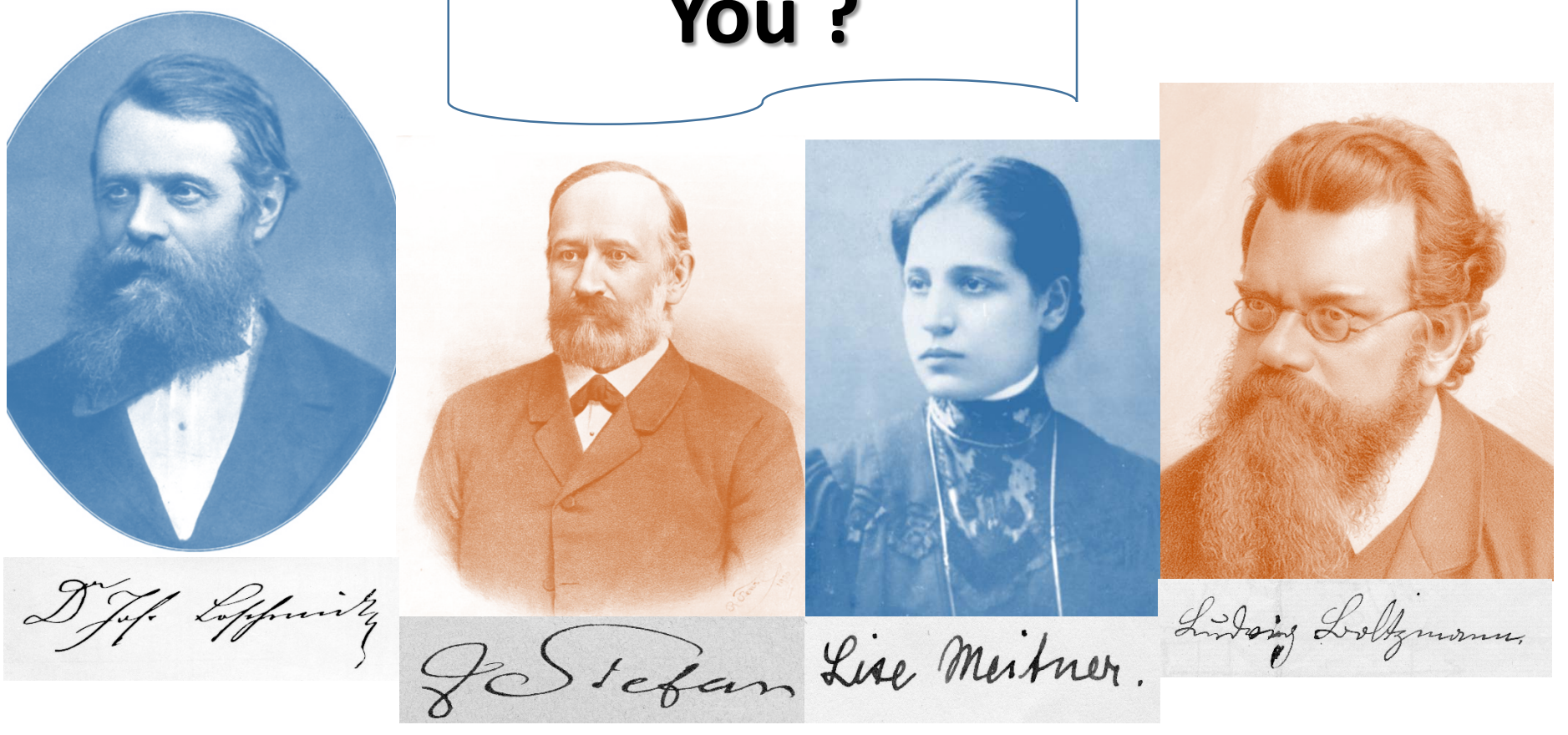
Vienna Doctoral School in Physics

VIENNA - DOCTORAL - SCHOOL - PHYSICS

Open call for PhD fellowships

You ?



