TECHNISCHE UNIVERSITÄT WIEN

# PhD position in theoretical quantum optics at TU Wien

We are seeking applications by highly motivated candidates for a PhD position in the field of theoretical quantum optics, atomic physics, and quantum many-body physics. The successful candidate will engage in cutting-edge theoretical research on the collective and nonlinear properties of strongly interacting atomic ensembles and photons systems, with applications on technological aspects of quantum physics: such as quantum communication, quantum simulation, and quantum metrology. The research will involve in particular:

- the development and application of numerical methods to study open quantum many-body systems with finite-range interactions,
- the theoretical description of light-matter interactions and photon propagation in mesoscopic systems of quantum emitters,
- the design and analysis of innovative approaches for manipulating quantum states of photons and atomic qubits with near-term experimental applications

The PhD position will be embedded in the joint project “Quantum Interconnects for Neutral-Atom Processors” with the Swiss Quantum Initiative with anticipated collaborations between our group at the TU Wien and the groups of Prof. Wenchao Xu (experimental quantum science) and Prof. Joseph Renes (theoretical quantum information) at the ETH Zurich. Hence, the prospective student will be part of an international research team with close connections between theory and experiment.

## Tasks:

- analytical and numerical research on problems in theoretical quantum optics and many-body physics,
- collaboration with theoretical and experimental partner groups,
- active participation in scientific events
- contribution to teaching tasks at the host institute
- contribution to supervision of undergraduate students
- writing of scientific publications and doctoral thesis

## Your Profile:

- Master or Diploma degree in physics or equivalent university studies,
- keen interest in theoretical quantum optics, atomic physics, and many-body theory,
- strong analytical and numerical skills,
- ability to work independently and in a team-oriented research environment,
- Good communication skills in English (spoken and written).

**Institution:** TU Wien is Austria’s largest research and higher education institution in science and technology, with 5,650 employees and 26,100 students. The hosting group of Prof. Thomas Pohl is part of the Institute for Theoretical Physics, engaging in interdisciplinary research on light-matter interactions at the interface of atomic, optical, and many-body physics.

**Position:** The position is offered for 4 years with a minimum gross salary of 2.786,10 €/month gross (14 times/year for 30 hours/week), incl. full health and social insurance. The position offers opportunities for continuing personal and professional education, flexible working hours, collaborations in an international research environment, and possibilities for research stays abroad.

**Application:** Applications should consist of a cover letter (including motivation for applying to this position), a CV (including publication list), a copy of the applicant's master thesis and transcripts. Applicants should also arrange for at least one recommendation letter. All documents should be combined in a single pdf file and sent to thomas.pohl@itp.tuwien.ac.at.

For further inquiries, please contact Prof. Thomas Pohl (thomas.pohl@itp.tuwien.ac.at). Review of the applications and interviews will begin August 1st and continue until the position is filled. The position shall start as soon as possible but offers flexibility concerning the starting date.

TU Wien is committed to increasing the proportion of women in particular in leadership positions. Female applicants are explicitly encouraged to apply. Preference will be given to women when equally qualified.