We are looking for postdoctoral researchers strengthening the projects “Single-cavity dual-combs for field-deployable spectroscopy”, “Comb-Mode Resolved Lamb-Dip Spectroscopy”, and “Precision Characterization of Mid-Infrared Crystalline Supermirrors” (see descriptions below).

The positions are open to be filled immediately (start date negotiable) with a duration of initially 12 months and offer ample opportunities for personal growth. Each successful applicant will be responsible for data analysis, experimental automation, and the dissemination of results by writing articles and by presenting at international conferences. You will be a leading part of a thriving, ambitious and energetic team. Successful applicants are encouraged to apply for additional independent national and international funding to strengthen their independent profile.

Background Information

The research group works in close collaboration with an industrial partner (Thorlabs Inc., Santa Barbara, USA). We work on novel approaches to precision spectroscopy. Recent work focused on ultra-low-noise fiber laser oscillators [1,2], high-power low-phase-noise chirped pulse amplifiers [3] and highly-reflective crystalline mirrors in the mid-infrared [4]. Building on this groundwork, successful applicants will advance and deploy these technologies for mid-infrared Doppler-free spectroscopy experiments enabling absorption spectroscopy at an unprecedented level of accuracy, sensitivity and precision. The individual projects are conducted in three teams, which work in close collaboration.

Further opportunities during the research stay include the possibility to work with our international academic and industrial collaborators, such as DESY (Germany), University of Alberta (Canada), Université de Neuchâtel (Switzerland), Nicolaus Copernicus University (Poland), NIST Gaithersburg (USA), and Thorlabs Inc. (USA).

Your Skills and Qualifications

- A PhD degree in Physics/Engineering, ideally in the fields of optical metrology, optical spectroscopy, physical chemistry is required.
- Excellent knowledge of English (C1) is mandatory.
- We expect working knowledge of MATLAB/Python/LabView (or comparable) for data analysis.

How to Apply

Please apply via email to oliver.heckl@univie.ac.at and attach a CV, relevant transcripts and a short motivation letter.
Employment Conditions

- Extent of Employment: 40 h/week (25 days of paid annual leave)
- Gross salary EUR 4 350 per month, paid 14 times per year, in accordance with the collective bargaining agreement, §49 (3)b). Taxes include medical and social insurance.
- Teaching duties: Guidance of PhD students within the scope of the project.
- Main working language: English
- Place of work is the Faculty of Physics, located in close proximity to the city center.

Opportunity: Single-Cavity Dual-Comb (DC) Lasers for Field-Deployable Spectroscopy

- Development of power amplifiers and frequency converters to shift the central wavelength of Yb:fiber- and Er:fiber-based DC lasers towards the fingerprint region
- Design of a portable field-deployable solution based on laboratory setups
- Experience with solid-state and/or fiber lasers, optical fibers (including PCF), or nonlinear optics is an asset.

Opportunity: Comb-Mode Resolved Lamb-Dip Spectroscopy

- Development of a high-average-power mid-infrared femtosecond optical parametric amplifier
- Design and implementation of an enhancement cavity based on crystalline supermirrors
- Spectroscopy of acetylene, including preparation of gas samples
- Experience with spectroscopic experiments, optical fibers, nonlinear optics, enhancement cavities or multipass-cells is an asset.

Opportunity: Precision Characterization of Mid-Infrared Crystalline Supermirrors

- Development and characterization of next-generation mid-infrared crystalline supermirrors
- Design and characterization of cutting-edge metrological measurement setups
- Implementation of cutting-edge mirror technology in cavity-enhanced spectroscopy experiments
- Experience with optical metrology, mid-infrared spectroscopy, or characterization of optical material properties is an asset.
- A strong background in uncertainty analysis, statistics and metrology using a suitable programming language (e.g., Python/R) is valuable.

References