Sciences (ÖAW)
2008-2013	Member Young Curia, Austrian Academy of Sciences (ÖAW)
1996-1997	DFG research fellowship
1995-1996	Feodor-Lynen fellowship, Alexander von Humboldt foundation
1986-1991	Fellowship, Studienstiftung des deutschen Volkes

Research Interests

- **Universal matter-wave interferometry**
with atoms, clusters, tailored molecules, biomolecules and nanoparticles.
- **Quantum physics at the interface to the classical world:**
decoherence and interferometric tests of wave function collapse.
- **Quantum physics at the interface to chemistry:**
Quantum nanorulers to measure electric, magnetic, optical and structural properties of molecules.
- **Quantum physics at the interface to biology:**
Matter-wave experiments with vitamins, antibiotics and polypeptides.
- **Quantum physics at the interface to mass spectrometry technologies**
Quantum nanowire detectors for biomolecular beams
- **Quantum physics at the interface to optomechanics:**
Cooling of massive nanorotors to their librational quantum ground state.

A) Publications listed in the Science Citation Index

1. J. Klimesch, S. Arlt, C. Ruiz-Gonzalez, C. Rodríguez, X. Gu, P. Haslinger, P. Vischia, C. Haack, Y. Drori, R. Adhikari, M. Arndt, M. Kagan, L. Heinrich, M. Krenn,
Designing physics experiments with artificial intelligence,
Nature **657**, **47** (2026); DOI: 10.1038/s41586-026-10898-6
2. M. Strauss, Y. Hua, M. Pfeffer, A. Di Silvestro, P. Geyer, M. Mayor, M. Arndt and V. Köhler
UV photo-uncaging of Ru(II)-polypyridyl bioconjugates in high vacuum
Phys. Chem. Chem. Phys. **28**, 16929–16936 (2026), DOI: 10.1039/D6CP00849F
3. S. Pedalino, B. E. Ramírez-Galindo, R. Ferstl, S. Sindelar, S. Gerlich, M. Arndt
Cluster Science and the Foundations of Quantum Mechanics.
in: Perspectives for Cluster Science
Eur. Phys. J. D **80**, 50 (2026), DOI: 10.1140/epjd/s10053-026-01126-x
4. S. Troyer, F. Fechtel, L. Hummer, H. Rudolph, B. A. Stickler, U. Delić and M. Arndt
Quantum ground-state cooling of two librational modes of a nanorotor
Nature Physics **22**, **584 - 590** (2026), DOI:10.1038/s41567-026-03219-1
5. S. Pedalino, R. Ferstl, B. E. Ramírez-Galindo, S. Sindelar, S. Gerlich and M. Arndt
de Broglie and moiré metrology: From atoms to massive metal clusters
AVS Quantum Sci. **8**, 013201, (2026), DOI: 10.1116/5.0301389
Scilight: 10.1063/10.0042205
6. S. Pedalino, B. E. Ramírez-Galindo, R. Ferstl, K. Hornberger, M. Arndt and S. Gerlich
Probing quantum mechanics with nanoparticle matter-wave interferometry
Nature **649**, **866-870** (2026), DOI: 10.1038/s41586-025-09917-9
Nature Podcast: <https://www.nature.com/articles/d41586-026-00227-2>
7. O. Rybakova, J. Reisinger, P. Rieser, P. Geyer, S. Gerlich, M. Arndt, A. Kumar, D. Häussinger, M. Mayor and V. Köhler
Photocleavable Porphyrin Derivatives for Quantum Optics
Helv. Chim. Acta e202500022 (2025), DOI: 10.1002/hlca.202500022
8. Y. Hua, D. Häussinger, M. Mayor, V. Köhler, M. Strauss, M. F. X. Mauser, T. Kistersitz, P. Geyer, M. Arndt
Neutralization of an Oxytocin Derivative by 355 nm Photocleavage in High Vacuum
Helv. Chim. Acta e202400167 (2025), DOI: 10.1002/hlca.202400167
9. L. Martinetz, B. A. Stickler, K. Simonović, R. Ferstl, C. Brand, M. Arndt, and K. Hornberger
Probing molecular photophysics in a matter-wave interferometer
Phys. Rev. Research **6**, 043270 (2024), DOI: 10.1103/PhysRevResearch.6.043270
10. M. Strauß, R. Gourgues, M. F. X. Mauser, L. Kulman, M. Castaneda, A. Fognini, A. Shayeghi, P. Geyer, M. Arndt
Superconducting Nanowire Detection of Neutral Atoms and Molecules via Their Internal and Kinetic Energy in the eV Range
Adv. Phys. Res. **4**, 2400133 (2024), DOI: 10.1002/apxr.202400133

Adv. Phys. Res. Inside Front Cover & Featured as a recommended article

11. K. Simonović, R. Ferstl, A. Di Silvestro, M. Mayor, L. Martinetz, K. Hornberger, B. A. Stickler, C. Brand and M. Arndt
Diffraction of molecular matter-waves at deep-ultraviolet standing-light waves
Phys. Chem. Chem. Phys. 26, 27617–27623 (2024), DOI: 10.1039/D4CP03059A
12. P. Rieser, N. Rahaman, F. Donnerbauer, S. Putz, A. Shayeghi, S. Troyer, M. Arndt
An on-demand source of nanoparticles for optomechanics
Appl. Phys. Lett. 125, 094101 (2024), DOI: 10.1063/5.0221965
13. K. Simonović, R. Ferstl, A. Barlow, A. Shayeghi, C. Brand, M. Arndt
Diffraction of polar molecules at nanomasks with low charge density
Phys. Rev. Research 6, 033109 (2024), DOI: 10.1103/PhysRevResearch.6.033109
14. F. Suzuki, S. A. Shah, D. A. R. Dalvit, and M. Arndt
Requirements for probing chiral Casimir-Polder forces in a molecular Talbot-Lau interferometer
Phys. Rev. Research 6, 023145 (2024), DOI: 10.1103/PhysRevResearch.6.023145
15. M. Strauß, A. Shayeghi, M. Mauser, P. Geyer, T. Kistersitz, J. Salapa, O. Dobrovolskiy, S. Daly, J. Commandeur, Y. Hua, V. Köhler, M. Mayor, J. Benserhir, C. Bruschini, E. Charbon, M. Castaneda, M. Gevers, R. Gourgues, N. Kalhor, A. Fognini and M. Arndt
Highly sensitive single-molecule detection of macromolecule ion beams
Science Adv. 9, 48, (2023), DOI: 10.1126/sciadv.adj2801
16. C. Brand, C. Knobloch, K. Simonović, and M. Arndt
Multi-Watt cavity for 266nm light in vacuum
Phys. Scr. 98, 085521 (2023), DOI: 10.1088/1402-4896/ace300
17. Y. Hua, M. Strauss, S. Fisher, M. F. X. Mauser, P. Manchet, M. Smacchia, P. Geyer, A. Shayeghi, M. Pfeffer, T. H. Eggenweiler, S. Daly, J. Commandeur, M. Mayor, M. Arndt, T. Šolomek, V. Köhler
Giving the green light to photochemical uncaging of large biomolecules in high vacuum
JACS Au 3, 2790–2799 (2023), DOI: 10.1021/jacsau.3c00351
18. V. M. Bevez, M. Yu. Mikhailov, B. Budinská, S. Lamb-Camarena, S. O. Shpilinska, A. V. Chumak, M. Urbánek, M. Arndt, W. Lang, and O. V. Dobrovolskiy
Vortex counting and velocimetry for slitted superconducting thin strips
Phys. Rev. Applied 19, 034098 (2023), DOI: 10.1103/PhysRevApplied.19.034098
19. R. Kaltenbaeck, M. Arndt, M. Aspelmeyer, P. F. Barker, A. Bassi, J. Bateman, A. Belenchia, J. Bergé, C. Braxmeier, S. Bose, B. Christophe, G.D. Cole, C. Curceanu, A. Datta, M. Debiossac, U. Delic, L. Diósi, A. A. Geraci, S. Gerlich, C. Guerlin, G. Hechenblaikner, A. Heidmann, S. Hermann, K. Hornberger, U. Johann, N. Kiesel, C. Lämmerzahl, T. W. LeBrun, G.J. Milburn, J. Millen, M. Mohageg, D.C. Moore, G.W. Morley, S. Nimmrichter, L. Novotny, D.K.L. Oi, M. Paternostro, C.J. Riedel, M. Rodrigues, L. Rondin, A. Roura, W.P. Schleich, T. Schuldt, B.A. Stickler, H. Ulbricht, C. Vogt, and L. Wörner
Research campaign: Macroscopic quantum resonators (MAQRO)
Quantum Sci. Technol. 8, 014006 (2023), DOI: 10.1088/2058-9565/aca3cd

