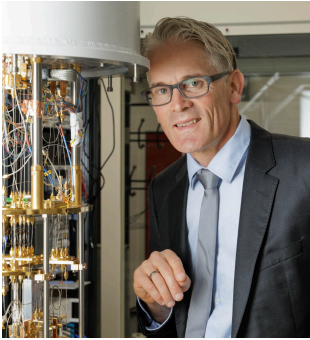


## PERSONAL INFORMATION



EPFL - Ecole Polytechnique Fédérale de Lausanne  
*"Laboratory of Photonics and Quantum Measurements"*  
 SB-LPQM, Station 3, CH-Lausanne, Switzerland  
*Citizenship:* Germany / Swiss (dual nationality)  
*Date of birth:* 8<sup>th</sup> Nov. 1976  
 Marital status: Married, two children (Maximilian, 11.07.2021 and Felix, 15.03.2024)  
 Email: [tobias.kippenberg@epfl.ch](mailto:tobias.kippenberg@epfl.ch) Internet: [k-lab.epfl.ch](http://k-lab.epfl.ch)  
<https://orcid.org/0000-0002-3408-886X>

## EDUCATION

|                                                                                                  |      |
|--------------------------------------------------------------------------------------------------|------|
| <b>Habilitation</b> in Experimental Physics, <b>Ludwig-Maximilians-Universität München</b> (LMU) | 2009 |
| <b>Ph.D.</b> in Applied Physics, <b>California Institute of Technology</b> (Caltech)             | 2004 |
| <b>M.S.</b> in Applied Physics, <b>California Institute of Technology</b> (Caltech)              | 2000 |
| <b>B.A.</b> in Physics and Electrical Engineering, <b>Technical University of Aachen</b> (RWTH)  | 1998 |

## PROFESSIONAL AND ACADEMIC EXPERIENCE

|                                                                            |                |
|----------------------------------------------------------------------------|----------------|
| <b>Swiss Federal Institute of Technology Lausanne (EPFL)</b>               |                |
| • Full Professor of Physics and Electrical Engineering                     | 2013 - Present |
| • Associate Professor of Physics and Electrical Engineering                | 2010 - 2012    |
| • Tenure Track Assistant Professor of Physics and Electrical Engineering   | 2008 - 2010    |
| <b>Max Planck Institute of Quantum Optics, Garching, Germany</b>           |                |
| • Full time Leader of an Independent Max Planck Junior Research Group      | 2005 - 2008    |
| <b>California Institute of Technology, Pasadena, USA</b>                   |                |
| • Graduate Research Assistant and Postdoctoral Scholar (K.J. Vahala group) | 1999 - 2005    |

## PRIZES

|                                                                                               |      |
|-----------------------------------------------------------------------------------------------|------|
| • <b>Marcel Benoist Prize</b>                                                                 | 2025 |
| • <b>R.W. Wood Prize</b> (for pioneering contributions to chip-scale optical frequency combs) | 2021 |
| • <b>ZEISS Research Award</b>                                                                 | 2018 |
| • <b>Klung Wilhelmy Wissenschafts Preis</b>                                                   | 2015 |
| • <b>Swiss National Latsis Award</b> (for research in "Cavity Quantum Optomechanics")         | 2014 |
| • <b>International ICO Award</b>                                                              | 2013 |
| • <b>EFTF Young Scientist Award</b> (for invention of the "monolithic frequency comb")        | 2011 |
| • <b>Fresnel Prize of the European Physical Society</b>                                       | 2009 |
| • <b>Helmholtz Prize for Metrology</b> (for invention of the "monolithic frequency comb")     | 2009 |
| • <b>1<sup>st</sup> Prize 8<sup>th</sup> European Union Contest for Young Scientist</b>       | 1996 |
| • <b>Jugend forscht Bundessieger Physik</b>                                                   | 1996 |

## FELLOWSHIPS &amp; DISTINCTIONS

|                                                                                      |                |
|--------------------------------------------------------------------------------------|----------------|
| <b>Clarivate Analytics ISI Highly cited in Physics (top 1% in domain of Physics)</b> | 2014 - present |
| <b>Member of German National Academy of Sciences Leopoldina</b>                      | 2024           |
| <b>International Member United States National Academy of Engineering (NAE)</b>      | 2024           |
| <b>Member of the Swiss Academy of Engineering Sciences (SATW)</b>                    | 2023           |
| <b>ERC Advanced Grant (2<sup>nd</sup>)</b>                                           | 2019           |
| <b>Optical Society of America Fellow</b>                                             | 2018           |
| <b>American Physical Society Fellow</b>                                              | 2016           |
| <b>ERC Advanced Grant</b>                                                            | 2012           |
| <b>ERC Starting Grant</b>                                                            | 2007           |
| <b>Marie Curie Excellence Grant</b>                                                  | 2006           |
| <b>Studienstiftung der Deutschen Volkes</b>                                          | 1998 - 2002    |

