# **School schedule**

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| **Time** | **07.06** | **08.06** | **09.06** | **10.06** |
| 8:00-9:00 |  | *Arrival* | *Breakfast* |
| 9:00-10:30 | Gross | Eisert | Gross |
| 10:30-11:00 | Coffee break |
| 11:00-12:30 | Kastoryano | Kastoryano | Kastoryano |
| 12:30-13:00 | Free time |
| 13:00-14:00 | *Lunch* |
| 14:00-14:30 | Free time | *Departure* |
| 14:30-16:00 | **Check in** | Gross | Eisert |
| 16:00-16:30 | Coffee break |
| 16:30-18:00 | Eisert | Poster session |
| 18:00-19:30 | *Dinner* |

## Meals

Breakfast, lunch, dinner, and the coffee breaks are covered by the school.

During coffee breaks there will be some food, namely fruit and yogurts before noon, and fruit and cakes in the afternoon.

## Drinks

All drinks at breakfast are included.

At lunch and dinner, there will be water and juice on your tables; you are free to order other drinks but we are not able to cover them.

During coffee breaks on Friday and Saturday 5 drinks 0.2l each are covered, as well as 3 drinks during the coffee break on Sunday.

The dining room will be closed after 19:30, however, a bistro will be open. You will be given 6 coupons, 2 euro each, for your drinks in the bistro throughout the school.

All the other expenses will have to be paid for by yourselves. Please remember what you will have consumed and pay in cash before leaving the school.

## Sport and other activities

The swimming pool can be used free of charge. You can pick up the keys at the reception. However you have to sign a responsibility agreement ahead, because there will be no superintendent/Bademeister in charge. The same applies to other sport halls, as long as they are not in use.

If you go hiking, please make sure that someone staying at the school knows where you are going in case of emergency.

## Emergency contacts:

* Laura Baez (English), +49 172-375-0575
* Terenz Feng (German, English), +49 174-390-5820

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| Literature | Content | Course name | Lecturer name | **Lectures plan** |
| Lecture 3 | Lecture 2 | Lecture 1 |
| Nielsen and Chuang, "Quantum information and computation" | - P, NP, BQP, and where we stand- Non-universal "quantum supremacy"  via sampling problems? | - Talking to your bank (or Snapchat):  Public key crypto- Quantum Fourier transform &  order finding- Sketch of Shor's algorithm | - Gate model of quantum computation- Grover search | **Introduction into quantum information and quantum computation** | **David Gross** |
|  | - QEC conditions and topological  order (LTQO)- QEC as the ground subspace of  gapped topological models- Approximate QEC, and other new  directions | - The Toric code- Decoding and the error correction  threshold- Gates and the fault-tolerant  threshold (Eastin-Knill theorem) | - Classical error correction: repetition  code, [n,k,d]- CSS and stabilizer codes - Concatenation and the Shor code- Sources of Error | **Quantum error correction** | **Michael Kastoryano** |
|  | - Equilibration and thermalization of  many-body systems- Many-body localization- Wrap-up: Physical realizations of  "quantum supremacy" and QEC | - Phases of matter- Topological order captured in terms  of tensor networks | - Area laws and the "physical corner  of Hilbert space"- Matrix product states- Projected entangled pair states- Multi-scale entanglement  renormalization | **Quantum information for condensed matter physics** | **Jens Eisert** |