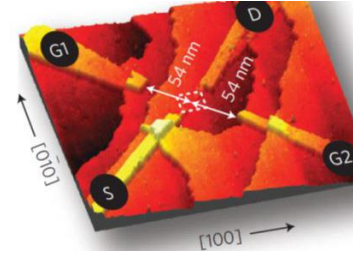


International Workshop on Silicon Quantum Electronics August 18–20, 2017



Jones Farm Conference Center
Hillsboro, Oregon

Program

Friday, August 18, 2017

- 8:00 Buses depart from hotels to Jones Farm Conference Center
Continental breakfast provided at Jones Farm Conference Center
- 8:25-8:30 Welcome
- Session 1: Topic: Instrumentation and Fabrication*
Chair: Michel Pioro-Ladrière (Université de Sherbrooke)
- 8:30-8:55 J.P.G. van Dijk (Delft University of Technology)
Trade-offs in engineering a scalable cryogenic controller for solid-state spin-qubits
- 9:00-9:25 Jeffrey Wright (HRL)
Design of Superconducting Gates for Si/SiGe Quantum Dot Devices
- 9:30-9:55 A. N. Ramanayaka (NIST)
Alternative method for interconnecting STM written quantum electronic devices
- 10:00-10:25 B. Patra (Delft University of Technology)
Cryogenic frequency synthesis for qubit control: Analysis and Design
- 10:30-11:00 BREAK
- Session 2: Topic: Donors*
Chair: Belita Koiller (Universidade Federal do Rio de Janeiro)
- 11:00-11:25 S. Asaad (University of New South Wales)
Quantum chaos and multi-qubit operations within a single 123-Sb donor in silicon

- 11:30-11:55 A. J. Sigillito (Princeton University)
All-electric control of donor nuclear spins in silicon
- 12:00-12:25 Yu-Ling Hsueh (Purdue University)
Spin-relaxation mechanisms of donors in Si in a nano-electronic device
- 12:30-2:15 LUNCH Auditorium
- 1:30-2:15 Roundtable:
Future of silicon quantum electronics (I)
participants: Malcolm Carroll (chair), Andrew Dzurak, Jason Petta, Seigo Tarucha, Maud Vinet
- Session 3: Topic: MOS Structures*
Chair: HongWen Jiang (University of California Los Angeles)
- 2:20-2:45 Pascal Lemieux (Université de Sherbrooke)
Quantum dots built in 28 nm FD-SOI advanced CMOS technology
- 2:50-3:15 Ryan M. Jock (Sandia National Laboratory)
Probing low noise at the MOS interface with a spin-orbit singlet-triplet qubit
- 3:20-3:45 M. A. Fogarty (University of New South Wales)
High-fidelity singlet-triplet readout and exchange control of spin qubits in a silicon-MOS double quantum-dot
- 3:50-4:15 Lotte Geck (Forschungszentrum Jülich)
Interfacing qubits: Cryogenic control electronics
- 4:20-4:40 BREAK
- 4:40-5:45 Poster session (Rooms 117 and 120)
- 5:50 Buses depart for hotels
Dinner on your own

Saturday, August 19, 2017

- 8:00 Buses depart from hotels to Jones Farm Conference Center
Continental breakfast provided at Jones Farm Conference Center

- Session 4: Topic: Single Dots and Wires*
Chair: Floris Zwanenburg (University of Twente)