20. Y.Y. Fein, S. Pedalino, A. Shayeghi, F. Kiałka, S. Gerlich, and M. Arndt
Nanoscale magnetism probed in a matter-wave interferometer
Phys. Rev. Lett. **129**, 123001 (2022), DOI: 10.1103/PhysRevLett.129.123001
Editor's choice & Editor's pick & Featured in "Physics": <https://physics.aps.org/articles/v15/137>
21. S. Pedalino, T. de Sousa, Y.Y. Fein, S. Gerlich, and M. Arndt
Exploring metal nanoparticles for matter-wave interferometry
Phys. Rev. A **106**, 023312 (2022), DOI: 10.1103/PhysRevA.106.023312
22. *A roadmap for universal high-mass matter-wave interferometry*
F. Kialka, Y. Y. Fein, S. Pedalino, S. Gerlich, and M. Arndt
AVS Quantum Sci. **4**, 020502 (2022), DOI: 10.1116/5.0080940
Scilight: DOI: [10.1063.10.0010425](https://doi.org/10.1063.10.0010425)
23. High finesse microcavities in the optical telecom O-band
J. Fait, S. Putz, G. Wachter, J. Schalko, U. Schmid, M. Arndt, and M. Trupke
Appl. Phys. Lett. **119**, 221112 (2021), DOI: 10.1063/5.0066620
24. *Single-, double-, and triple-slit diffraction of molecular matter-waves*
C. Brand, S. Troyer, C. Knobloch, O. Cheshnovsky, and M. Arndt
Am. J. Phys. **89**, 1132 (2021), DOI: 10.1119/5.0058805
[Am. J. Phys. Cover Page & Editor's Pick](#)
25. W. C.-W. Huang, H. Batelaan, M. Arndt
Kapitza-Dirac Blockade: A Universal Tool for the Deterministic Preparation of Non-Gaussian Oscillator States
Phys. Rev. Lett. **126**, 253601 (2021), DOI: 10.1103/PhysRevLett.126.253601
[Phys. Rev. Lett. Cover Page](#)
26. C. Brand, M. R. A. Monazam, C. Mangler, Y. Lilach, O. Cheshnovsky, M. Arndt, J. Kotakoski
The morphology of doubly-clamped graphene nanoribbons
2D Materials **8**, 025035 (2021), DOI: 10.1088/2053-1583/abe952
27. C. Brand, F. Kialka, S. Troyer, C. Knobloch, K. Simonovic, B.A. Stickler, K. Hornberger, M. Arndt,
Bragg diffraction of large organic molecules
Phys. Rev. Lett. **125**, 033604 (2020), DOI: 10.1103/PhysRevLett.125.033604
[Editor's Suggestion](#)
28. Y.Y. Fein, A. Shayeghi, F. Kialka, P. Geyer, S. Gerlich, M. Arndt,
Quantum-assisted diamagnetic deflection of molecules
Phys. Chem. Chem. Phys. **22**, 14036–14041 (2020), DOI: 10.1039/d0cp02211j
[PCCP Hot Paper](#)
29. J. Schätti, V. Köhler, M. Mayor, Y.Y. Fein, P. Geyer, L. Mairhofer, S. Gerlich, M. Arndt,
Matter-wave interference and deflection of tripeptides decorated with fluorinated alkyl chains
J. Mass Spectrom. **55**, e4514 (2020), DOI:10.1002/jms.4514

30. A. Shayeghi, P. Rieser, G. Richter, U. Sezer, J.H. Rodewald, P. Geyer, T.J. Martinez, M. Arndt, *Matter-wave interference of a native polypeptide*
Nature Commun. **11**, **144** (2020), DOI: 10.1038/s41467-020-15280-2
31. C. Brand, K. Simonovic, F. Kialka, S. Troyer, P., Geyer, M. Arndt, *A fiber-based beam profiler for high-power laser beams in confined spaces and ultra-high vacuum*
Opt. Expr. 28, 6164-6171 (2020), DOI: 10.1364/OE.387650
32. Y. Y. Fein, F. Kialka, P. Geyer, S. Gerlich, M. Arndt, *Coriolis compensation via gravity in a matter-wave interferometer*
New J. Phys. 22, 033013 (2020), DOI:10.1088/1367-2630/ab73c5
33. Y. Y. Fein, A. Shayeghi, L. Mairhofer, F. Kialka, P. Rieser, P. Geyer, S. Gerlich, M. Arndt, *Quantum-Assisted Measurement of Atomic Diamagnetism*
Phys. Rev. X **10**, **011014** (2020), DOI: 10.1103/PhysRevX.10.011014
34. Y. Y. Fein, P. Geyer, F. Kialka, S. Gerlich, M. Arndt, *Improved accuracy fullerene polarizability measurements in a long-baseline matter-wave interferometer*
Phys. Rev. Res. 1, 033158 (2019), DOI: 10.1103/PhysRevResearch.1.033158
35. Y. Y. Fein, P. Greyer, P. Zwick, F. Kialka, S. Pedalino, M. Mayor, S. Gerlich and M. Arndt, *Quantum Superposition of Molecules Beyond 25 kDa*,
Nature Phys. **15**, **1242–1245** (2019), DOI:10.1038/s41567-019-0663-9
Highlighted by more than 40 News Outlets, such as Spiegel, NZZ, FAZ, Spektrum, APA, etc..
36. J. Schätti, M. Kriegleder, M. Debiossac, M. Kerschbaum, P. Geyer, M. Mayor, M. Arndt, V. Köhler, *Neutralization of insulin by photocleavage under high vacuum*,
Chem. Commun. **55**, **12507–12510** (2019), DOI: 10.1039/c9cc05712a
37. G. Wachter, S. Kuhn, S. Minniberger, C. Salter, P. Asenbaum, J. Millen, M. Schneider, J. Schalko, U. Schmid, A. Felgner, D. Hüser, M. Arndt, M. Trupke, *Silicon microcavity arrays with open access and a finesse of half a million*,
Light: Science & Applications 8, 1-7 (2019), DOI: 10.1038/s41377-019-0145-y
38. C. Brand, M. Debiossac, T. Susi, F. Aguillon, J. Kotakoski, P. Roncin, M. Arndt *Coherent diffraction of hydrogen through the 246 pm lattice of graphene*
New J. Phys. 21, 033004 (2019), DOI: 10.1088/1367-2630/ab05ed
39. F. Kialka, B. Stickler, K. Hornberger, Y.Y. Fein, P. Geyer, L. Mairhofer, S. Gerlich, M. Arndt, *Concepts for long-baseline high-mass matter-wave interferometry*
Phys. Scr. 94, 034001 (2019), DOI: 10.1088/1402-4896/aaf243
40. J. Schätti, P. Rieser, U. Sezer, G. Richter, P. Geyer, G. G. Rondina, D. Häussinger, M. Mayor, A. Shayeghi, V. Köhler, M. Arndt *Pushing the mass limit for intact launch and photoionization of large neutral biopolymers*
Commun. Chem. 1, 93 (2018), DOI: 10.1038/s42004-018-0095-y

