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MNU MATARIKI NETWORK OF UNIVERSITIES
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## MATARIKI QUANTUM NETWORK

Quantum science concerns the physic of the very small, from single quanta up to large systems with emerging quantum behaviour. It also deals with the development of quantum measurement and quantum information technologies. Various research fields contribute to the breathtaking development in these areas, such as condensed matter physics, cold atom physics, photonics, material- and nanosciences. Exchange between researchers within the subfields and interdisciplinary approaches are the key to deepening insights and for the development of innovative quantum technologies. We invite researchers from the Matariki network to discuss the perspectives of quantum sciences.
A workshop devoted to the following subjects shall start discussions to identify unique research strengths and future collaborative projects.

## TOPICS

- Quantum Gases
- Rydberg Atoms
- Quantum Measurement
- Quantum Instruments
- Hydrid Quantum Systems

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# Quantum Science WORKSHOP

**MNU PARTNERS:** DARTMOUTH COLLEGE | DURHAM UNIVERSITY | QUEEN'S UNIVERSITY
UNIVERSITY OF OTAGO | UNIVERSITY OF TÜBINGEN | UNIVERSITY OF WESTERN AUSTRALIA
UPPSALA UNIVERSITY

July 1 – 4, 2013 University of Tübingen, Alte Aula

FACULTY OF SCIENCE
**Department of Physics**

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# PARTICIPANTS | PROGRAM

## DURHAM UNIVERSITY | DEPARTMENT OF PHYSICS

Matt Jones
**Many body physics with cold Strontium Rydberg atoms**

Simon Cornish
**Probing quantum many-body physics with bright matter-wave solitons and ultracold polar molecules**

Simon Gardiner
**Dynamics in atomic Bose-Einstein condensates: dynamical depletion and self consistency in the non-condensate fraction**

Kevin J. Weatherill
**Cold ion and electron sources from laser-cooled atoms**

Ifan Hughes
**Absolute absorption and dispersion of light in dense alkali-metal vapours**

## NEWCASTLE UNIVERSITY | JOINT QUANTUM CENTRE

A. Joy Allen
**The effect of finite temperature on quantum turbulence in BECs: Modelled using "ZNG"**

Nick Proukakis
**Stochastic growth and pattern formation of two-component condensates**

## UNIVERSITY OF OTAGO
JACK DODD CENTRE FOR QUANTUM TECHNOLOGY

Blair Blackie
**Degenerate dipolar gases: rotons and fluctuations**

Thomas Billam
**Two-dimensional quantum turbulence**

Niels Kjaergaard
**Scanning optical tweezers for ultracold atom studies**

## NATIONAL UNIVERSITY SINGAPORE
## NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE
## CENTRE FOR QUANTUM TECHNOLOGIES SINGAPORE

Rainer Dumke
**Cold atoms and superconductors**

Filip Auksztol
**Poster: Ultra cold atoms in toroidal optical lattice**

Herbert Crepaz
**Tailored optical potentials**

Lim Chin Chean
**Poster**

Chan Kin Sung
**Electric field in proximity of cryogenic surface**

Oon Fong En
**Characterization of the avalanche ionization in an ultra-cold Rydberg gas**

Ley Li Yuan
**Poster: Atomic magnetometry**

Christoph Hufnagel
**Poster**

## UNIVERSITY OF WESTERN AUSTRALIA

Michael Tobar
**High-Q acoustic and electromagnetic cavities and application to quantum systems**

## QUEEN'S UNIVERSITY

Eugene Zaremba
**Dissipative dynamics of atomic Bose-Einstein condensates**

Stephen Hughes
**TBA**

## UNIVERSITY OF STUTTGART

Tilman Pfau | Sebastian Hofferberth
**Strongly interacting Rydberg gases**

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## UNIVERSITY OF TÜBINGEN
CQ CENTER FOR COLLECTIVE QUANTUM PHENOMENA

Daniel Braun
**Quantum metrology – beyond entanglement assisted schemes**

Daniel Cano
**Asymmetric Rydberg blockade**

József Fortágh
**Cold atom/superconductor hybrid quantum systems**

Andreas Günther
**Cold atoms at nanotips**

Thomas Judd
**Casimir-Polder interaction between cold atoms and nanotubes**

Dieter Kölle
**Sensitive nano-SQUIDs for the investigation of small spin systems**

Reinhold Kleiner
**Fractional Josephson vortices**

Sebastian Slama
**Plasmonic nanostructures for ultracold atoms**

Alexander Stibor
**Ion interferometry**

Claus Zimmermann
**Collective quantum phenomena with cold atoms in a ring resonator**

**THEME LEADER: UNIVERSITY OF TÜBINGEN | CONTACT: PROF. JÓZSEF FORTÁGH**
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