## RESEARCH INTERESTS

Quantum measurement of mechanical motion (quantum optomechanics) and integrated nonlinear optical devices, in particular chip-scale frequency combs (microcombs)

## OFTEN QUOTED PUBLICATION METRICS

- Clarivate Analytics <http://www.highlycited.com/> in Physics (1% top cited) in 2014 to 2025 (ongoing)
- Total number of citations to date: WoK > 49'200 (GoS: >77'680) – 9300 cited/year
- Journal publications : Nature (22), Science (14), Nature Photonics (15), Comm. (35), Physics (12), Nanotech (4), PRL (23). **Complete list found at <https://www.epfl.ch/labs/k-lab/publications>**
- 10 research papers with more than 1000 citations
- Hirsch-Index (N papers cited N times): WoK: 99 (GoS: 120)

---

#### INVITED TALKS

More than **327 invited talks** (16 plenary talks). A list can be found on my group website at [https://www.epfl.ch/labs/k-lab/wp-content/uploads/Kippenberg\\_ListTalks.pdf](https://www.epfl.ch/labs/k-lab/wp-content/uploads/Kippenberg_ListTalks.pdf)

---

#### SELECTED LIST OF CONTRIBUTIONS TO SCIENCE AND DISCOVERIES

- Discovery of ultra-high Q optical microresonators on a chip<sup>1</sup> – *Nature* (2003) [This paper has laid the foundation for the field of ultra-high Q microresonators. Cited >2000 times in GoS]
- Discovery of radiation pressure dynamical backaction amplification in a microresonator<sup>1</sup> – *Phys. Rev. Lett.* (2005) [First demonstration of radiation pressure backaction on a mechanical oscillator predicted by Braginsky in 1969. It lays the groundwork for the field of cavity optomechanics.]
- First demonstration of radiation pressure cooling of a mechanical oscillator (simultaneously with A. Heidmann and A. Zeilinger) – *Phys. Rev. Lett.* (2006) [Experiments triggered methods for ground state cooling of mechanical oscillators using radiation pressure cooling]
- Discovery of microresonator based optical frequency combs – *Nature* (2006) [This observation created a new research field at intersection of frequency metrology, nonlinear photonics, and microresonator Physics producing >1000 papers to date. Cited more than 1500 times GoS]
- First quantum theory of radiation pressure cooling (jointly with Wilhelm Zwerger, simultaneous to S. Girvin and F. Marquardt) – *Phys. Rev. Lett.* (2007) [This paper identified the quantum limit of radiation pressure cooling, cited >900 GoS]
- First demonstration of resolved sideband cooling of a mechanical oscillator – *Nature Physics* (2008) [Demonstration of sideband cooling of a mechanical oscillator, a key technique widely used in quantum optomechanics]
- First measurements at the standard quantum limit of mechanical imprecision – *Nature Physics* (2009)
- Demonstration of optomechanically induced transparency – *Science* (2011)
- First demonstration of quantum coherent coupling of an optical to a mechanical mode – *Nature* (2012)
- Discovery of temporal dissipative solitons in an optical microresonator – *Nat. Photon.* (2014) [This research created the field of “soliton micro-combs” producing >2000 papers to date. Cited >1000 times GoS]
- Demonstration of coherent communication with Kerr combs (with C. Koos<sup>1</sup>) – *Nat. Photon.* (2014)
- First measurement of a mechanical oscillator at the thermal decoherence rate – *Nature* (2015)
- Optomechanical theory of Surface Enhanced Raman Scattering (SERS) – *Nature Nanotech.* (2016) [This paper inspired experiments that explored optomechanical effects in molecular vibrations]
- Observation soliton induced Cherenkov radiation in an optical microresonator – *Science* (2016) [This paper demonstrated dissipative solitons on a photonic chip]
- Terabit communications with photonic chip soliton frequency combs (with C. Koos) – *Nature* (2017)
- Demonstration of room temperature quantum correlations – *PRX* (2017) [This paper, along with work from NIST Gaithersburg, demonstrated room temperature quantum optomechanical effects]
- Ultrafast optical ranging with microresonator soliton combs (jointly with C. Koos) – *Science* (2018)
- Highest Q of a room temperature mechanical oscillator using strain engineering - *Science* (2018)
- Massively parallel LiDAR using soliton microcombs, *Nature* (2020)
- An integrated turnkey microcombs [jointly with K. Vahala, J. Bowers] *Nature* (2020)
- Piezoelectric control of soliton microcombs [with Sunil Bhawe], *Nature* (2020)
- Parallel convolutional processing using an integrated photonic tensor core [jointly with W. Pernice & co-workers], *Nature* (2021)
- Laser soliton microcombs heterogeneously integrated on silicon [jointly with J. Bowers], *Science* (2021)
- Integrated photonics enables continuous-beam electron phase modulation [jointly with C. Ropers], *Nature* (2021) [This paper demonstrated for the first time electron photon interactions in the continuous wave regime]