41. B. A. Stickler, B. Papendell, S. Kuhn, B. Schirnski, J. Millen, M. Arndt, K. Hornberger
Probing macroscopic quantum superpositions with nanorotors
New J. Phys. 20, 122001 (2018), DOI: 10.1088/1367-2630/aaec4
42. C. Brand, B.A. Stickler, C. Knobloch, A. Shayeghi, K. Hornberger and M. Arndt
Conformer-selection by matter-wave interference
Phys. Rev. Lett. **121**, 173002 (2018), DOI: 10.1103/PhysRevLett.121.173002
43. L. Mairhofer, S. Eibenberger, A. Shayeghi and M. Arndt
A quantum ruler for magnetic deflectometry
Entropy 20, 516 (2018), DOI: 10.3390/e20070516
44. M. Debiossac, J. Schätti, M. Kriegleder, P. Geyer, A. Shayeghi, M. Mayor, M. Arndt. and V. Köhler
Tailored photocleavable peptides: Fragmentation and neutralization pathways in high vacuum
Phys. Chem. Chem. Phys. 20, 11412-11417 (2018), DOI: 10.1039/c8cp01058g
45. J. Rodewald, N. Dörre, A. Grimaldi, P. Geyer, L. Felix, M. Mayor, A. Shayeghi and M. Arndt
Isotope-selective high-order interferometry with large organic molecules in free fall
New J. Phys. 20, 033016 (2018), DOI: 10.1088/1367-2630/aaade2
46. S. Kuhn, G. Wachter, F. Wieser, J. Millen, M. Schneider, J. Schalko, U. Schmid,
M. Trupke and M. Arndt
Nanoparticle detection in an open-access silicon microcavity
Appl. Phys. Lett. 111, 253107 (2017), DOI: 10.1063/1.5008492
[Editor's Pick](#)
47. S. Kuhn, B. A. Stickler, A. Kosloff, F. Patolsky, K. Hornberger, M. Arndt and J. Millen
Optically driven ultra-stable nanomechanical rotor
Nature Comm. **8**, 1670 (2017), DOI: 10.1038/s41467-017-01902-9
[Highlighted by Phys Org](#)
48. J. P. Cotter, C. Brand, C. Knobloch, Y. Lilach, O. Cheshnovsky and M. Arndt
In search of multipath interference using large molecules
Science Adv. **3**, e1602478 (2017), DOI: 10.1126/sciadv.1602478
[Highlighted in Physics World, Phys Org](#)
49. L. Mairhofer, S. Eibenberger, J. P. Cotter, M. Romirer, A. Shayeghi and M. Arndt
Quantum-assisted metrology of neutral vitamins in the gas-phase
Angew. Chem. Int. Ed. **56**, 6 (2017), DOI: 10.1002/ange.201704916
Angew. Chem. **129**, 7 (2017), DOI: 10.1002/ange.201704916
[Highlighted in Chemistry Views, Health Medici Net, Pro Physik](#)
50. L. Gallego, U. Sezer, M. Arndt and M. Mayor
Long-pulse laser launch and ionization of tailored large neutral silver nanoparticles with atomic mass assignment
Nanoscale 9, 9175-9180 (2017); DOI: 10.1039/c7nr03297n
51. J. Schätti, U. Sezer, S. Pedalino, J. P. Cotter, M. Arndt*, M. Mayor and V. Köhler*
Tailoring the volatility and stability of oligopeptides

- J. Mass Spectrom. 52, 550-556 (2017), DOI: 10.1002/jms.3959
52. J. Rodewald, P. Haslinger, N. Dörre, B.A. Stickler, A. Shayeghi, K. Hornberger and M. Arndt
New avenues for matter-wave-enhanced spectroscopy,
Appl. Phys. B 123, 3 (2017), DOI: 10.1007/s00340-016-6573-y
 53. U. Sezer, P. Geyer, M. Kriegleder, M. Debiossac, A. Shayeghi, M. Arndt, F. Lukas and M. Mayor
Selective photodissociation of tailored molecular tags as a tool for quantum optics,
Beilstein J. Nanotechnol. 8, 325-333 (2017), DOI: 10.3762/bjnano.8.35
 54. S. Kuhn, A. Kosloff, B. A. Stickler, F. Patolsky, K. Hornberger, M. Arndt, and J. Millen
Full Rotational Control of Levitated Silicon Nanorods
Optica 4, 356-360 (2017), DOI: doi.org/10.1364/OPTICA.4.000356
 55. C. Knobloch, B. A. Stickler, C. Brand, M. Sclafani, Y. Lilach, T. Juffmann, O. Cheshnovsky, K. Hornberger and M. Arndt
On the role of the electric dipole moment in the diffraction of biomolecules at nanomechanical gratings
Prog. Phys. 65, 1600025 (2016). DOI: 10.1002/prop.201600025
 56. B. A. Stickler, S. Nimmrichter, L. Martinetz, S. Kuhn, M. Arndt and K. Hornberger
Ro-Translational Cavity Cooling of Dielectric Rods and Disks
Phys. Rev. A 94, 033818 (2016), DOI: 10.1103/PhysRevA.94.033818
 57. P. Geyer, U. Sezer, J. Rodewald, L. Mairhofer, N. Dörre, P. Haslinger, S. Eibenberger, C. Brand and M. Arndt
Perspectives for Quantum Interference with Biomolecules and Biomolecular Clusters
Phys. Scr. 91, 063007-063019 (2016), DOI: 10.1088/0031-8949/91/6/063007
 58. W.P. Schleich, et al.
Quantum technology: from research to application
Appl. Phys. B 122, 1-31 (2016), DOI: 10.1007/s00340-016-6353-8
 59. C. Brand, M. Sclafani, C. Knobloch, Y. Lilach, T. Juffmann, J. Kotakoski, C. Mangler, A. Winter, A. Turchanin, J. Meyer, O. Cheshnovsky and M. Arndt
An atomically thin matter-wave beam splitter
Nature Nanotechn. 10, 845 - 848 (2015), DOI: 10.1038/nnano.2015.179
[Nature Nano: News & Views by P. Treutlein](#)
[Highlighted by Physics World](#)
 60. Markus Arndt and Christian Brand,
Interference of atomic clocks,
Science 349, 1168 - 1169 (2015), DOI: 10.1126/science.aad0683
 61. C. Brand, J. Fiedler, T. Juffmann, M. Sclafani, C. Knobloch, S. Scheel, Y. Lilach, O. Cheshnovsky and M. Arndt,
A Green's function approach to modeling molecular diffraction in the limit of ultra-thin gratings
Ann. Phys. 527, 580 - 591 (2015), DOI: 10.1002/andp.201500214

62. M. Tomandl, T. Mieling, C. Losert-Valiente Kroon, M. Hopf and M. Arndt
Simulated Interactive Research Experiments as Educational Tools for Advanced Science
Sci. Rep. 5, 14108 (2015), DOI: 10.1038/srep14108
[Highlighted by Phys.org, Physics News ...](#)
63. S. Kuhn, P. Asenbaum, A. Kosloff, M. Sclafani, B. A. Stickler, S. Nimmrichter, K. Hornberger, O. Cheshnovsky, F. Patolsky and M. Arndt
Cavity-assisted manipulation of freely rotating silicon nanorods in high vacuum
Nano Letters 15, 5604 - 5608 (2015), DOI: 10.1021/acs.nanolett.5b02302
64. J. Kotakoski, C. Brand, Y. Lilach, O. Cheshnovsky, C. Mangler, M. Arndt and J. C. Meyer
Towards two-dimensional all-carbon heterostructures via ion beam patterning of single-layer graphene
Nano Letters 15, 5944 - 5949 (2015), DOI: 10.1021/acs.nanolett.5b02063
65. J. P. Cotter, S. Eibenberger, L. Mairhofer, X. Cheng, P. Asenbaum, M. Arndt;
K. Walter, S. Nimmrichter and K. Hornberger
Coherence in the presence of absorption and heating in a molecule interferometer
Nature Commun. 6, 7336 (2015), DOI: 10.1038/ncomms8336
66. U. Sezer, L. Wörner, J. Horak, L. Felix, J. Tüxen, C. Götz, A. Vaziri, M. Mayor and M. Arndt
Laser-induced acoustic desorption of natural and functionalized biochromophores
Anal. Chem. 87, 5614–5619 (2015), DOI: 10.1021/acs.analchem.5b00601
67. U. Sezer, P. Schmid, L. Felix, M. Mayor and M. Arndt
Stability of high-mass molecular libraries: the role of the oligoporphyrin core
J. Mass Spectrom. 50, 235-239 (2015), DOI: 10.1002/jms.3526
68. J. Espigulé-Pons, C. Götz, A. Vaziri and M. Arndt
Physical Constraints for the Stoneham Model for Light-Dependent Magnetoreception
arXiv:1412.7369 (2014)
69. N. Dörre, P. Haslinger, J. Rodewald, P. Geyer and M. Arndt,
A refined model for Talbot-Lau matter-wave optics with pulsed photo-depletion gratings
JOSA B 32, 114–120 (2015), DOI: 10.1364/JOSAB.32.000114
70. N. Dörre, J. Rodewald, P. Geyer, B. von Issendorff, P. Haslinger and M. Arndt
Photofragmentation beam splitters for matter-wave interferometry
Phys. Rev. Lett. 113, 233001 (2014), DOI: 10.1103/PhysRevLett.113.233001
[Editor's Choice & Viewpoint in Physics 7, 122 \(2014\) by Gil Summy](#)
71. C. Emary, J. P. Cotter and M. Arndt
Testing macroscopic realism through high-mass interferometry.
Phys. Rev. A 90, 042114 (2014), DOI: 10.1103/PhysRevA.90.042114
72. L. Felix, U. Sezer, M. Arndt and M. Mayor,
Synthesis of Highly Fluoroalkyl-Functionalized Oligoporphyrin Systems,
Eur. J. Org. Chem. 6884–6895 (2014), DOI: 10.1002/ejoc.201402816

