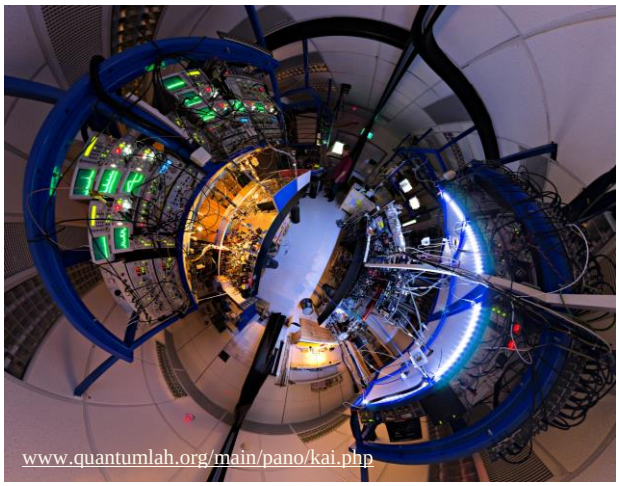
PhD Candidacy on Quantum Gases with Ultracold Polar Molecules

Centre for Quantum Technologies, National University of Singapore

Project Description



You are looking for an experimental PhD project in the area of ultracold quantum gases. At the Centre for Quantum Technologies (CQT) and the National University of Singapore we have an opening for a PhD research project to study a quantum gas of dipolar ground-state molecules. The exquisite control over quantum matter has enabled a vast experimental progress in the study of many-body systems with relevance to precision measurements, quantum information, and quantum simulation. Dipolar molecules are at the forefront of the field of ultracold quantum gases. The electric dipole of the molecules gives rise to a long range and non-isotropic interaction between the molecules. This allows to study intriguing phenomena that typically are not occurring in cold atom systems. The task of the project is to control the internal states of the molecules and to study the effects of the interaction in two-dimensional trapping and optical lattice geometries. The project is based on our previous frequency comb based spectroscopy of large samples of LiK molecules. For this combination a particularly large dipole moment can be exploited and effects of interaction are expected to dominate the temperature scale.

We are searching for a highly motivated individual who is expected to play a pivotal role in our research team. If you enjoy experimenting with cutting-edge technologies in a state of the art laser cooling laboratory you are welcome to join our team and participate in ongoing measurements from the start. For more information please visit:

Quantum Matter research group: qmatter.quantumlah.org/

Kai Dieckmann: qmatter.quantumlah.org/personal/Dieckmann/

Scholarship Program

CQT (www.quantumlah.org/) is situated on the campus of the National University of Singapore. The centre is running its own PhD scholarship program offering a top-class coursework and research opportunities. With its over 150 international research staff and students CQT is providing a globally visible and inspiring environment for research in experimental and theoretical quantum physics. The broad range of topics includes ultracold quantum gases, quantum optics, and quantum information. The bond free scholarship offers S$3,200/month and allowances for books, relocation, and conference travel. For more information: www.quantumlah.org/openings/phd/.

Singapore

Located in the heart of South-East Asia, Singapore is a developed city-state offering impeccable infrastructure, superb food and celebrated multiculturalism. The climate is warm year-round. The National University of Singapore was ranked 24 in the QS World University Rankings 2013/14 and identified as the number one in Asia.

Application

You are a motivated and curious junior scientist and have a degree in physics (or will obtain it in the near future). Coursework already completed during a masters program can be considered for credit at CQT. Ideally, you have built a background in quantum mechanics, atomic physics, and quantum optics, and have already worked in a cold atom or laser laboratory. Application documents should comprise of a CV, a set of transcripts (including an explanation of the grade system), and a single page motivational statement. Applications will be considered immediately until the position is filled. Please do not hesitate to direct your enquiry to Kai Dieckmann (phydk@nus.edu.sg).