IIP 2017

Max Planck Institute of Quantum Optics
Garching, Germany

Helena Casademunt ‘19
Max Planck Institute of Quantum Optics

- What is MPQ?
  - Research center located in Garching, near Munich
  - Specialized in the fields of quantum information and quantum effects in light-matter interaction

- My group: quantum optics theory
- My supervisors: Prof. Ignacio Cirac and Prof. Norbert Schuch
The institute
Job Description

- Research intern in theoretical quantum optics
- Study of topological phases of matter and their excitations using tensor networks
- Numerical simulations of phase transitions in quantum spin liquid states
  - *toric code, resonating valence bonds*
Typical day at work

- run simulations with Matlab; make phase diagrams and other plots
- discuss my work with graduate students
- meet with the principal investigator
- attend weekly theory group meetings
- attend weekly colloquia with invited professors organized by the institute
Most rewarding aspects of work

- **learning**
  - to work as part of a research group, with researchers of many different backgrounds
  - to use analytical and numerical tools in research
  - what world-leading research is like

- **impact**
  - my results will be used in future work of the group
  - final report will allow for my work to be continued
Visiting Garching with the other interns
Cultural experience

- We got to know German culture and travel around Europe!