Quantum Computing Materials Challenges

Monday August 27, 2018

8:00–8:50 *Check-In/Light Breakfast (Hosted by IPAM)*

8:50–9:00 *Welcome and Opening Remarks*

9:00–9:40 **Matthias Troyer** (Microsoft Research)
Quantum Computing Materials Challenges

10:00–10:15 *Break*

10:15–10:55 **Yoshihisa Yamamoto** (Stanford University)
Physics of quantum-to-classical crossover and coherent Ising machines

11:15–11:30 *Break*

11:30–12:10 **Garnet Chan** (California Institute of Technology)
Classical and quantum simulations of quantum materials

12:30–2:30 *Lunch (on your own)*

2:30–3:10 **Eric Cances** (École Nationale des Ponts-et-Chaussées)
What can applied mathematicians do for you?

3:30–4:00 *Break*

4:00–4:40 **Edwin Barnes** (Virginia Tech)
Modeling and cancellation of noise in semiconductor quantum dot spin qubits

5:00–6:30 *Poster Session & Reception (Hosted by IPAM)*

Tuesday August 28, 2018

8:00–9:00 *Check-In/Breakfast (Hosted by IPAM)*

9:00–9:40 **Markus Reiher** (ETH Zurich)
What is required for solving chemical problems on a quantum computer?

10:00–10:15 *Break*

10:15–10:55 **Bela Bauer** (Microsoft Station Q)
Dynamics of Majorana-based qubits

11:15–11:30 *Break*

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11:30–12:10 **Roman Lutchyn** (Microsoft Research)
Scalable Designs for Quasiparticle-Poisoning-Protected Topological Quantum Computation with Majorana Zero Modes

12:30–2:30 *Lunch (on your own)*

2:30–3:10 **Susan Coppersmith** (University of Wisconsin-Madison)
Building a Quantum Computer Using Quantum Dots in Silicon/Silicon-Germanium Heterostructures

3:30–4:00 *Break*

4:00–4:40 **Hidetoshi Nishimori** (Tokyo Institute of Technology)
Performance enhancement of quantum annealing by non-traditional quantum driving

Wednesday August 29, 2018

8:00–9:00 *Check-In/Breakfast (Hosted by IPAM)*

9:00–9:40 **Rick Muller** (Sandia National Laboratories)
Modeling quantum and nanoscale semiconductor electronic devices

10:00–10:15 *Break*

10:15–10:55 **Yasuyuki Kawahigashi** (University of Tokyo)
Topological phases of matter, modular tensor categories and operator algebras

11:15–11:30 *Break*

11:30–12:10 **Sophia Economou** (Virginia Tech)
Defects in SiC: Electronic structure, spin control, and spin-photon interfaces

12:30–2:00 *Lunch (on your own)*

2:00–2:30 **Zhenghan Wang** (Microsoft Research)
Qubit Materialization Challenges: Rise above the Noise

2:30–3:30 *Discussion led by Eric Cances & Mitchell Luskin*