Curriculum vitae

PERSONAL INFORMATION

Family name, First name	Esslinger, Tilman
Researcher unique identifier	ORCID 0000-0002-8333-107X
Date of birth	25 July 1965
Nationality	German and Swiss
URL for website	http://www.quantumoptics.ethz.ch/

- **EDUCATION**

1995	PhD in Physics, Ludwig Maximilian University of Munich and Max Planck Institute for Quantum Optics, Garching, Germany
1991	Diploma in Physics, Ludwig Maximilian University of Munich, Germany

- **CURRENT AND PREVIOUS POSITION**

2001 –	Full Professor, Department of Physics, ETH Zurich, Switzerland
1995 – 2001	Group leader, Ludwig Maximilian University of Munich, Germany
1991 – 1995	Research assistant, Max Planck Institute for Quantum Optics, Garching, Germany

- **INSTITUTIONAL RESPONSIBILITIES**

2023 –	Member of of Steering Committee Quantum Center ETH Zurich
2015 – 2023	Member of Research Commission ETH Zurich
2013 – 2015	Chair, Department of Physics at ETH Zurich
2011 – 2022	Vice-Director, National Centre of Competence in Research (NCCR) Quantum Science and Technology (QSIT), https://nccr-qsit.ethz.ch
2009 – 2013	Vice-Chair, Department of Physics at ETH Zurich
2008 –	Heading search committees as delegate of the President of ETH Zurich
2005 – 2007	Head of Institute of Quantum Electronics, ETH Zurich
2004 – 2008	Member of Strategic Planning Commission of ETH Zurich

- **COMMUNITY SERVICES**
  - Member of ERC panels (2012, 2015, 2016, 2019, 2021, 2023)
  - Member of advisory board Excellence Project TopDyn, University Mainz (since 2019)
  - Member of the External Advisory Board for Physics Department, Oxford University (2020)
  - Member of International Review Panel for Centre for Quantum Technologies, National University of Singapore (2011)

- **TEACHING ACTIVITIES**

  Taught since 2001 at ETH Zurich introductory, advanced and specialized courses and organized seminars, supervised BSc and MSc student projects.

- **ORGANISATION OF SCIENTIFIC MEETINGS**

2015, -18,-22	Co-Organizer, “Quantum Systems and Technology”, Monte Verità, Switzerland
2014, -16, -18	Co-Organizer, “Coherent Control of Complex Quantum Systems”, Okinawa, Japan
2013	Co-Organizer, “Quantum many body systems out of equilibrium“, Dresden, Germany
2013	Co-Organizer, workshop on “Optical Lattice Emulators and Beyond”, Aspen, US
2011	Co-Organizer, workshop on “Modeling Materials With Cold Gases”, Zurich, Switzerland
2011	Chair, 5th biannual conference on Bose–Einstein Condensation, Sant Feliu, Spain
2009	Co-Organizer, “Ab-initio modeling of cold gases”, Zurich, Switzerland
2009	Co-Organizer, “Quantum Engineering”, Monte Verità, Switzerland
2009	Vice-Chair, 4th biannual conference on Bose–Einstein Condensation, Sant Feliu, Spain
2005	Chair, “Control and Manipulation of Quantum Systems”, Monte Verità, Switzerland
2002	Chair, European Research Conference on Quantum Optics, Sant Feliu, Spain
2001	Vice-Chair, European Research Conference on Quantum Optics, Sant Feliu, Spain
1999	DPG Symposium “Laser cooling and Bose–Einstein condensation”, Heidelberg, Germany

- **FELLOWSHIPS AND AWARDS**

2024	JILA Visiting Fellow
2022	Honorary Doctor of Science from Heriot-Watt University in Edinburgh
2022	SNF Advanced Grant
2021	Senior BEC Award sponsored by TOPTICA Photonics AG (shared with Rudolf Grimm)
2016	Ugo Fano Lecturer, James Franck Institute, University of Chicago
2016	Senior Research Visitor Keble College, Oxford
2014	Elected Fellow of the American Physical Society
2014 –19 & 21	Listed as “Highly cited researcher” by Thomson Reuters/Clarivate Analytics
2011	37th Hanan Rosenthal Memorial Lecture, Yale University
2010 & 2017	ERC Advanced Grants
2001	Guest professorship at University of Innsbruck, Austria
2000	Phillip Morris Research Prize (shared with T.W. Hänsch and I. Bloch)