Wiley Hot Topics in Fluorine Chemistry

73. S. Eibenberger, X. Cheng, J. P. Cotter and M. Arndt
Absolute absorption cross sections from photon recoil in a matter-wave interferometer
Phys. Rev. Lett. **112**, 250402 (2014), DOI: 10.1103/PhysRevLett.112.250402
74. M. Arndt
De Broglie's meter stick: Making measurements with matter waves.
Phys. Today **67**, 30-36 (2014), DOI: 10.1063/PT.3.2381
75. M. Arndt and K. Hornberger
Insight review: Testing the limits of quantum mechanical superpositions
Nature Physics **10**, 271 - 277 (2014), DOI: 10.1038/nphys2863
76. M. Tomandl, C. M. Losert-Valiente Kroon, M. Hopf and M. Arndt
Interaktive Forschungssimulationen
Praxis Naturwiss. 8, 31 - 36 (2013)
77. P. Asenbaum, S. Kuhn, S. Nimmrichter, U. Sezer and M. Arndt
Cavity cooling of free silicon nanoparticles in high vacuum
Nature Commun. **4**, 2743 (2013), DOI: 10.1038/ncomms3743
78. T. Juffmann, H. Ulbricht and M. Arndt
Experimental methods of molecular matter-wave optics
Rep. Progr. Phys. **76**, 086402 (2013), DOI: 10.1088/0034-4885/76/8/086402
79. S. Eibenberger, S. Gerlich, M. Arndt, M. Mayor and J. Tüxen,
Matter-wave interference with particles selected from a molecular library with masses exceeding 10 000 amu
Phys. Chem. Chem. Phys. **15**, 14696 (2013), DOI: 10.1039/C3CP51500A
80. M. Sclafani, T. J. Juffmann, C., Knobloch, and M. Arndt
*Quantum coherent propagation of complex molecules through the frustule of the alga *Amphipleura pellucida*,*
New J. Phys. **15**, 083004 (2013), DOI: 10.1088/1367-2630/15/8/083004
[See the Video Abstract featured in Physics World 9/2013](#)
81. P. Schmid, F. Stöhr, M. Arndt, J. Tüxen and M. Mayor
Single-Photon Ionization of Organic Molecules
J. Am. Soc. Mass Spectrom. 24, 602-608 (2013), DOI: 10.1007/s13361-012-0551-3
82. M. Arndt
Viewpoint: Free-Falling Interferometry
Physics 6, 23 (2013), DOI: 10.1103/Physics.6.23
83. P. Haslinger, N. Dörre, P. Geyer, J. Rodewald, S. Nimmrichter and M. Arndt
A universal matter-wave interferometer with optical ionization gratings in the time domain
Nature Physics **9**, 144–148 (2013), DOI: 10.1038/nphys2542
[News & Views, Nature Physics by A. Cronin & W. Holmgren](#)

84. M. Arndt, A. Ekers, W. von Klitzing and H. Ulbricht
Focus on modern frontiers of matter wave optics and interferometry, Editorial
New J. Phys. 14, 125006 (2012), DOI: 10.1088/1367-2630/14/12/125006

85. T. Juffmann, A. Milic, M. Müllneritsch, P. Asenbaum, A. Tsukernik, J. Tüxen, M. Mayor, O. Cheshnovsky and M. Arndt
Real-time single-molecule imaging of quantum interference
Nature Nanotechnology 7, 297 - 300 (2012), DOI:10.1038/nnano.2012.34
[News & Views of Nature Nanotechnology](#), by B. Z. Zhao & W. Schöllkopf
[Cover page of Nature Nanotechnology May 2012](#)
[Chosen 2016 by Nature Nanotechnology to be among the best science pictures in 10 years of the Nature Nanotechnology](#)

86. M. Sclafani, M. Marksteiner, F. McLennan Keir, A. Korneev, A. Semenov, G. Gol'tsman and M. Arndt
Characterization of a superconducting nanowire detector for low energy ions
Nanotechnology 23, 065501 (2012), DOI: 10.1088/0957-4484/23/6/065501
[Featured as IOP Labtalk](#)

87. K. Hornberger, S. Gerlich, S. Nimmrichter, P. Haslinger and M. Arndt
Colloquium: Quantum interference with clusters and molecules
Rev. Mod. Phys. 84, 157-173 (2012), DOI: 10.1103/RevModPhys.84.157
[Highlighted in Nature Physics by M. Buchanan, Feb. 2012](#)

88. T. Juffmann, S. Nimmrichter, M. Arndt, H. Gleiter and K. Hornberger
New prospects for de Broglie interferometry: Grating diffraction in the far-field and Poisson's spot in the near-field
Found. Phys. 42, 98-110 (2012), DOI: 10.1007/s10701-010-920-5

89. P. Asenbaum and M. Arndt
Cavity stabilization using the weak intrinsic birefringence of dielectric mirrors
Opt. Lett. 36, 3720 - 3722 (2011), DOI: 10.1364/OL.36.003720

90. J. Tüxen, S. Eibenberger, S. Gerlich, M. Arndt, M. Mayor
Highly Fluorous Porphyrins as Model Compounds for Molecule Interferometry
Eur. J. Org. Chem. 25, 4823-4833 (2011), DOI: 10.1002/ejoc.201100638
[Featured by Chemistry Views](#)

91. S. Nimmrichter, P. Haslinger, K. Hornberger and M. Arndt
Concept of an ionizing time-domain matter-wave interferometer
New J. Phys. 13, 075002 (2011), DOI: 10.1088/1367-2630/13/7/075002

92. M. Arndt
Coherence from spontaneity
Nature Physics 7, 375-376 (2011), DOI: 10.1038/nphys1987

93. S. Nimmrichter, K. Hornberger, P. Haslinger and M. Arndt
Testing spontaneous localization theories with matter-wave interferometry
 Phys. Rev. A 83, 043621 (2011), DOI: 10.1103/PhysRevA.83.043621
[Featured by British Daily Telegraph Dec. 2012](#)

94. S. Eibenberger, S. Gerlich, M. Arndt, J. Tüxen and M. Mayor
Electric moments in molecule interferometry
 New J. Phys. 13, 043033 (2011), DOI: 10.1088/1367-2630/13/4/043033
[Featured as IOP Select May 2011](#)

95. S. Gerlich, S. Eibenberger, M. Tomandl, S. Nimmrichter, K. Hornberger, P. J. Fagan, J. Tüxen, M. Mayor and M. Arndt,
Quantum interference of large organic molecules
Nature Commun 2, 263 (2011), DOI: 10.1038/ncomms1263
[Highlight and featured by Nature Commun. April 5th 2011](#)
[TOP100 Science Stories in Discover Magazine 2/2012](#)

96. T. Juffmann, S. Nimmrichter, M. Arndt, H. Gleiter and K. Hornberger
New prospects for de Broglie interferometry: Grating diffraction in the far-field and Poisson's spot in the near-field
 Found. Phys. 42, 98 - 110 (2012), DOI: 10.1007/s10701-010-9520-5

97. S. Nimmrichter, K. Hammerer, P. Asenbaum, H. Ritsch and M. Arndt
Master equation for the motion of a polarizable particle in a multimode cavity
 New J. Phys. 12, 083003 (2010); DOI:10.1088/1367-2630/12/8/083003

98. A. Dreas, M. Müllneritsch, T. Juffmann, C. Cioffi, M. Arndt and M. Mayor
Immobilization of Zinc Porphyrin Complexes on Pyridine-Functionalized Glass Surfaces
 Langmuir 26, 10822 - 10826 (2010), DOI:10.1021/la100638u

99. J. Tüxen, S. Gerlich, S. Eibenberger, M. Arndt and M. Mayor
Quantum interference distinguishes between constitutional isomers
 Chem. Commun. 46, 4145 - 4147 (2010), DOI: 10.1039/c0cc00125b

100. M. Gring, S. Gerlich, S. Eibenberger, S. Nimmrichter, T. Berrada, M. Arndt, H. Ulbricht, K. Hornberger, M. Müri, M. Mayor, M. Boeckmann and N. Doltsinis
Influence of conformational molecular dynamics on matter wave interferometry
 Phys. Rev. A 81, 031604(R) (2010), DOI: 10.1103/PhysRevA.81.031604
APS: Selected for the Virtual Journal of Atomic Quantum Fluids 2, Issue 4 (2010)

101. T. Juffmann, S. Truppe, P. Geyer, S. Deachapunya, H. Ulbricht and M. Arndt
Wave and Particle in Molecular Interference Lithography
Phys. Rev. Lett. 103, 263601 (2009), DOI: 10.1103/PhysRevLett.103.263601
[PRL: Editor's Suggestions](#)
APS: Selected for the Virtual Journal of Nanoscale Science & Technology, Vol.11 (2010)
APS: Selected for the Virtual Journal of Atomic Quantum Fluids Vol. 2 (1) (2010)

