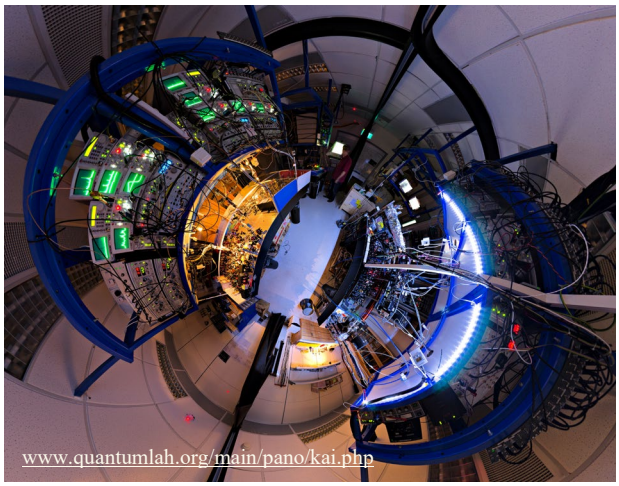
PhD Candidacy on Ultracold Polar Molecules in Optical Lattices

Centre for Quantum Technologies, National University of Singapore

Project Description



Are you 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. Quantum technologies like 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. Research on 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 them. This enables the study of intriguing quantum phenomena in optical lattices that cannot be studied with atom. In particular in this project we are interested in demonstrating new forms of resonant interaction between the molecules based on their dipole moment. We apply this to the quantum simulation of many body quantum phases low dimensional deep optical lattices, where the lifetime of the gas exceeds the time scale for the formation of many-body phenomena. The project is based on our large samples of LiK ground state molecules for which a particular high large dipole moment can be achieved, such that the long-range interaction dominates the temperature scale. We are looking 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 the Quantum Matter research group at: qmatter.quantumlah.org/

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 and is open for applications all year round. 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 generous stipends and allowances for books, relocation, and conference travel. For more information: https://cqtphd.quantumlah.org/

Singapore

Located in the heart of South-East Asia, Singapore is an ultra-modern city-state offering impeccable infrastructure, superb food and celebrated multiculturalism. The climate is warm year-round. The National University of Singapore was ranked 11th in the QS World University Rankings 2019 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 master's program can be considered for advance credit. 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).