Application deadline: 31 December
Hearings in Vienna: 22& 23 February 2018
More info: vds-physics.univie.ac.at

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Aerosol Physics

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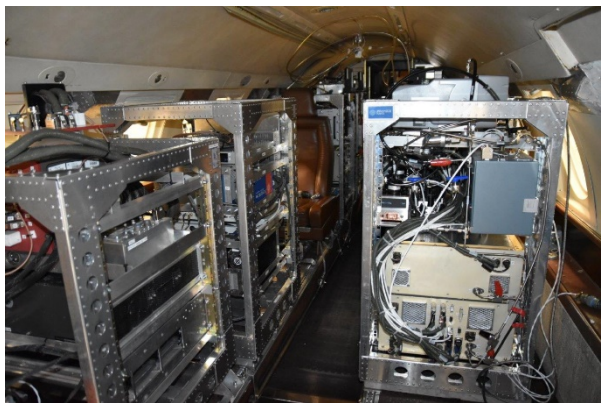
The VDS program offers research opportunities in various different research groups working in experimental, theoretical or computational physics. As a VDS fellow you will have a regular employment at the University of Vienna, will be part of a visible community of young scientists and you will have the opportunity to participate in diverse and multiple scientific events and activities.

Prof. Bernadett Weinzierl „Atmospheric and Aerosol Physics“



Position 1 *Airborne measurements of the complex refractive index of atmospheric aerosol layers*

The overall aim of this PhD project is to determine the complex refractive index of single aerosol particles in complex aerosol mixtures. This includes the characterization and further development of a novel instrument for vertically-resolved measurements of complex refractive index and size of single aerosol particles, the analysis of data from the A-LIFE (www.a-life.at) field experiment, and the collection and analysis of new data.

Position 2 *Properties of aerosol mixtures in the Eastern Mediterranean during the A-LIFE aircraft field experiment.*

The overall aim of this ERC-funded PhD project is to study the partitioning between mineral dust and black carbon (BC) absorption in aerosol mixtures which we investigated during the A-LIFE field experiment in the Eastern Mediterranean in April 2017. This project includes the analysis of in-situ size distribution data of total aerosol and BC, the derivation of optical properties, and the assessment of mineral dust and BC contribution to the total absorption for the investigated aerosol layers.

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Prof. Paul Winkler „Aerosol Nanoparticle Formation“

Nucleation and growth rate measurements from anthropogenic precursors in chamber and field experiments

An open PhD position is currently available in the framework of a Marie Sklodowska-Curie Innovative Training Network called CLOUD-MOTION. The successful candidate will conduct experimental studies of nanoparticle formation using cutting-edge instrumentation for nanoparticle detection and sizing. This work will partly be performed at the CLOUD experiment at CERN, Switzerland. In addition, field experiments in Vienna are planned to investigate urban nucleation.

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Material Physics

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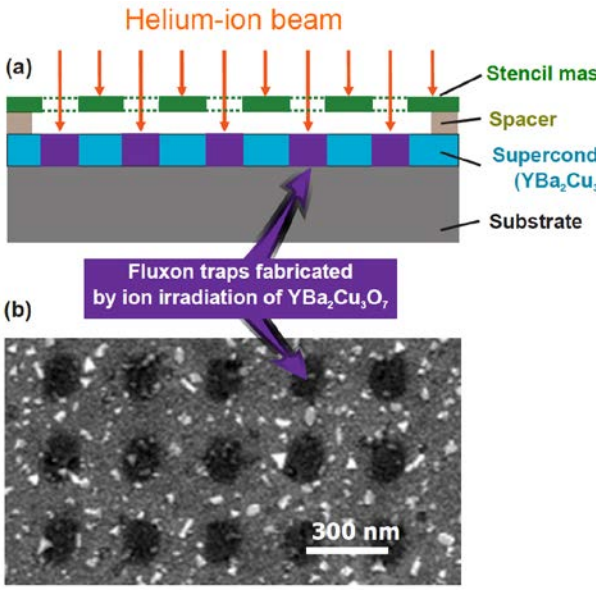
Prof. Wolfgang Lang „Superconductivity“



Trapping and manipulating superconducting vortices by artificial pinning landscapes

Tailored artificial pinning defects allow to investigate many ways of flux quanta manipulation, like guided vortex motion, vortex ratchets, flux-flow transistors and other cutting-edge concepts. The critical state of a superconductor with a regular pinning array is different from the classical one and will be explored by various electrical transport measurements. The project will be embedded in a European research network (COST) that started recently and provides regular training schools and international contacts. The successful candidate should have a solid background in Solid State Physics. Experience in superconductivity, low-temperature techniques, and magneto-transport measurement methods is welcome.