102. M. Arndt, M. Aspelmeyer and A. Zeilinger
How to extend quantum experiments

Fortschr. Phys. 57, 1153 - 1162 (2009), DOI: 10.1002/prop.200900104

103. M. Arndt, T. Juffmann and V. Vedral
Quantum Physics Meets Biology
HFSP Journal 3, 386-400 (2009), DOI: 10.2976/1.3244985
APS: Selected for the Virtual Journal of Quantum Information January 10 (2010)
APS: Selected for the Virtual Journal of Biological Physics Research January 15, (2010)
104. W. B. Case, M. Tomandl, S. Deachapunya and M. Arndt
Realization of Optical Carpets in the Talbot and Lau Configurations
Opt. Expr. 17, 20966- 20974 (2009), DOI: 10.1364/OE.17.020966
105. M. Marksteiner, A. Divochiy, M. Sclafani, P. Haslinger, H. Ulbricht, Al Korneev, A. Semenov, G. Gol'tsman and M. Arndt
A Superconducting NbN detector for neutral nanoparticles
Nanotechnology 20, 455501 (2009), DOI: 10.1088/0957-4484/20/45/455501
106. M. Marksteiner, P. Haslinger, M. Sclafani, H. Ulbricht and M. Arndt
UV and VUV ionization of organic molecules, clusters and complexes
J. Phys. Chem. A 113, 9952 - 9957 (2009), DOI:10.1021/jp905039f
107. K. Hornberger, S. Gerlich, H. Ulbricht, L. Hackermüller, S. Nimmrichter, I. V. Goldt, O. Boltalina and M. Arndt
Theory and experimental verification of Kapitza-Dirac-Talbot-Lau interferometry
New J. Phys. 11, 043032 (2009), DOI:10.1088/1367-2630/11/4/043032
[IOP select, April 2009](#)
108. Amelino-Camelia et al.
GAUGE: the GrAnd Unification and Gravity Explorer
Exper. Astron. 23, 549 - 572 (2009), DOI: 10.1007/s10686-008-9086-9
109. Ertmer, W. et al.
Matter wave explorer of gravity (MWXG)
Exper. Astron 23, 611 - 649 (2008), DOI: 10.1007/s10686-008-9125-6
110. S. Nimmrichter, K. Hornberger, H. Ulbricht and M. Arndt
Absolute absorption spectroscopy based on molecule interferometry
Phys. Rev. A 78, 063607 (2008), DOI: 10.1103/PhysRevA.78.063607
also "Virtual Journal of Nanoscale Science & Technology"
111. S. Gerlich, M. Gring, H. Ulbricht, K. Hornberger, J. Tüxen, M. Mayor and M. Arndt
Matter-Wave Metrology as a Complementary Tool for Mass Spectrometry
Angew. Chem. Int. Ed. 47, 6195 - 6198, (2008), DOI 10.1002/anie.200801942
Angew. Chem. 120, 6290 - 6293 (2008)
[VIP paper and Cover Page at Angew. Chemie](#)
112. M. Marksteiner, P. Haslinger, H. Ulbricht, M. Sclafani, H. Oberhofer, C. Dellago and M. Arndt
Gas-phase formation of large neutral alkaline-earth metal tryptophan complexes

- J. Am. Soc. Mass. Spectrom. 19, 1021 - 1026 (2008), DOI: 10.1016/j.jasms.2008.04.028
113. A. Stefanov, M. Berninger and M. Arndt
A novel design for electric field deflectometry on extended molecular beams
Meas. Sci. Technol. 19, 055801 (2008), DOI: 10.1088/0957-0233/19/5/055801
114. H. Ulbricht, M. Berninger, S. Deachapunya, A. Stefanov and M. Arndt
Gas phase sorting of fullerenes, polypeptides and carbon nanotubes
Nanotechnology 19, 045502 (2008), DOI: 10.1088/0957-4484/19/04/045502
[Nanotechweb.org labtalk 1/2008](http://Nanotechweb.org/1abtalk/1/2008)
115. S. Deachapunya, P. J. Fagan, A. G. Major, E. Reiger, H. Ritsch, A. Stefanov, H. Ulbricht and M. Arndt
Slow beams of massive molecules
Eur. Phys. J. D 46, 307 (2008), DOI: 10.1140/epjd/e2007-00301-8
116. L. Hackermüller, K. Hornberger, S. Gerlich, M. Gring, H. Ulbricht and M. Arndt
Optical polarizabilities of large molecules measured in near-field interferometry
Appl. Phys. B 89, 469 - 473 (2007), DOI: 10.1007/s00340-007-2873-6
117. S. Gerlich, L. Hackermüller, K. Hornberger, A. Stibor, H. Ulbricht, F. Goldfarb, T. Savas, M. Müri, M. Mayor and M. Arndt
A Kapitza-Dirac-Talbot-Lau interferometer for highly polarizable molecules
Nature Physics 3, 711 (2007), DOI:10.1038/nphys701
[Research highlights by NATURE & NATURE PHYSICS \(8/2007\)](#)
118. M. Berninger, A. Stefanov, S. Deachapunya and M. Arndt
Polarizability measurements in a molecule near-field interferometer
Phys. Rev. A. 76, 013607 (2007), DOI: 10.1103/PhysRevA.76.013607
APS selected: Virtual Journal of Nanoscale Science & Technology, Vol.16No.4 (2007)
119. S. Deachapunya, A. Stefanov, M. Berninger, H. Ulbricht, E. Reiger, N. L. Doltsinis and M. Arndt
Thermal and electrical properties of porphyrin derivatives and their relevance for molecule interferometry
J. Chem. Phys. 126, 164304 (2007), DOI: 10.1063/1.2721563
120. N. Gotsche, H. Ulbricht and M. Arndt
UV-VIS absorption spectroscopy of large molecules for applications in matter wave interferometry
Laser Physics 17, 583 - 589 (2007), DOI: 10.1134/S1054660X07040433
121. E. Reiger, L. Hackermüller, M. Berninger and M. Arndt
Exploration of gold nanoparticle beams for matter wave interferometry
Opt. Comm. 264, 326-332 (2006), DOI:10.1016/j.optcom.2006.02.060
122. M. Marksteiner, G. Kiesewetter, L. Hackermüller, H. Ulbricht and M. Arndt
Cold Beams of Biomolecules for Quantum Optics
Acta Phys. Hung. A 26, 87 - 94 (2006), DOI: 10.1556/APH.26.2006.1-2.12

123. M. Arndt
Quantum physics - Coherence in molecular nitrogen
Nature Physics 1, 19-20 (2005), DOI: 10.1038/nphys118
124. A. Stibor, André Stefanov, Fabienne Goldfarb, Elisabeth Reiger and Markus Arndt
A scalable optical detection scheme for matter wave interferometry
New J. Phys. 7, 224 (2005), DOI: 10.1088/1367-2630/7/1/224
[“New Journal of Physics” highlight of 2005](#)
125. K. Hornberger, L. Hackermüller and M. Arndt
Influence of molecular temperature on the coherence of fullerenes in a near-field interferometer
Phys. Rev. A 71, 216 - 223 (2005), DOI: 10.1103/PhysRevA.71.023601
126. A. Stibor, K. Hornberger, L. Hackermüller, A. Zeilinger and M. Arndt
Talbot-Lau interferometry with fullerenes: Sensitivity to inertial forces and vibrational dephasing
Laser Phys. 15, 10 - 17 (2005), DOI: 10.48550/arXiv.quant-ph/0411118
127. M. Arndt, K. Hornberger and A. Zeilinger
Probing the limits of the quantum world
Physics World 18, 35 -40 (2005), DOI: 10.1088/2058-7058/18/3/28
128. M. Arndt, L. Hackermüller and E. Reiger
Interferometry with Large Molecules: Exploration of Coherence, Decoherence and Novel Beam Methods
Braz. J. Phys. 35, 216 - 223 (2005), DOI: 10.1590/S0103-97332005000200004
129. L. Hackermüller, K. Hornberger, B. Brezger, A. Zeilinger and M. Arndt
Decoherence of matter waves by thermal emission of radiation
Nature 427, 711 - 714 (2004), DOI: 10.1038/nature02276
[IOP physics highlight & APS physics news of 2004](#)
130. A. Chatzidimitriou-Dreismann and M. Arndt
Quantum Mechanics and Chemistry: The relevance of nonlocality and entanglement for molecules
Angew. Chem. 116, 146–147 (2004), DOI: 10.1002/anie.200320079
131. A. Stefanov, A. Stibor, A. Dominguez-Clarimon and M. Arndt
Sublimation enthalpy of dye molecules measured using fluorescence
J. Chem. Phys. 121, 6935 – 6940 (2004), DOI: 10.1063/1.1792551
132. K. Hornberger, J. Sipe and M. Arndt
Theory of decoherence in a matter wave Talbot-lau interferometer
Phys. Rev. A 70, 053608 (2004), DOI: 10.1103/PhysRevA.70.053608
133. L. Hackermüller, S. Uttenthaler, K. Hornberger, E. Reiger, B. Brezger, A. Zeilinger and M. Arndt
Wave nature of biomolecules and fluorofullerenes
Phys. Rev. Lett. 91, 90408 (2003), DOI: 10.1103/PhysRevLett.91.090408

