

## Quantum Communication

Tuesday August 28, 2012

- 8:00–8:30 *Check-In/Light Breakfast (Hosted by IPAM)*
- 8:30 *Session I - Introduction*
- 8:30–8:40 *<b>Welcome:</b> Russel Caflisch (Institute for Pure and Applied Mathematics)*
- 8:40–8:55 *<b>Purpose of Meeting:</b> Carey Schwartz (Office of Naval Research)*
- 8:55–9:25 **Carey Schwartz** (Office of Naval Research)  
*Navy Perspective*
- 9:35 *Session II - QKD and Optical Communications*
- 9:35 *Session Chair: Hamid Hemmati (Jet Propulsion Laboratory)*
- 9:35–10:15 **Richard Hughes** (Los Alamos National Laboratory)  
*Free-space QKD*
- 10:25–10:55 *Break*
- 10:55–11:25 **Dirk Englund** (Columbia University)  
*High-Speed Quantum Key Distribution Using Integrated Photonics*
- 11:35–12:05 **Don Boroson** (MIT Lincoln Laboratory)  
*Free-Space Optical Communication*
- 12:15–1:15 *Lunch (on your own)*
- 1:15–1:45 **Morio Toyoshima** (National Institute of Information and Communications Technology (NICT))  
*Demonstrations on Space Laser Communications in Japan*
- 1:55–1:15 *Session III - Sources and Detectors*
- 1:55 *Session Chair: Jane Nordholt (Los Alamos National Laboratory)*
- 1:55–2:25 **Franco Wong** (Massachusetts Institute of Technology)  
*Entanglement Sources for High-Speed QKD*
- 2:35–3:05 **Angelo Gulinatti** (Politecnico di Milano)  
*Single Photon Avalanche Diodes*
- 3:15–3:45 *Break*

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- 3:45–4:15     **Eric Dauler** (MIT Lincoln Laboratory)  
*Superconducting Single Photon Detectors*
- 4:25            *Day 1 Wrap Up*
- 4:25            *Moderator: Thomas Chapuran (Applied Communication Sciences)*
- 4:25–5:55     *<b>Discussion:</b> Technology Needs for Free-space QKD*
- 6:00–7:00     *Reception (Location: IPAM Lobby)*

### **Wednesday August 29, 2012**

- 8:00–8:30     *Continental Breakfast*
- 8:30            *Session IV - Security*
- 8:30            *Session Chair: Vadim Makarov (Institute for Quantum Computing)*
- 8:30–9:00     **Renato Renner** (Swiss Federal Institute of Technology of Zurich)  
*Towards Security Proofs for Practical Quantum Cryptography*
- 9:10–9:40     **Norbert Lütkenhaus** (Institute for Quantum Computing)  
*Security of Practical QKD Links and Networks*
- 9:50–10:20    *Break*

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- 10:20            *Session V - Secure Communication*
- 10:20            *Session Chair: Richard Hughes (Los Alamos National Laboratory)*
- 10:20–10:50    **John Smolin** (IBM Systems and Technology Group)  
*Quantum Information Theory and Cryptography*
- 11:00–11:30    **Prem Kumar** (Northwestern University)  
*Technology and Novel Protocols for Quantum Noise Protected Communication*
- 11:40–12:10    **Gerd Leuchs** (Friedrich-Alexander-Universität Erlangen-Nürnberg)  
*Continuous polarization variable QKD*
- 12:20–1:20     *Lunch (on your own)*
- 1:20–1:50      **Wolfgang Tittel** (University of Calgary)  
*Proof-of-Principle Demonstration of QKD Immune to Detector Attacks*
- 2:00            *Session VI - Quantum Communication*
- 2:00            *Session Chair: Wolfgang Tittel (University of Calgary)*
- 2:00–2:30      **Rupert Ursin** (Universität Wien)  
*Free-Space Quantum Communication Over 143 km Towards Space*
- 2:40–3:10      **Paul Kwiat** (University of Illinois at Urbana-Champaign)  
*Quantum Random Number Generators A bunch of BS (beamsplitters...)*
- 3:20–3:50      *Break*
- 3:50            *Day 2 Wrap Up*
- 3:50            *Moderator: Norbert Lütkenhaus (Institute for Quantum Computing)*
- 3:50–5:20      *<b>Discussion:</b> QKD Security, Alternative for Secure Communication*

## **Thursday August 30, 2012**

- 8:00–8:30      *Continental Breakfast*
- 8:30            *Session VII - Atmospheric Propagation*
- 8:30            *Session Chair: Baris Erkmen (Jet Propulsion Laboratory)*
- 8:30–9:00      **Jeffrey Shapiro** (Massachusetts Institute of Technology)  
*Optical Communication through Atmospheric Turbulence: Classical and Quantum*
- 9:10–9:40      **Gregory Mooradian** (QinetiQ)  
*Undersea Optical Communications*
- 9:50–10:20    *Break*

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10:20            *Workshop Wrap Up*

10:20            *Moderator: Jeffrey Shapiro (Massachusetts Institute of Technology)*

10:20–11:50    *<b>Discussion:</b> The Road Ahead - System Possibilities, Technical Challenges & Research Program Elements*

11:50–12:00    *<b>Closing Remarks:</b> Carey Schwartz (Office of Naval Research)*

12:00–12:10    *<b>Closing Remarks:</b> Russel Caflisch (Institute for Pure and Applied Mathematics)*

