

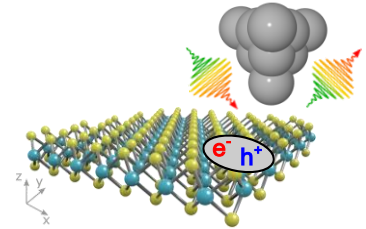
[Light and matter theory group](#) at Institute of Physics (FZU) of the Czech Academy of Sciences (CAS) in Prague invites applications for the position:

## Postdoctoral Researcher in theoretical atomic-scale optics of low-dimensional materials

The successful candidate (m/f/d) will join a new research team lead by [Tomáš Neuman](#) established to investigate atomic-scale optical properties of molecules and low dimensional materials, particularly in the context of scanning probe microscopy and spectroscopy.

### **What you will do:**

- Focus on the investigation of transport and optical properties of 2D materials (transition-metal dichalcogenides - TMDCs, graphene-based structures, intrinsic, or artificially created defects in them, or [hetero]structures derived from them); perform, analyze, and interpret electronic-structure calculations using suitable first-principles software
- Integrate results of ab-initio calculations into models addressing light-matter interaction in atomic-scale optical environments (light emission in scanning tunneling microscopy – STML, tip-enhanced photoluminescence - TEPL). This involves, e.g., solving Maxwell or Poisson equations in dielectric environments with suitable input sources
- Develop models to address the dynamics of electron transport, excitons, and photons in atomic-scale optical environments (e.g., quantum master equation, Lindblad formalism)
- Participate in group meetings, preparation of manuscripts and dissemination of results at conferences
- Work in an international environment in the heart of Europe and collaborate with our international partners in Europe and beyond



### **Required qualifications:**

- PhD in physics, chemistry, or related field
- Operational knowledge of methods to address excitations in 2D materials and derived structures (e.g., Quantum Espresso, ABINIT). Programming skills (e.g., Python, Matlab, FORTRAN, C, C++)
- Advanced English (written and spoken) is a must
- Will to learn new techniques and approaches

### **Beneficial qualifications:**

- Experience with ab-initio modelling of optical properties of solids, particularly 2D materials
- Knowledge of theory of plasmonics and nanophotonics and methods used therein
- Modelling of scanning-tunneling microscopy and related phenomena

### **Terms of employment:**

- Start of employment as soon as possible, depending on the availability of the applicant
- Full-time job with flexible hours, extended vacations, work from home, and [a wide range of other benefits](#)
- 1- 2-year contract with possible extension

### **Application procedure:**

- Please send your CV and motivation letter, including the publication record to the email address below: Monika Svobodová, Email: [monika.svobodova@fzu.cz](mailto:monika.svobodova@fzu.cz).
- For further information please contact Tomáš Neuman: [neuman@fzu.cz](mailto:neuman@fzu.cz) - Head of Working Group

Information regarding personal data processing and access to personal data at the Institute of Physics of the Czech Academy of Sciences:

<https://www.fzu.cz/en/about-fzu/official-noticeboard/processing-of-personal-data>