

US-Korea joint workshop on quantum information

2014.9.25

Purpose

This a joint US-Republic of Korea workshop on quantum information science and supporting technologies aimed at fostering potential US-Republic of Korea collaboration in basic research.

Venue

- Web site: <http://www.nist.gov/pml/div684/us-korea-workshop.cfm>
- When: Nov. 17th - Nov. 19th, 2014
- Where: LA
- Registration fee: \$485
- Hotel: Hilton at LA Airport (\$140/night)
 - <http://www3.hilton.com/en/hotels/california/hilton-los-angeles-airport-LAXAHHH/index.html>

Participants

- US side
 - NIST
 - Duke Univ.
 - JQI
 - MIT
- Korea side
 - SKT
 - KRISS
 - KIST
 - KAIST
 - ETRI
 - Korea Univ.
 - Univ. of Seoul
 - Wooriro

PROGRAM

Monday November 17, 2014

3:00pm – 3:30pm: Get together with Coffee

3:30pm – 4:00pm: Opening (Chair: Chang-Hee Lee)

Carl J. Williams, Chief, NIST

Soon-Kwon Kim, Deputy Director, MSIP

Yong-Jae Steven Rim, CP, IITP

4:00pm – 4:40pm: **Se Jin Park**, KRISS, *KRISS's activities in Quantum Measurement/Information*

QUANTUM COMMUNICATION I (Chair: Carl Williams)

4:40pm – 5:15pm **Franco Wong**, Prof., MIT, *Photon-efficient quantum key distribution using time-energy entanglement with high-dimensional encoding*

5:15pm – 5:50pm **Taehyun Kim**, Ph.D., SKT, *Progress in the development of the quantum repeater based on ion trap technology at SK telecom*

5:50pm Dinner (separate)

Tuesday November 18, 2014

QUANTUM COMPUTING (Chair: SoonChil Lee)

8:00am – 8:30am Continental Breakfast

8:30am – 9:05am **Jung-Sang Kim**, Prof., Duke University, *Distributed Quantum Networks based on Trapped Ions*

9:05am – 9:40am **Chris Monroe**, Prof., JQI, *Scaling the Ion Trap Quantum Computer*

9:40am – 10:15am **Doyeol Ahn**, Prof., Univ. of Seoul, *Quantum bit based on intervalley splitting and quantum gate model in Si quantum dot structures*

10:15am – 10:50am **J.H. Shin**, Ph. D., Korea Univ., *Some progress in entanglement-assisted quantum error correcting codes*

10:50am - 11:20am Break

QUANTUM INFORMATION (Chair: Taehyun Kim)

11:20am – 11:55am **Jacob Taylor**, Prof., NIST/JQI, *Quantum optics solutions to quantum Information challenges*

11:55am – 12:30pm **Sang Wook Han**, Ph. D., KIST, *Research status of practical plug and play MDI QKD*

12:30pm – 2:00pm Lunch

QUANTUM MEASUREMENT I (Chair: Jacob Taylor)

2:00pm – 2:35pm **John Teufel**, Ph. D., NIST, *Parametric amplifiers in the microwave beyond the standard quantum limit*

2:35pm – 3:10pm **James Trey Porto**, Ph.D., NIST, *Non-equilibrium magnetization dynamics in optical lattices*

3:10pm – 3:45pm **JongChul Mun**, Ph. D., KRISS, *Precision measurement using ultracold atomic gas*

3:45pm – 4:20pm **Yonuk Chong**, Ph. D., KRISS, *Quantum state measurement and spectroscopy in superconducting 3D transmon qubit*

4:20 pm – 4:50 pm Coffee Break

QUANTUM MEASUREMENT II (Chair: Yonuk Chong)

4:50pm – 5:25pm **Yi-Kai Lu**, Ph. D., NIST, *Tamper-Resistant Cryptographic Hardware in the Isolated Qubits Model*

5:25pm – 6:00pm **Hee Soo Park**, Ph. D., KRISS, *Measurement of high-dimensional quantum state utilizing photonic path qubits*

6:00 pm Dinner (separate)

Wednesday November 19, 2014

RELATED DEVICES (Chair: James Trey Porto)

- 8:00am – 8:30am Continental Breakfast
- 8:30am – 9:05am **Michael Stewart**, Ph. D., NIST, *Silicon based quantum devices*
- 9:05am – 9:40am **S.C. Lee**, Prof., KAIST, *Observation of quantum state of P nuclear spin in Si:P by double resonance*
- 9:40am – 10:15am **Sae Woo Nam**, Ph.D., NIST, *Single photon and photon counting detectors*
- 10:15am – 10:50am **Chan Yong Park**, CTO/VP, Wooriro OTC, *Fabrication of InGaAs/InP avalanche photodiode and application to single photon detection*
- 10:50am – 11:20am Break

QUANTUM COMMUNICATION II (Chair: June-Koo Rhee)

- 11:20am – 11:55am **Joshua Bienfang**, Ph. D., NIST, *Low noise, high-speed telecom compatible detectors for quantum communications*
- 11:55am – 12:30pm **Bob Jeongsik Cho**, Ph.D., SKT, *ATCA platform based Quantum Cryptography System Prototype for Commercialization*
- 12:30pm – 2:00pm Lunch

QUANTUM COMMUNICATION III (Chair: Jeongsik Cho)

- 2:00pm – 2:35pm **Scott Glancy**, Ph. D., NIST, *Quantum Information and Statistics at NIST Boulder*
- 2:35pm – 3:10pm **Chang-Hee Lee**, Prof., KAIST, *QKD for point to multipoint networks*
- 3:10pm – 4:10pm Discussion for collaboration