

Thomas Juffmann, Assoc. Prof. Dr. Dipl.-Ing.

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[Quantum Microscopy and Biophysics](#)



universität
wien

Faculty of Physics

Quantum Optics, Quantum
Nanophysics and Quantum Information

Max Perutz Labs

Department of Structural
and Computational Biology

RESEARCH AND WORK EXPERIENCE

10/2021 – now	Associate Prof. at the Faculty of Physics and the Max Perutz Labs – Univ. of Vienna
03/2019 – 10/2021	Assistant Prof. at the Faculty of Physics and the Max Perutz Labs – Univ. of Vienna
03/2018 – 02/2019	Group leader ‘Quantum Microscopy and Biophysics’ – Univ. of Vienna
01/2017 – 03/2018	Fellow of the Human Frontier Science Program – Lab. Kastler Brossel, École normale supérieure , Paris (Prof. S. Gigan)
04/2013 – 12/2016	Postdoc at Stanford Univ. (physics - Prof. M. Kasevich)
06/2008 – 01/2013	Ph.D. at the Univ. of Vienna (Prof. M. Arndt)
12/2006 – 06/2008	Master thesis at the Univ. of Vienna (Prof. M. Arndt) and the Vienna Univ. of Technology (Prof. J. Schmiedmayer).
04/2006 – 06/2006	Internship at the Laboratoire de Physique des Solides of the Université Paul Sabatier in Toulouse , France

EDUCATION

06/2008 – 01/2013	Ph.D., Physics , Univ. of Vienna, Austria.
10/2002 – 06/2008	Bachelor & Masters, Applied Physics , Vienna Univ. of Technology, Austria

RESEARCH INTERESTS

- Interferometric Scattering Microscopy
- Phase-, Fluorescence-, and Fluorescence Lifetime Microscopy
- Quantum/Cavity enhanced microscopy
- Low damage electron microscopy
- Ultrafast electron optics & optoelectronics
- Quantum physics at mesoscopic scales & in biological systems

AWARDS AND HONORS

- 2022 ERC PoC grant
- 2021 FET proactive grant
- 2017 ERC starting grant
- 2017 Stanford Arts and Science Prize
- Results of PhD thesis in physics textbook: *Experimentalphysik 3, Atome, Moleküle und Festkörper* by Demtröder, Wolfgang (ISBN 978-3-662-49094-5), p. 87
- *Poster prize* at the ICAP 2012, French Physical Society
- 2012 *micrograph award*, Australian Microscopy & Microanalysis Research Facility
- *ESG-Nano-Prize 2010*, Erwin Schrödinger Society for Nanosciences

PUBLICATIONS / PRESENTATIONS / PATENTS

> **30 publications** in peer-reviewed journals (see <https://orcid.org/0000-0002-7098-5736>).

Selected publications:

- D Bouchet et al, Fundamental bounds on the precision of classical phase microscopes, *Phys. Rev. Appl.* 15, 2, 024047 (2021)
- R. Marchand et al., Optical near-field electron microscopy, *Phys. Rev. Appl.* 16, 1, 014008 (2021)
- T.Juffmann et al., Local Optimization of Wave-fronts for optimal sensitivity PPhase Imaging (LowPhi), *Optics Comm.* (2020).
- S. Leedumrongwatthanakun et al., 'Programmable linear quantum networks with a multimode fibre', *Nature Photonics* 14, 139–142 (2020).
- A. Bowman et al., Efficient wide-field FLIM, *Nature Comm.*, 10, 4561 (2019).
- T. Juffmann et al., Multi-pass transmission electron microscopy, *Scientific Reports* 7, 1699 (2017).
- T. Juffmann et al., Multi-pass microscopy, *Nat. Comm.* 7, 12858 (2016).
- T. Juffmann et al., Cavity enhanced RF photoelectron streaking, *Phys. Rev. Lett.* 115, 264803 (2015).
- Brand et al., An atomically thin matter-wave beam splitter, *Nat. Nanotechnology* 10, 845–848 (2015).
- T. Juffmann et al., Real-time single-molecule imaging of quantum interference, *Nat. Nanotechnology* 7, 297-300, (2012).
- T. Juffmann, Wave and Particle in Molecular Interference Lithography, *Phys. Rev. Lett.* 103, 263601 (2009).
- M. Arndt et al., Quantum physics meets biology, *HFSP J.* 3 386 (2009).



> **50 invited and contributed talks** at international conferences and seminars

1 U.S. patent, 3 patent applications

THIRD PARTY FUNDING

2021-2022	ERC Proof of Concept – EOFLIM (150k€, PI)
2021-2025	FET Proactive – ONEM (Total 3.7 M€, PI (1.3 M€), Coordinator & PI)
2017-2022	ERC Starting grant – MicroMOUPE (1.7M€, PI)
2017-2020	Gordon and Betty Moore Foundation – QEM II (6M\$, co-author)

2016-2018	Human Frontier Science Fellowship
2015-2016	Karl A. Van Bibber Fellowship

TEACHING

Courses taught at the University of Vienna:

- Quantum Optics I, exercises
- Advanced Atomic Physics, lectures and exercises
- The Physics of Matter Waves, lectures and exercises
- Introduction into 3D cryo electron microscopy, lectures
- Various seminars on matter waves, microscopy, and quantum measurement

ESTEEM FACTORS

- Referee for: Phys. Rev. Lett., Nat. Comm., ACS Photonics, npj Quantum Information, Ultramicroscopy, Applied Physics Letters, Applied Physics B, Journal of Synchrotron Radiation, Current Organic Chemistry, Measurement
- Grant proposal evaluation for: the European Research Commission, the National Science Center (Krakov, Poland), the University of Nebraska
- Chairman at conferences by CISCEM, SPIE, DPG, the Stanford Photonics Research Center, etc.
- Co-organizer of the VBC CRYO-EM SYMPOSIUM & Winter school, Vienna, Austria, 2019 & 2020
- Chair of organizing committee of workshop *Frontiers in Quantum Control of Free-Space Electrons*, San Francisco 2018
- Poster Juror and chairman at EIPBN 2017, Orland, Florida
- Organizer of the 2016 Free Quantum Electron Optics workshop in Half Moon Bay, California
- Organizer (2014 and 2015) of focus sessions at the annual symposium of the Stanford Photonics Research Center.

OUTREACH

- Art & Science, Photography at the speed of light (www.seecphotography.com); Exhibitions, events and talks at Aggregate Space Gallery, Berkeley Art Museum and Pacific Film Archive, Ars Electronica, Science @ Cal, SF Exploratorium, Univ. of San Francisco, Stanford University, Univ. of Vienna, Naturhistorisches Museum Wien, ...
- Music video with the Austrian soul band '5/8erl in Ehr'n': <https://youtu.be/00Q8yWPKkJw>
- Youtube videos ([vid1](#), [vid2](#)) on experimental results with more than 10⁵ views.
- Introductory lectures on 'Quantum Biology' and 'Matter Waves' for high school teachers.