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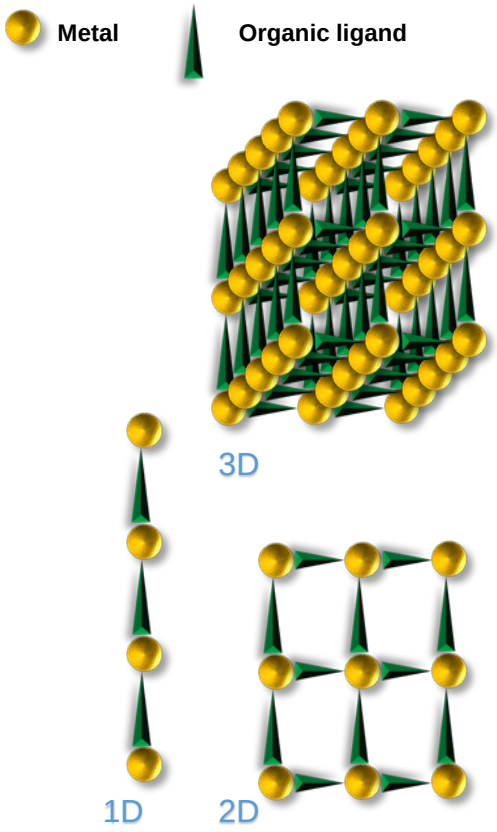
Prof. Thomas Pichler „Low Dimensional Quantum Solids“



1D, 2D and 3D Metal-organic frameworks (MOFs)
MOFs represent a new class of compounds that consist of metal nodes and organic ligands to form various nanostructures. Our project, in cooperation with TU Wien and J. Heyrovsky Institute of Physical Chemistry in Prague, aims to study quantum confinement effects in MOFs for optoelectronic and spintronic applications.

2. Advanced nanochemistry and nanospectroscopy in filled nanotubes

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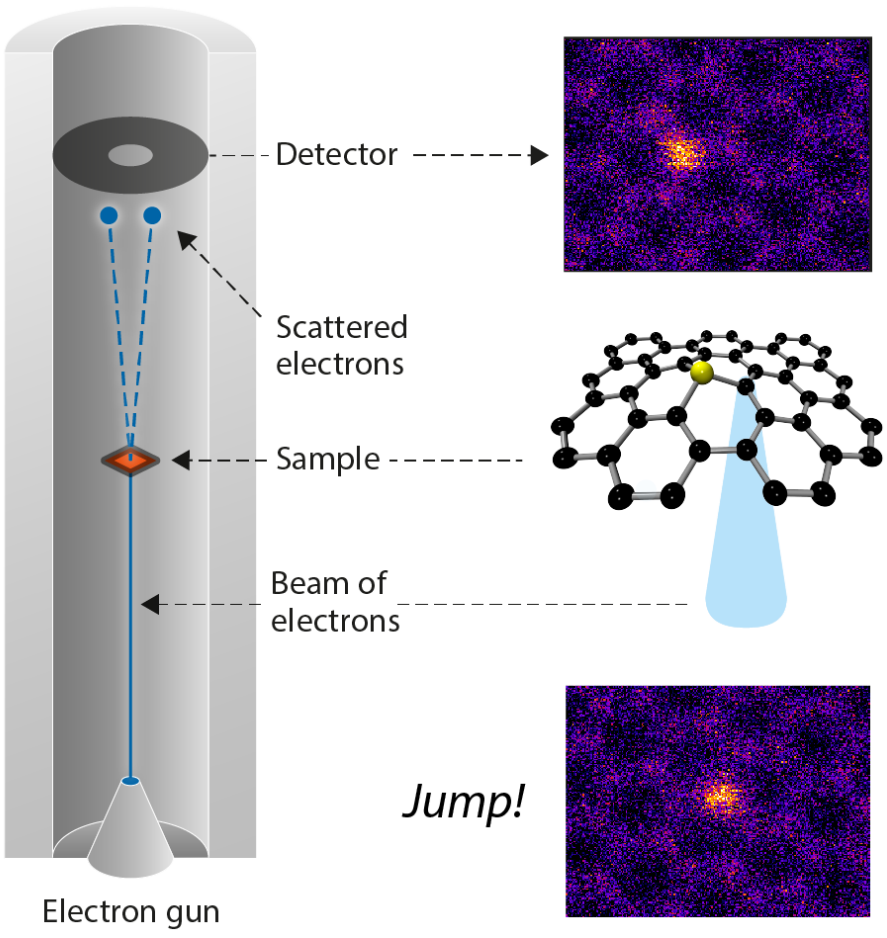
Dr. Toma Susi „Single-atom manipulation in the electron microscope“