---

<sup>1</sup> This joint publication earned our collaborator C. Koos the “Landesforschungspreis Baden Württemberg 2014”

- A photonic integrated circuit-based erbium-doped amplifier, *Science* (2022) [**This paper demonstrated for the first time an Erbium amplifier with commercial grade performance on chip**]
- Cavity-mediated electron-photon pairs, [jointly with C. Ropers], *Science* (2022)
- Superconducting circuit optomechanics in topological lattices, *Nature* (2022)
- Demonstration of a traveling wave optical parametric amplifier, *Nature* (2022) [**This paper demonstrated for the first time a net gain traveling wave parametric amplifier on chip**]
- Ultrafast tunable lasers using lithium niobate integrated photonics [jointly with P. Seidler], *Nature* (2023)
- Room-temperature quantum optomechanics using an ultra-low noise cavity, *accepted in Nature* (2024) [**This paper demonstrated for the first time room temperature quantum optomechanical squeezing with solid state mechanical oscillators**]
- Free-electron interaction with nonlinear optical states in microresonators [jointly with C. Ropers, MPI], *Science* (2024) [**This work demonstrates for the first time solitons interaction with free electrons**]
- Lithium tantalate electro-optical photonic integrated circuits for high volume manufacturing, *Nature* (2024) [**This paper introduced for the first time Lithium Tantalate integrated photonic circuits**]
- Collective ground state cooling of a mechanical oscillator, *Science* (2024) [**This paper demonstrates for the first time ground state cooling of a collective mechanical mode**]

#### ADVANCEMENT OF YOUNG RESEARCHERS

I take a keen interest in advancing the careers of my co-workers, as witnessed by their success today (prizes, positions, papers). These efforts have contributed to their future success as independent scientists, with **22 secured positions as group leaders or professors** (8 in the field of optomechanics). I also actively scout Prizes for my co-workers, resulting in 3 EPS-QEOD best thesis prizes, the Latsis Prize, the IOP best thesis award, the Otto-Hahn Medal, and the Helmholtz Prize. Two of my students obtained the EPFL Doctorate Award.

#### Academic appointments of co-workers and prizes:

1. Prof. Albert Schliesser, University of Copenhagen, **Full Professor** (ERC Grantee, EPS Thesis Prize, Otto Hahn Medal, Latsis Prize)
2. Dr. Pascal Del'Haye, Group Leader MPI Erlangen (EPS Thesis Prize, Helmholtz Prize of Metrology)
3. Prof. Dr. Tobias Herr, **Assistant Professor**, DESY Hamburg (IOP best thesis award, EPS Thesis Prize, ERC Grantee)
4. Prof. Ewold Verhagen, Group Leader AMOLF, Professor at Eindhoven (ERC Grantee, Marie Curie IF)
5. Prof. Pierre Verlot, **Assistant Professor**, University of Nottingham (ERC Grantee)
6. Dr. Olivier Arcizet, Permanent Researcher, CNRS, France (ERC Grantee)
7. Dr. Samuel Deléglise, **Associate Professor**, LKB - OMQ (Marie Curie IF)
8. Dr. Christine Wang, DRAPER Laboratory (Marie Curie IF)
9. Prof. Christophe Galland, **SNF Professorship**, EPFL (ERC Grantee, SNF Ambizione Fellowship)
10. Dr. Caroline Lecaplain, Research Professor, University of Arizona (Marie Curie IF)
11. Prof. Dalziel Wilson, **Assistant Professor** of Optical Sciences, University of Arizona (Marie Curie IF)
12. Prof. Hairun Guo, **Assistant Professor**, Shanghai University (Marie Curie IF)
13. Prof. Vivishek Sudhir, **Assistant Professor**, Massachusetts Institute of Technology
14. Prof. Itay Shomroni, **Assistant Professor**, Hebrew University of Jerusalem (Marie Curie IF)
15. Prof. Junqiu Liu, **Assistant Professor**, Univ. Science & Technology China (EPFL Doctorate Award, EPS Thesis Prize)
16. Dr. Erwan Lucas, Permanent Researcher, CNRS, France (EPFL EDPO best thesis award)
17. Prof. Nils Engelsen, **Assistant Professor**, Chalmers Univ. (ERC Grantee, SNF Ambizione Fellowship)
18. Prof. Johann Riemensberger, **Assistant Professor**, Norwegian Institute of Technology (Marie Curie IF, SNF Ambizione Fellowship)
19. Prof. Yang Liu, **Assistant Professor**, Huazhong University of Science and Technology (HUST), China (Marie Curie IF)
20. Prof. Shingo Kono, **Assistant Professor**, Niels Bohr Institute, Denmark (Marie Curie IF)
21. Prof. Yujia Yang, **Assistant Professor**, Univ. Science & Technology China (Marie Curie IF)
22. Prof. Jianqi Hu, **Assistant Professor**, The University of Hong Kong