- [NATURE News, 5th September 2003](#)
- [IOP Physics News, 5th September 2003](#)
- [Virtual Journal of Nanoscale Science & Technology, 8 \(10\), September 8 \(2003\)](#)

134. K. Hornberger, S. Uttenthaler, B. Brezger, L. Hackermüller, M. Arndt and A. Zeilinger
Collisional Decoherence Observed in MatterWave Interferometry
Phys. Rev. Lett. 90, 160401 (2003), DOI: 10.1103/PhysRevLett.90.160401
APS : Virtual Journal of Nanoscale Science & Technology, 7 (18), May 5,(2003)
135. L. Hackermüller, K. Hornberger, B. Brezger, A. Zeilinger and M. Arndt
Decoherence in a Talbot Lau interferometer: the influence of molecular scattering
Appl. Phys. B 77, 781 - 787 (2003), DOI: 10.1007/s00340-003-1312-6
136. O. Nairz, M. Arndt, A. Zeilinger
Quantum Interference Experiments with Large Molecules
Am. J. Phys. 71, 319 (2003), DOI: 10.1119/1.1531580
Virtual Journal of Nanoscale Science & Technology, 7 (12), March 24, (2003)
137. B. Brezger, M. Arndt and A. Zeilinger
Concepts for near-field interferometers with large molecules
J. Opt. B: Quantum Semiclass. Opt. 5, S82 - S89 (2003), DOI: 10.1088/1464-4266/5/2/362
138. O. Nairz, M. Arndt and A. Zeilinger
Experimental verification of the Heisenberg uncertainty principle for fullerene molecules
Phys. Rev. A. 65, pp. 032109, (2002), DOI: 10.1103/PhysRevA.65.032109
139. B. Brezger, L. Hackermüller, S. Uttenthaler, J. Petschinka, M. Arndt and A. Zeilinger
Matter-Wave Interferometer for Large Molecules
Phys. Rev. Lett. 88, 100404 (2002), DOI: 10.1103/PhysRevLett.88.100404
[APS News update 2002](#)
140. O. Nairz, B. Brezger, M. Arndt and A. Zeilinger
Diffraction of complex molecules by structures made of light
Phys. Rev. Lett. 87, 160401 (2001), DOI: 10.1103/PhysRevLett.87.160401
[Research highlights by NATURE](#)
141. M. Arndt, O. Nairz, J. Petschinka and A. Zeilinger
High Contrast Interference with C60 and C70
C. R. Acad. Sci. Paris 2, Série IV, 581-585 (2001), DOI: 10.1016/S1296-2147(01)01189-1
142. S. Franke-Arnold, M. Arndt and A. Zeilinger
Magneto-optical effects with cold Lithium atoms
J. Phys. B.: At. Mol. Opt. Phys. 34, 2527-2536 (2001), DOI: 10.1088/0953-4075/34/12/316
143. O. Nairz, M. Arndt and A. Zeilinger
Experimental Challenges in Fullerene Interferometry
J. Mod. Opt. 47, 2811 - 2821 (2000), DOI: 10.1080/09500340008232198

144. M. Arndt , O. Nairz, J. Voss-Andreae, C. Keller, G. van der Zouw and A. Zeilinger
Wave-particle duality of C60 molecules
Nature **401**, 680 – 682 (1999), DOI:10.1038/44348
APS physics highlight of 1999
145. P. Sziftgiser, D. Guéry-Odelin, P. Desbiolles, J. Dalibard, M. Arndt and A. Steane
Interferometry and Dissipative Optics with Atoms
Act. Phys. Polon. 93, 197 - 209 (1998): DOI: 10.12693/APHYSPOLA.93.197
146. M. Arndt, M. Ben Dahan, D. Guéry-Odelin, M. Reynolds and J. Dalibard
Observation of a zero-energy resonance in Cs-Cs collisions
Phys. Rev. Lett. **79**, 625 - 628 (1997), DOI: 10.1103/PhysRevLett.79.625
147. P. Desbiolles, M. Arndt, P. Sziftgiser and J. Dalibard
Dissipative atom optics
J. Mod. Opt. 44, 1827 - 1836 (1997), DOI: 10.1080/09500349708231849
148. P. Sziftgiser, D. Guéry-Odelin, M. Arndt and J. Dalibard
Atomic wave diffraction and interference using temporal slits
Phys. Rev. Lett. **77**, 4-7 (1996), DOI: 10.1103/PhysRevLett.77.4
149. P. Desbiolles, M. Arndt, P. Sziftgiser and J. Dalibard
Elementary Sisyphus process close to a dielectric surface
Phys. Rev. A. 54, 4292-4298 (1996), DOI: 10.1103/PhysRevA.54.4292
150. M. Arndt, P. Sziftgiser, J. Dalibard and A. Steane
Atom optics in the time domain
Phys. Rev. A 53, 3369-3378 (1996), DOI: 10.1103/PhysRevA.53.3369
151. S. Lang, M. Arndt, T.W. Hänsch, S.I. Kanorsky, S.Lücke, S.B. Ross and A. Weis
Local field effects in the spectroscopy of Cs atoms trapped in solid 4He
Low. Temp. Phys. 22, 129-130 (1996),
Fizika Nizkikh Temperatur 22, 171-173 (1996)
152. M. Arndt, S. I. Kanorsky, A. Weis and T. W. Hänsch
Long Electronic Spin Relaxation Times of Cs Atoms in Solid 4He
Phys. Rev. Lett. **74**, 1359-1362 (1995), DOI: 10.1103/PhysRevLett.74.1359
153. A. Buchleitner, D. Delande, J. Zakrzewski, R. N. Mantegna, M. Arndt and H. Walther
Multiple Time Scales in the Microwave Ionization of Rydberg Atoms
Phys. Rev. Lett. **75**, 3818-3821 (1995), DOI: 10.1103/PhysRevLett.75.3818
154. S. Lang, S. I. Kanorsky, M. Arndt, S. B. Ross, T. W. Hänsch and A. Weis
The Hyperfine Structure of Cs Atoms in the b.c.c. Phase of Solid 4He
Europhys. Lett. 30, 233-237 (1995), DOI: 10.1209/0295-5075/30/4/008
155. O. Benson, A. Buchleitner, G. Raithel, M. Arndt, R. N. Mantegna and H. Walther
From Coherent to Noise-Induced Microwave Ionization of Rydberg Atoms

- Phys. Rev. A 51, 4862-4876 (1995), DOI: 10.1103/PhysRevA.51.4862
156. M. Arndt, R. Dziewior, S. I. Kanorsky, A. Weis and T. W. Hänsch
Implantation and spectroscopy of metal atoms in solid helium
Z. Phys. B. 98, 377-381 (1995), DOI: 10.1007/BF01338409
 157. A.R. Weis, S. I. Kanorsky, M. Arndt and T. W. Hänsch
Spin physics in solid helium: experimental results and applications
Z. Phys. B. 98, 359-362 (1995), DOI: 10.1007/BF01338405
 158. S.I. Kanorsky, A. Weis, M. Arndt, R. Dziewior and T. W. Hänsch,
Pressure shift of atomic resonance lines in liquid and solid Helium
Z. Phys. B. 98, 371-376 (1995), DOI: 10.1007/BF01338408
 159. P. Szriftgiser, M. Arndt, P. Desbiolles, A. Steane and J. Dalibard
Atomic cavities
Ann. Physique 20, 681-686 (1995), DOI:10.1051/anphys:199556061
 160. S.I. Kanorsky, M. Arndt, R. Dziewior, A. Weis and T. W. Hänsch
Optical Spectroscopy of Atoms trapped in Solid Helium
Phys. Rev. B 49, 3645-3647 (1994), DOI: 10.1103/PhysRevB.49.3645
 161. L. Sirko, M. Arndt, P. M. Koch and H. Walther
Microwave ionization of Rb Rydberg atoms: Frequency dependence
Phys. Rev. A 49, 3831-3841 (1994), DOI: 10.1103/PhysRevA.49.3831
 162. S.I. Kanorsky, M. Arndt, R. Dziewior, A. Weis and T. W. Hänsch
Pressure shift and broadening of the resonance line of barium atoms in liquid helium
Phys. Rev. B 50, 6296 -6302 (1994), DOI: 10.1103/PhysRevB.50.6296
 163. M. Arndt, S.I. Kanorsky, A. Weis and T. W. Hänsch
Can paramagnetic atoms in superfluid helium be used to search for permanent electric dipole moments
Phys. Lett. A 174, 298 - 303 (1993), DOI: 10.1016/0375-9601(93)90142-M
 164. M. Arndt, A. Buchleitner, R. N. Mantegna, and H. Walther
Experimental Study of Quantum and Classical Limits in Microwave Ionization of Rubidium Rydberg Atoms
Phys. Rev. Lett. 67, 2435 - 2438 (1991), DOI: 10.1103/PhysRevLett.67.2435