Scanning transmission electron microscopy is now able to resolve atoms by focusing the electron beam with sub-atomic precision. We found that the scattering of the energetic imaging electrons can move a silicon impurity through the graphene lattice, revealing the potential for atomically precise manipulation using the Ångström-sized electron probe. To develop this into a practical technique, the *ERC Starting Grant* project ATMEN advances heteroatom implantation, characterization and manipulation. The ideal candidate is familiar with electron microscopy and/or ion implantation, but a strong background in materials science or nanotechnology may suffice.

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Quantum Physics

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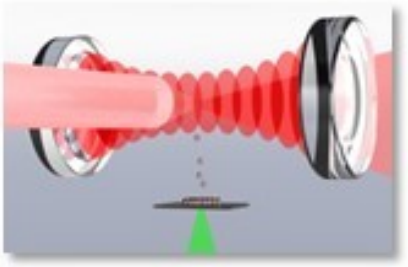
Prof. Markus Arndt

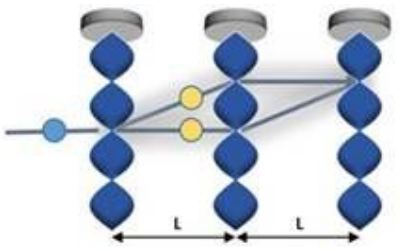
„Quantum Nanophysics and Molecular Quantum Optics“



Position 1

Cavity cooling of dielectric nanoparticles

Our project focuses on novel techniques to launch and cool dielectric nanoparticles for advanced quantum interference experiments, aiming at pushing the interface between quantum physics and the classical world.



Position 2

Matter-waves interfacing with nanobiological matter

Our project targets novel developments at the interface between quantum physics and nanobiological materials, aiming at extending our insight into coherence, measurement and the role of complexity in quantum physics.

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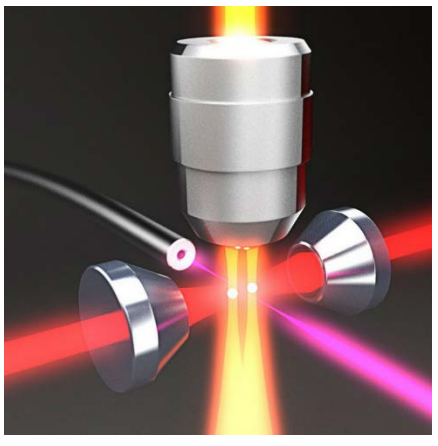
Prof. Nikolai Kiesel

„Stochastic and quantum thermodynamics with levitated particles“



Position 1

An SLM-based optical trap for levitation: Spatial light modulators (SLMs) have enabled an impressive level of performance in control and readout of optically trapped objects in liquid. Optical traps in vacuum have thus far made nearly no use of these possibilities. Within the project, an SLM based optical trap for complex potential landscapes will be developed.

Position 2

Reservoir engineering of levitated particles: Based on our know-how in cavity control of levitated particles, a platform to engineer non-thermal and non-classical baths for the center-of-mass motion of nanoparticles will be developed. This also includes the design of a superior mechanism to transfer nanoparticles to the optical cavity.

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