- **MAJOR SCIENTIFIC ACHIEVEMENTS**

  Since my appointment as full professor at ETH Zurich in October 2001 I built up one of the internationally leading research labs in the field of quantum gases and quantum simulation. We pioneered the research agenda of analog quantum simulation by synthetically creating and studying key models in quantum many-body physics. We have initiated and established three main research directions:

  • We carried out seminal experiments with quantum gases in optical lattices to explore Fermi–Hubbard physics and beyond, among them the first realizations of a fermionic Mott insulator, a quantum-gas analogue of graphene and the topological Haldane model, as well as the first observation of quantum magnetism in a Fermi–Hubbard model. In most recent work we realized a driven Fermi–Hubbard model and observed enhancement and sign reversal of magnetic correlations, and demonstrated a first step towards quantum simulation of lattice gauge theories.

  • We pioneered the study of Bose–Einstein condensates in cavity-QED settings, used it to provide a link to the physics of cavity-optomechanics, and realized the Dicke quantum phase transition. The cavity induces long-range interactions, which we very recently combined with a short-range interacting Bose–Hubbard model, leading to the observation of a first-order phase transition. Recently we observed a supersolid phase breaking a continuous symmetry, as well as the associated phase and amplitude modes.

  • A very recent and new line of research is the measurement of conductances in quantum gases, where we also demonstrated the equivalent of the thermoelectric effect and observed for the first-time quantized conductance in neutral matter.

- **PUBLICATIONS**

  Summary: Since 1992 more than 140 peer-reviewed publications, cited more than 38’000 times in total; h-index: 77 (Source: Google Scholar). 13 research papers in Nature and 10 in Science. Our realisation of the Haldane model [G. Jotzu, et al., Nature 515, 237 (2014)], an iconic concept in topological physics, featured prominently in the final paragraph of the advanced information of the 2016 Nobel Prize.

- **CONTRIBUTIONS TO THE EARLY CAREERS OF EXCELLENT RESEARCHERS**

  • Supervised 19 postdocs and 37 PhD students (+12 ongoing) at ETH Zurich. Several of the PhD students in my group received important awards for their doctoral research, which served both as a recognition of our work and as a catalyst for their career. Recent examples include the ETH Medal for Outstanding Doctoral Theses 2019 for Nishant Dogra, 2016 for Renate Landig, the Chorafas Prize 2015 and the ETH Medal for Outstanding Doctoral Theses for Sebastian Krinner, and the 2015 Prize for General Physics of the Swiss Physical Society for Gregor Jotzu. In 2014, Daniel Greif was shortlisted for the DAMOP Thesis Prize. Ferdinand Brennecke received the 2010 ETH Medal for Outstanding Doctoral theses, and Thilo Stöferle the 2006 Chorafas Prize and the ETH Medal for Outstanding Doctoral theses.

  • Of the PhD students and postdoctoral researchers I have supervised, many went on to become faculty members, including Henning Moritz (Professor at the University of Hamburg), Michael Köhl (Professor at the University of Cambridge, UK, now at University of Bonn), Leticia Tarruell (Professor at the ICFO, Barcelona, Spain), and Jean-Philippe Brantut (Professor at the École polytechnique fédérale de Lausanne, Switzerland), Yosuke Takasu (Professor at Kyoto University), Prof. Moonjoo Lee (Assistant Professor, Department of Electrical Engineering Pohang University of Science and Technology, South Korea), Julian Léonard (Assistant Professor at TU Vienna), Gregor Jotzu (Assistance Professor at the EPFL). Others are pursuing successful careers in industry, including two of my first PhD students at ETH Zurich, Anton Öttl, who co-founded the company qubig GmbH, and Thilo Stöferle, who is a permanent research-staff member at IBM Rüschlikon. Renate Landig and Daniel Greif are research scientists at Meta Reality Labs. Frederik Görg, VP Strategy at Climeworks.