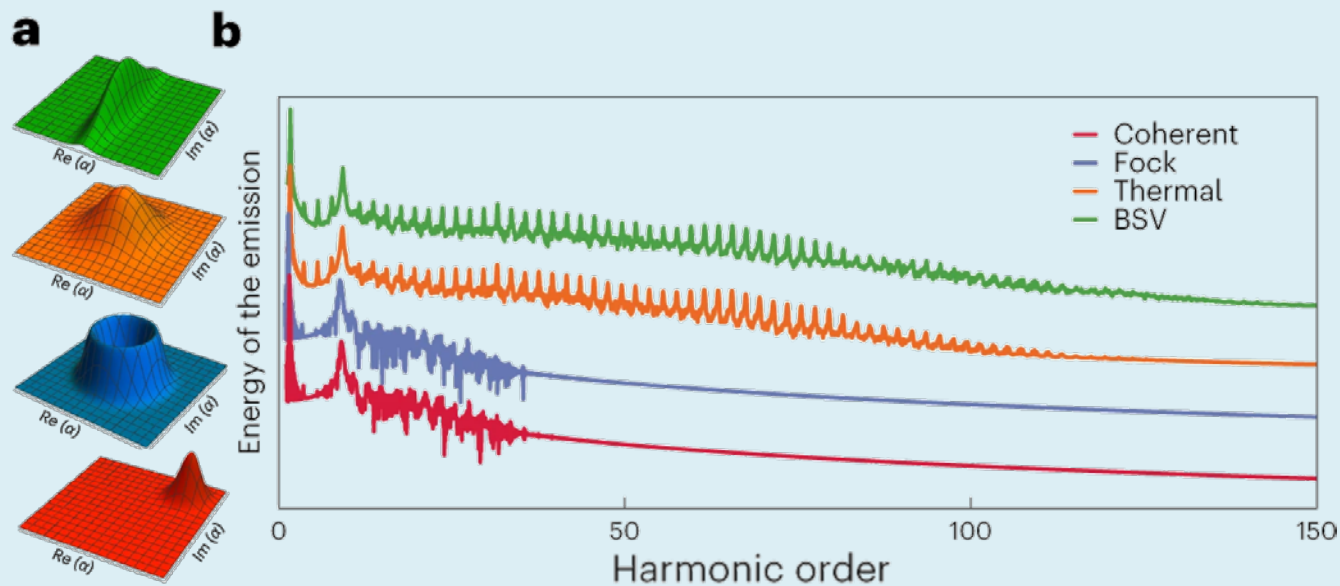


## Joint PhD position proposal: Quantum High-Harmonic Generation


We propose a joint Jülich RC/Technion position for an experimentalist PhD student to investigate the interplay of high harmonic generation with quantum optics. Our project aims at building a bridge between two research fields that are usually thought to be disconnected: strong-field physics that relies on large photon numbers, and quantum optics that usually operates with low photon numbers and non-classical properties.



Pumping high-harmonic generation with different quantum states of light is expected to dramatically affect emission spectrum.

This bridge will open a new field in quantum optics, accessing new spectral regimes such as the extreme ultraviolet (XUV) that were seen as almost completely classical. This bridge will also connect quantum optics to new extremes enabling unique correlation measurements on attosecond timescales. Such novel connections will lead to ultrafast measurements with higher accuracy, sub-shot noise interferometry and imaging at extremely high frequency, and completely new regimes of entanglement in photonics.

**The Laser Dynamics in Solids group in  is one of the most advanced experimental facilities worldwide in generating ultrafast, extreme-intensity light pulses, and in generation of high harmonics: [Laser Dynamics in Solids](#)**

**The AdQuanta group at the  is one of the world leaders in ultrafast electron microscopy. The group develops unique theoretical capabilities for exploring the physics of novel kinds of electron-photon interactions: [AdQuanta](#)**

### Research highlights:

- The first interaction of a free electron with quantum light [[Science 373, 6561 \(2021\)](#)]
- Bright squeezed vacuum changes high-harmonic generation [[Nature Physics 19, 1689 \(2023\)](#)]
- Bright squeezed vacuum influences attosecond electron dynamics [[Nature Photonics 17, 501 \(2023\)](#)]

Reach out to interview for this PhD program and get to work in leading laboratories in Israel and Germany. On top of a full PhD fellowship, the position includes a special housing allowance and substantial support for frequent international travels between Germany and Israel.

To apply, kindly forward your CV and a cover letter to [kaminer@technion.ac.il](mailto:kaminer@technion.ac.il) and [r.adam@fz-juelich.de](mailto:r.adam@fz-juelich.de). Please note: acceptance to the program necessitates successful interviews at both Technion and the Jülich Research Center.