B) Contributions to books

165. M. Arndt, S. Gerlich, K. Hornberger
Experimental Decoherence in Molecule Interferometry.
In: From Quantum to Classical. Essays in Honour of H.-Dieter Zeh.
ed. C. Kiefer, Springer, Cham (2022)
DOI: 10.1007/978-3-030-88781-0
166. S. Gerlich, Y.Y. Fein, A. Shayeghi, V. Köhler, M. Mayor, M. Arndt
Otto Stern's Legacy in Quantum Optics: Matter Waves and Deflectometry. In: Friedrich B., Schmidt-Böcking H. (eds) *Molecular Beams in Physics and Chemistry*. Springer, Cham. (2021)
DOI: 10.1007/978-3-030-63963-1_24
167. S. Gerlich, Y.Y. Fein, M. Arndt,
Interferometric tests of wave-function collapse
in "Do Wave Functions Jump?: Perspectives of the Work of GianCarlo Gihardi" eds. Valia Allori, Angelo Bassi, Detlef Dürr, Nino Zanghi, Springer International Publishing (2020),
DOI: 10.1007/978-3-030-46777-7
168. S. Gerlich, S. Kuhn, A. Shayeghi, M. Arndt,
The de Broglie Wave-Nature of Molecules, Clusters and Nanoparticles
in "21st Century Nanoscience - A Handbook: Nanophysics Sourcebook" ed. Klaus D. Sattler, CRC Press Taylor & Francis Group (2019), DOI: 10.1201/9780367333003
169. C. Brand, U. Sezer, S. Eibenberger, M. Arndt,
Matter-wave physics with nanoparticles and biomolecules
in: "Current Trends in Atomic Physics" eds. Antoine Browaeys, Thierry Lahaye, Trey Porto, Charles S. Adams, Matthias Weidemüller, Leticia F. Cugliandolo, Oxford University Press (2019),
DOI: 10.1093/oso/9780198837190.001.0001
1. J. Millen, S. Kuhn, F. Patolsky, A. Kosloff, and M. Arndt
Cooling and manipulation of nanoparticles in high vacuum
Proc. SPIE 9922, Optical Trapping and Optical Micromanipulation XIII, 99220C (2016)
DOI: 10.1117/12.2238753
170. M. Arndt, N. Dörre, S. Eibenberger, P. Haslinger, J. Rodewald, K. Hornberger, S. Nimmrichter and M. Mayor
Matter-wave interferometry with composite quantum objects,
in G. M. Tino & M. A. Kasevich (eds.), *Atom Interferometry*, IOS Press, Proceedings of the International School of Physics *Enrico Fermi* 188, p. 89-141, DOI 10.3254/978-1-61499-448-0-89.
171. M. Arndt
Über die Bedeutung von Grundlagenforschung und Wissenschaftsmanagement in Österreich ... und über Entscheidungen, die wir noch heute treffen sollten
in: "Wa(h)re Forschung? Science – Change of Paradigms?" Symposium 20.-21. Mai 2010
Anlässlich der Feierlichen Sitzung der Österreichischen Akademie der Wissenschaften (ÖAW: Forschung und Gesellschaft 2), Wien, p. 99-113 (2011)

172. M. Arndt and K. Hornberger
Quantum interferometry with complex molecules,
Proceedings of the International school of physics "E. Fermi", Vol. 171
Quantum Coherence in Solid State Systems
IOS Press, p. 103-125 (2009), DOI: 978-1-60750-039-1-1
173. M. Arndt
Mesoscopic Quantum Phenomena
Contribution to the 'Compendium of Quantum Physics', Ed. F. Weinert, D. Greenberger et al. in
print (2009) Compendium of Quantum Physics
2009, 379-384, DOI: 10.1007/978-3-540-70626-7_118
174. M. Arndt
Semiclassical Models
Contribution to the 'Compendium of Quantum Physics', Ed. F. Weinert, D. Greenberger et al.
Compendium of Quantum Physics p. 697-701 (2009), DOI: 10.1007/978-3-540-70626-7_197
175. M. Arndt, L. Hackermüller, K. Hornberger and A. Zeilinger
Coherence and decoherence experiments with fullerenes
in: "Decoherence, Entanglement, and Information Protection in Complex Quantum
Systems", Vladimir M. Akulin, A. Sarfati, G. Kurizki (Eds.), Kluwer, Amsterdam
189, p. 329-352 (2005)
176. M. Arndt, T. F. Gallagher, R. G. Fernandez, M. Leibscher, T. Opatrny and P. Pillet
Internal-Translational Entanglement and Interference in Atoms and Molecules
in: "Decoherence, Entanglement and Information Protection in Complex Quantum
Systems" Eds: V. M. Akulin, A. Sarfati, G. Kurizki and S. Pellegrin
Kluwer Academic Boston (2005)
177. M. Arndt and A. Zeilinger
Heisenberg's uncertainty and matter wave interferometry with large molecules
p. 35–52, in: *Fundamental Physics, Heisenberg and Beyond*
G. W. Buschhorn, J. Wess (Eds), Springer Berlin (2004)
178. M. Arndt, L. Hackermüller, K. Hornberger and A. Zeilinger
Organic molecules and decoherence experiments in a molecule interferometer
p. 1 - 10 in: *Multiscale Methods in Quantum Mechanics*,
P. Blanchard, G. Dell'antonio (Eds) Birkhäuser, Boston (2004)
179. M. Arndt and A. Zeilinger
Wave-particle experiments with large molecules
in: J. S. Al-Khalili, *Quantum: A guide for the perplexed*, Weidenfeld & Nicolson (2003)
180. M. Arndt, O. Nairz and A. Zeilinger
Wave-Particle Duality
in: *Year Book of Science & Technology*, McGraw-Hill (2002)
181. M. Arndt, O. Nairz and A. Zeilinger
Interferometry with macromolecules: Quantum paradigms tested in the mesoscopic

world

p. 333 - 351 in: "Quantum [Un] Speakables, From Bell Quantum Information", R. A. Bertlmann, A. Zeilinger (eds.), Springer, Berlin (2002)

182. M. Arndt, O. Nairz, G. van der Zouw and A. Zeilinger
Towards Quantum Optics of Macromolecules
Yearbook of the Institute Vienna Circle, ed. D. Greenberger, A. Zeilinger, p. 221-224,
Kluwer Academic, Dordrecht (1999)
183. M. Arndt
Optische Spektroskopie und Magnetresonanz an Metallatomen in fl. und festem 4-He
MPQ-Report 197, Dissertation, Garching (1995)

C) Conference Proceedings

184. M. Strauß, A. Shayeghi, M. Mauser, P. Manchet, M. Smacchia, J. Salapa, T. Kistersitz, P. Geyer, S. Daly, J. Commandeur, Y. Hua, A. Di Silvestro, M. Mayor, V. Köhler, J. Benserhir, C. Bruschini, E. Charbon, M. Castaneda, M. Gevers, R. Gourgues, N. Kalhor, A. Fognini, M. Arndt
Superconducting quantum detectors and single photon charge control for mass spectrometry
Proc. SPIE 12447, Quantum Sensing, Imaging and Precision Metrology, 12447I (2023),
DOI: 10.1117/12.2657258
185. S. Pedalino, B. Ramírez-Galindo, T. de Sousa, Y.Y. Fein, P. Geyer, S. Gerlich, and M. Arndt
Experimental challenges for high-mass matter-wave interference with nanoparticles
Proc. SPIE 12477, 124470K (2023), DOI: 10.1117/12.2657260
186. Y. Y. Fein, S. Gerlich, A. Shayeghi, P. Geyer, F. Kialka, V. Köhler, M. Mayor, M. Arndt
Universal matter-wave interferometry as a sensor in atomic physics and physical chemistry
Proc. SPIE 11700, 1170008 (2021), DOI: 10.1117/12.2586476
187. C. Brand, T. Susi, J. Kotakoski, M. Arndt, M. Debiossac, F. Aguillon, P. Roncin
Diffraction of 80 eV hydrogen through suspended graphene
J. Phys: Conf. Ser. 1412 202036 (2020), DOI: 10.1088/1742-6596/1412/20/202036
188. M. Arndt, A. Bassi, D. Giulini, A. Heidmann and J.-M. Raimond
Fundamental frontiers of quantum science and technology
Proc. Comp. Sci. 2011, DOI: 10.1016/j.procs.2011.12.024
189. M. Arndt, S. Gerlich, S. Eibenberger, P. Fagan, J. Tüxen and M. Mayor
Quantum interference experiments with organic molecules: Information about internal states of spatially quantum delocalized molecules
Am. Chem. Soc. 241, (2011)
190. S. Eibenberger, S. Gerlich, M. Tomandl et al.
Matter wave interferometry: exploring the importance of the internal molecular properties
Proc. CLEO EUROPE/EQEC, 1 (2011), DOI: 10.1109/cleoe.2011.5943412

