Program

12Dec2013

1:00 PM  **Introductory remarks** [Baker, government panel]

1:10 PM  **MURI Overview** [Spielman]

1:15 PM  **Cascadable gates / Fermions.** We realized 1D solitons in a unitary atomic Fermi gas. [Zwierlein, Chuang]

1:45 PM  **Interfacing to optoelectronics.** Atomtronic devices and circuits must interact with conventional circuitry. We assembled a fiber pulling system based on high-precision computer controlled translation stages and have demonstrated pulled fibers with near unit transmission and developed techniques for coupling between different fiber modes. [Rolston]

2:15 PM  **Devices far from equilibrium I.** In the past year, we began experiments on a double-well lattice to create and study meta-stable AF order in Bose systems. [Porto Postdoc (R. Wyllie), Zwierlein]

2:45 PM  **Cold-atom closed circuits.** We will demonstrate atomtronic closed circuits and circuit elements using static and time-dependent potentials created by light. We created a toroidal-shaped Bose-Einstein condensate using an all-optical trap and implemented a moving barrier; we are studying the effects of a rotating barrier on a stationary condensate. [Campbell, Phillips, Clark]

3:15 PM  **Coffee Break**

3:30 PM  **Spintronics with atoms.** The spin of ultracold atoms provides much greater flexibility than is the case for electrons: atoms can have many more than two internal “spin” states, and the coupling between different spin states is under experimental control. [Das Sarma / Galitski Postdoc (K. Kechedzhi), Clark, Quraishi, Spielman]

4:45 PM  **Ultracold spin-orbit coupled matter.** Ultracold bosons with spin-orbit coupling assemble themselves into exotic quantum crystals and classical crystals. [Demler Postdoc (S. Gopalakrishnan)]

5:15 PM  **Day 1 Closing** [Spielman]

5:20 PM  **Government Caucus** [private]

5:25 PM  **Discussion with team** [Government, MURI team]
Program

13Dec2013

9:00 PM  **Opening** [Baker, Spielman]

9:05 AM  **Interfacing to optoelectronics.** Atomtronic devices and circuits must interact with conventional circuitry. We assembled a fiber pulling system based on high-precision computer controlled translation stages and have demonstrated pulled fibers with near unit transmission and developed techniques for coupling between different fiber modes. [*Rolston group (J. Lee and J. Hoffman)*]

9:50 AM  **Invited guest.** Title TBD: [V. Scarola]

10:35 AM  **Coffee Break**

10:50 AM  **Devices far from equilibrium.** Conventional electronic circuits relax rapidly due to strong coupling to a thermal environment; in contrast, atomic systems can be prepared far from thermal equilibrium with little coupling to the environment. In the past year we developed techniques to create and study meta-stable AF order in Bose systems. [*Demler group (K. Agarwal), Porto group (S. Koller)*]

12:20 PM  Lunch and discussion

1:15 PM  **Cascadable gates / Fermions.** We have observed solitons in a unitary Fermi gas, an aspect of dynamics in many classes of ultracold atomic materials. [*Zwierlein group*]

2:00 PM  **Spintronics with atoms.** We have recently observed spin-orbit coupling in a three-level system, going beyond the usual paradigm of SOC in electronic systems. [*Spielman group (S. Sugawa, 3-state team), Clark group (B. Anderson), Galitski group / Das Sarma group (J. Radic), Quraishi group (P. Kunz)*]

4:15 PM  **Coffee Break**

4:30 PM  **Cold-atom closed circuits.** We will demonstrate atomtronic closed circuits and circuit elements using static and time-dependent potentials created by light. We created a toroidal-shaped Bose-Einstein condensate using an all-optical trap and implemented a moving barrier; we are studying the effects of a rotating barrier on a stationary condensate. [*Campbell group (S. Eckel)*]

5:15 PM  **Day 2 Closing** [Spielman, Baker]

5:20 PM  **Meeting with team if required**