- 8:30-8:55 M. Möttönen (Aalto University)
High-precision transport of single electrons using a silicon quantum dot
- 9:00-9:25 J. Ridderbos (University of Twente)
Hard superconducting gap in Ge/Si core/shell nanowires
- 9:30-9:55 A. Crippa (CEA, INAC-PHELIQS, Grenoble)
Electric Dipole Spin Resonance for electrons in a silicon quantum dot
- 10:00-10:25 J. Yoneda (RIKEN)
Charge-noise-limited coherence and three-nines fidelity of an enriched Si/SiGe spin qubit
- 10:30-11:00 BREAK
- Session 5: Topic: Multiple Dots
Chair: Kohei Itoh (Keio University)*
- 11:00-11:25 T. Watson (Delft University of Technology)
A programmable two-qubit quantum processor in silicon
- 11:30-11:55 M. Russ (University of Konstanz)
Synchronized high-fidelity quantum gates in Si/SiGe Double Quantum Dots
- 12:00-12:25 D. M. Zajac (Princeton University)
Coherent Spin Manipulation in a Si/SiGe Double Quantum Dot
- 12:30-2:15 LUNCH Rooms 118; 120; 121; 122
- Session 6: Topic: Qubits and Materials
Chair: Lloyd Hollenberg (University of Melbourne)*
- 2:20-2:45 Charles Tahan (Laboratory for Physical Sciences)
The case for always-on, exchange-only spin qubits
- 2:50-3:15 D. Sabbagh (Delft University of Technology)
High mobility in thin-oxide Si/SiGe field-effect transistor on 300 mm Si wafers
- 3:20-3:35 BREAK
- 3:35-4:40 Poster session (Rooms 117 and 120)

4:45 Buses depart for hotels
5:30 Buses depart from hotels to banquet cruise

Sunday, August 20, 2017

8:00 Buses depart from hotels to Jones Farm Conference Center
Continental breakfast provided at Jones Farm Conference Center

*Session 7: Topic: Imaging and manipulation of bottom-up devices
Chair: Stephen Lyon (Princeton University)*

8:30-8:55 Alex Kölker (London Centre of Nanotechnology)
Non-destructive imaging of atomically-thin nanostructures buried in silicon

9:00-9:25 L. Kranz (University of New South Wales)
Coherent electron spin control in atomically precise donor systems

9:30-9:55 B. Voisin (University of New South Wales)
Quantum tunneling microscopy of an atomic scale device in silicon

10:00-10:25 T. V. Pavlova (A.M. Prokhorov General Physics Institute, RAS)
Precision arrangement of phosphorus atoms on Si(100) through chlorine mask

10:30-11:00 BREAK

*Session 8: Topic: Charge Effects
Chair: Jill Miwa (Aarhus University)*

11:00-11:25 X. Mi (Princeton University)
Achieving the Strong-Coupling Regime with Cavity-Coupled Si Double Dots

11:30-11:55 J. M. Taylor (Joint Quantum Institute)
Towards quantum dot architectures: resonators and auto-tuning

12:00-12:25 Aleksey Andreev (Hitachi Cambridge Laboratory)
Long decoherence time in Silicon Isolated Double Quantum Dot charge qubits at 4.2 K

12:30-2:15 LUNCH Rooms 118; 120; 121; 122

- 1:30-2:15 Roundtable:
 Future of silicon quantum electronics (II)
 participants: James Clarke (chair), Andrea Morello, Michelle Simmons,
 Lieven Vandersypen, Amir Yacoby
- Session 9: Topic: Spin-orbit and Valleys*
 Chair: Maria Jose Calderon (ICMM-CSIC, Madrid)
- 2:20-2:45 X. Hu (Buffalo)
 Two-hole spin resonance and spin-orbit coupling in a silicon metal-oxide-
 semiconductor field-effect transistor
- 2:50-3:15 Samuel F. Neyens (University of Wisconsin)
 Measurements of valley splitting in novel Si/SiGe heterostructures
- 3:20-3:45 J. C. Abadillo-Uriel (ICMM-CSIC, Madrid)
 Fully tunable coherence and control of acceptor qubits in Si
- 3:50-4:15 BREAK
- 4:15-5:40 Poster session (Rooms 117 and 120)
- 5:45 Buses depart for hotels
- 6:30 Buses depart from hotels to downtown Portland

Monday, August 21, 2017

- 5:30am Buses depart from hotels for eclipse viewing (destination: Western Oregon
 University in Monmouth, OR)
- ~11am Buses depart from Monmouth, OR (2 buses to Hillsboro hotels, 1 bus to Portland
 airport)