191. M. Arndt, H. Ulbricht, A. Major, et al.
Molecular lithography - a quantum optical approach
Proc. CLEO/EQEC 2009, DOI: 10.1109/CLEOE-EQEC.2009.5192061
192. M. Arndt, M. Berninger, S. Deachapunya, S. Gerlich, L. Hackermüller, A. G. Major, M. Marksteiner, A. Stéfanov and H. Ulbricht
On the prospects of interferometry and deflectometry for characterizing large molecules
Eur. Phys. J. Special Topics 159, 1–9 (2008)
193. S. Gerlich, L. Hackermueller, F. Goldfarb, K. Hornberger, T. Savas, A. Stibor, H. Ulbricht, M. Arndt
A novel type of matter-wave interferometer for molecules
Proc. CLEO/Europe/IQEC, 1110 (2007), ISBN: 978-1-4244-0930-3
194. M. Arndt
Quantum Information: Philosophical, Mathematical and Experimental Perspectives
Quant. Inf. Proc. 5, 227-232 (2006)
195. K. Hornberger and M. Arndt
Environmental localization of matter waves
Source: Entanglement and Decoherence: Mathematics and Physics of Quantum Information and Computation, ed. by F. De Martini, G. Dell'Antonio, and S. Albeverio, Oberwolfach Reports 2, 219-221 (2005)
196. A. Stibor, A. Stefanov, F. Goldfarb, S. Deachapunya, A. Zeilinger and M. Arndt
Fluorescence methods for matter interferometry with nanosized objects
European Quantum Electronics Conference (IEEE Cat. No. 05TH8796) p.271|xviii+374 (2005)
197. F. Goldfarb, S. Deachapunya, A. Stefanov, A. Stibor, E. Reiger and M. Arndt
Fluorescence of surface adsorbed dyes: Investigation of a new detector for molecule interferometry
J. Phys. Conf. Ser. 19, 125-133 (2005)
198. L. Hackermüller, B. Brezger, K. Hornberger, S. Uttenthaler, E. Reiger, M. Arndt and A. Zeilinger
Decoherence studies using interferometry of massive molecules
Proc. EQEC 326 (2003): ISBN: 0-7803-7733-8
199. L. Hackermüller, B. Brezger, K. Hornberger, S. Uttenthaler, E. Reiger, M. Arndt and A. Zeilinger
Wave-particle duality with biomolecules and fluorinated fullerenes: A new record in matter wave interferometry
EQEC Conf. Digest (2003)
200. M. Arndt, L. Hackermüller and A. Zeilinger
Molecule Interferometry as a potential tool for nanostructuring applications
Proc. 4th EC/NSF Workshop on Nanotechnology, Tools and Instruments for Research and Manufacturing, Grenoble, France, June 12.-13. (2002)
201. M. Arndt, O. Nairz, J. Petschinka, J. Voss-Andreae, G. van der Zouw, C. Keller and A. Zeilinger
Coherence and Decoherence in de Broglie Interference of Fullerenes
IQEC 2000, Conf. Digest, p. 115, Nice, September (2000)

202. M. Arndt, P. Desbiolles, D. Guery-Odelin, A. Steane, P. Szriftgiser and J. Dalibard
Atom optics and interferometry with atomic mirrors
Proc. SPIE 2995, 174-181 (1997), DOI: 10.1117/12.273755
203. A. Weis, S. Lang, S. I. Kanorsky, M. Arndt, S.B. Ross and T.W. Hänsch
Long live the spin: cesium in solid helium
Proc. 12th Int. Conf. Laser Spectr 382-5 (1996)
204. M. Arndt, J. Dalibard, P. Desbiolles, W. Hänsel, P. Lemonde, O. Morice, E. Peik, H. Perrin, J. Reichel, C. Salomon, A. Steane and P. Szriftgiser
Atomic Cavities and Traps
Proc. 5th Symp. Freq. Stand. Metr.: Woods Hole, MA, USA, 231-42 (1996)
205. P. Szriftgiser, M. Arndt, P. Desbiolles et al.
Atomic cavities
4th Colloquium on Lasers and Quantum Optics Location: Ecole Polytechnique Nov. 1995
Annales De Physique: 20, 681-68 (1995), DOI: 10.1051/Anphys: 199556061
206. A. Weis, S. Kanorsky, S. Lang, M. Arndt, S. B. Ross, S. Lücke and T. W. Hänsch,
Old and new spin physics with atoms in solid helium
Proc. ICONO 95, SPIE Vol. 2799 p. 22-29, June 1995, St. Petersburg

D) Articles for a general physics audience

207. M. Arndt
Viewpoint: Free-Falling Interferometry
Physics 6, 23 (2013), DOI: 10.1103/Physics.6.23
208. M. Arndt
Exploring the limits of the quantum superposition principle
Physik Journal 12, 126, (2013)
209. M. Aspelmeyer and M. Arndt
Quantenphysik mit massereichen Objekten
Spektrum der Wissenschaft 12/12 40-44 (2012)
210. M. Arndt, M. Oberthaler and J. Schmiedmayer
Hamlet in der Quantenwelt.
Spektrum der Wissenschaft 1/12, 40-44 (2012)
211. J. Schmiedmayer and M. Arndt
Embracing quantum metrology with wide arms
APS Physics September 19th (2011)
212. M. Arndt, S. Gerlich, K. Hornberger and M. Mayor

Quanteninterferometrie mit komplexen Molekülen- Wie man Information über das Innenleben von Molekülen gewinnt, deren Ort man nicht kennt
Physik Journal 9, 37 – 43 (2010)

- 213. S. Gerlich and M. Arndt
Quantenfußball und Quantenspeerwurf: Physikspiele mit molekularen Materiewellen
Praxis der Naturwissenschaften 6, 5-12 (2009) und Plus Lucis (2/2009)
- 214. M. Arndt, L. Hackermüller and K. Hornberger
Wann wird ein Quantenobjekt klassisch?
Physik in unserer Zeit 37, 24 – 29 (2006)
- 215. M. Arndt, L. Hackermüller and K. Hornberger
Interferenzexperimente mit molekularen Quantenwellen
Physica plus, in English and Hebrew (2006)
- 216. O. Nairz, M. Arndt and A. Zeilinger
Doświadczenia z interferencją kwantową dużych cząsteczek
Postepy Fizyki 56, 114-121 (2005)
- 217. M. Arndt
Wann uns Quantenteilchen klassisch erscheinen,
Physik in unserer Zeit 35, 113-114 (2004)
- 218. M. Arndt
Freie Elektronen an sichtbarem Licht gebeugt
Physikalische Blätter 57, 20 (2001)
- 219. M. Arndt
Quantenoptik mit Molekülen und Clustern
DieUniversität.at 17.8.2001
- 220. M. Arndt und A. Zeilinger
Wo ist die Grenze der Quantenwelt?
Physikalische Blätter 56, 69-71, (2000)
- 221. M. Arndt
Quanteninterferenzen großer Moleküle
Mitteilungsblatt der ÖPG, 4, 8-17, (2000)
- 222. M. Arndt and O. Nairz
Grenzgänger: Welle-Teilchen Dualismus von C60
Plus Lucis 3, 5-7 (1999)

E) Patents

- 223. P. Geyer, M. Arndt, U. Sezer

Protective eyewear for laser radiation.

Patent Application Publication WO2017182431A1 (18.4.2016).

224. H. Ulbricht, N. Gotsche and M. Arndt

Devices for and methods of handling nanowires

Patent Application Publication No. WO2009/000285 A1 (31.12.2008)