#### Industrial appointments of co-workers and technology transfer (selected):

- Dr. Emanuel Gavartin, director of research, Zeiss AG Oberkochen (EPFL Doctorate Award)
- Dr. Michael Geiselmann (Marie Curie CO-FUND) & Dr. Michael Zervas, co-founders of LiGenTec SA <https://www.ligentec.com>
- G. Anetsberg Patent Lawyer (Munich), J. Dobrindt (McKinsey Consulting Munich), R. Riviere, Technical Manager (Airbus Munich)

#### INDUSTRIAL INNOVATION

- I co-founded **LIGENTEC S.A.** (<https://www.ligentec.com>, 2016), a company commercializing tightly confining ultra-low loss Si<sub>3</sub>N<sub>4</sub> integrated photonic circuits (PIC) that I have developed in my lab since 2011 as a pure play foundry service, and manufactured using proprietary and patented techniques developed in my laboratory. LIGENTEC manufactures today in a 200 mm automotive CMOS line at X-Fab in France, constituting the largest capacity foundry offering of photonic integrated circuits in Europe<sup>2</sup>. [www.ligentec.com](http://www.ligentec.com)
- I co-founder of **DEEPLIGHT S.A.** (<https://deeplight.ai>, 2021), a company commercializing photonic integrated light sources based on the combination of piezoelectrical actuators and ultra-low loss silicon nitride PICs as developed in collaboration with Sunil Bhawe in Purdue.
- I am co-founder of **LUXTELLIGENCE S.A.** (<https://luxtelligence.ai>, 2022), a lithium niobate pure-play foundry based on a novel deep etching technology developed by my lab based on diamond-like carbon (DLC). The company democratized access to ferroelectric photonic integrated circuits (LTOI and LNOI).
- I am founder of **EDWATEC S.A.** (<https://www.edwatec.com>, 2023) a company developing rare-earth ion doped photonic integrated circuits for photonic integrated circuit-based Erbium amplifiers and lasers.

#### SERVICE TO THE ACADEMIC COMMUNITY

I have taken an active role in organizing topical meetings around quantum optomechanics and microresonator frequency combs, and have been the sole organizer of several (6) *Monte Verità* workshops:

- Organizer of Monte Verità Workshop “Quantum Optics of Micro and Nanomechanical Systems”, 2019, 2016, 2014, 2011
- Organizer of Monte Verità Workshop “Microresonator based Optical Frequency Combs”, 2016
- Organizer of Monte Verità Workshop “Microresonator based Optical Frequency Combs”, 2014
- Chair of the Gordon Research Conference “Mechanical Systems at the Quantum Limit”, 2012

#### SCIENTIFIC COORDINATOR OF RESEARCH NETWORKS

I have taken a vested interest in shaping the European cavity quantum optomechanics and optical frequency comb communities by being the *sole coordinator of four large-scale networks*:

- Coordinator of DARPA OpTIm 2023 – 2027 (USD 2.6 Mio)
- Coordinator of FET-Open “TeraSlice” 2020-2023 (€3.6 Mio)
- Coordinator of FET-Proactive “Hybrid Optomechanical Technologies” 2017-2021 (€10 Mio)
- Coordinator of Marie Curie Training Network “Optomechanical Technologies” 2016-2020 (€3.9 Mio)
- Coordinator of Marie Curie Training Network “Cavity Quantum Optomechanics” 2012-2016 (€5.7 Mio)

#### FUNDING RECORD

I raised more than **52.14 million CHF** in 2013-2025 **for my laboratory**. This includes performing in more than 7 DARPA programs (ORCHID, SCOUT, PULSE, DODOS, LUMOS, NAPSAC, OPTIM) and receiving funding from the AFOSR. The breakdown of funding for my lab from 2013-2025 (12 years) includes:

- EU Funding: **23.48 Mio CHF** (45%)
- Swiss National Science Foundation: **11.31Mio CHF** (21.69%)
- US DARPA and AFOSR: **14.38 Mio CHF** (27.57%)
- European Space Agency: **0.86 Mio CHF** (3.66%)
- Industry: **1.17 Mio CHF** (2.24%)
- Other: **0.94 Mio CHF** (1.8%)

<sup>2</sup> <https://www.xfab.com/news/details/article/ligentec-and-x-fab-collaboration-creates-europes-largest-capacity-foundry-service-for-integrated-photonic-circuits>