



SINGLE PHOTON
WORKSHOP 2017

July 31 – August 4, 2017

Boulder, Colorado

Program Overview & Summary

MONDAY: JULY 31, 2017

8:00	Registration open ¹
8:50	<i>Welcome</i>
9:10	Metrology I
10:20	<i>Coffee Break</i>
10:50	Applications I
12:00	<i>Lunch</i>
13:30	Detectors I
15:00	<i>Coffee Break</i>
15:30	Integration I
16:45	Reception & Poster Session
19:15	<i>End</i>

TUESDAY: AUGUST 1, 2017

8:30	Applications II
10:00	<i>Coffee Break</i>
10:30	Metrology II
12:00	<i>Lunch</i>
13:20	<i>Exhibit-Only Time</i>
14:20	Sources I
15:10	<i>Coffee Break</i>
15:40	Sources II
17:10	<i>End</i>
19:00-	Short lecture course⁴
21:30	<i>Single-photon metrology and its application to quantum technologies</i>

WEDNESDAY: AUGUST 2, 2017

8:30	Detectors II
10:00	<i>Coffee Break</i>
10:30	Applications III
12:00	<i>Lunch</i>
13:40	Integration II
14:30	<i>Group Picture, Coffee Break & Exhibit-Only time</i>
15:40	Metrology III
17:20	<i>End</i>
18:00 –	Conference Dinner, Boulder Casual:
21:00	<i>Food Trucks & Craft Beer</i>

THURSDAY: AUGUST 3, 2017

8:30	Quantum Measurements
10:00	<i>Coffee Break</i>
10:30	Imaging
12:00	<i>Lunch</i>
13:30	Sources III
15:00	<i>Coffee Break</i>
15:30	Detectors III
17:00	<i>Closing remarks</i>

FRIDAY: AUGUST 4, 2017

8:00	NIST lab tours pickup at UMC⁴
9:15	<i>Welcome</i>
9:30	Lab tours⁴
12:00	<i>Lunch²</i>
13:00-	<i>Single Photon Radiometry and</i>
15:30	<i>Discussion Forum on Few Photon Metrology^{3,4}</i>

¹The registration desk will be open throughout the workshop from 8:00 – 17:00.

²We will have buses back to the UMC for attendees leaving after lunch

³We will have buses back to the UMC for attendees attending the Single Photon Radiometry Forum

⁴Prior sign-up required. See [“Workshop Satellite Meetings”](#) section for more detail.

Monday: July 31, 2017

8:00	Registration open	
8:50	Thomas Gerrits Marla Dowell	<i>Welcome</i>
Metrology I		Alan Migdall
9:10	Carl Williams (Invited) <i>NIST-Gaithersburg</i>	<u><i>A Federal Perspective on Single Photon Metrology and Technology</i></u>
9:40	Ingmar Müller <i>PTB-Berlin</i>	<u><i>Bilateral Comparison of Calibration Methods for Photon-Counting Detection Efficiency between NIST and PTB using Superconducting Nano-wire Single Photon Detectors</i></u>
10:00	Christopher Chunnillall <i>NPL</i>	<i>Metrology for characterizing single photon technologies</i>
10:20 Coffee break		
Applications I		John Lehman
10:50	Alipasha Vaziri (Invited) <i>Rockefeller University</i>	<i>Visual Perception at the threshold</i>
11:20	Jeff Shainline <i>NIST-Boulder</i>	<u><i>Photonic signaling and superconducting detectors for large-scale neuromorphic computing</i></u>
11:40	Matt Shaw <i>JPL</i>	<i>Superconducting nanowire single photon detectors for deep space optical communication</i>
12:00 Lunch		
Detectors I		Marty Stevens
13:30	Robert Hadfield (Invited) <i>University of Glasgow</i>	<u><i>Infrared single-photon detection with superconducting nanowires</i></u>
14:00	Gabrielle Bulgarini <i>Single Quantum</i>	<u><i>Single-photon detection with near unity efficiency, ultra-high detection rates, and ultra-high time resolution</i></u>
14:20	Boris Korzh <i>JPL</i>	<u><i>Single photon detection with a system temporal resolution below 10 ps</i></u>
14:40	Prasana Ravindran <i>UMass-Amherst</i>	<u><i>Active Quenching of Superconducting Nanowire Single Photon Detectors</i></u>
15:00 Coffee break		<i>Sponsored by: Sumitomo Cryogenics of America</i>
Integration I		Rich Mirin
15:30	Hong Tang (Invited) <i>Yale University</i>	<u><i>Photon pair generation and detection on silicon chips</i></u>
16:00	Cale Gentry <i>University of Colorado</i>	<u><i>Single-chip source of photon pairs with integrated pump rejection</i></u>
16:20	Evan Meyer-Scott <i>University of Paderborn</i>	<u><i>A plug & play single photon source with high heralding efficiency, and application to purity-efficiency tradeoff under spectral filtering</i></u>
16:45-19:15	Reception & Poster Session	

Tuesday: August 1, 2017

Applications II		Chris Chunnillall
8:30	Andrew Shields (Invited) <i>Toshiba-Cambridge</i>	<i>A Universal Transmitter for Quantum Communications</i>
9:00	Morgan Weston <i>Griffith University</i>	Heralded quantum steering over a high-loss quantum channel
9:20	Catherine Lee <i>MIT</i>	<i>High-dimensional quantum state transfer over deployed fiber</i>
9:40	Christoph Simon <i>University of Calgary</i>	Single photons for quantum networks, macroscopic quantum effects, and neuroscience
10:00	Coffee break	Sponsored by: 
Metrology II		Malcom White
10:30	Stefan Kück (Invited) <i>PTB-Braunschweig</i>	Single-photon sources and detectors for quantum radiometry
11:00	Glenn Solomon <i>NIST/JQI</i>	<i>Simultaneous, full characterization of a single-photon state</i>
11:20	Vaigu Aigar <i>VTT</i>	Experimental demonstration of a predictable single photon source with variable photon flux
11:40	Beatrice Rodiek <i>PTB-Braunschweig</i>	Metrological realization of an absolute single-photon source based on a nitrogen-vacancy center in nanodiamond
12:00	Lunch	
13:20	Exhibit-Only Time	
Sources I		Krister Shalm
14:20	Jelena Vuckovic (Invited) <i>Stanford University</i>	Quantum Light Generation with Quantum Dot - Cavity QED systems
14:50	Carlos Antón <i>CNRS</i>	<i>Efficient single photon sources in the solid-state</i>
15:10	Coffee break	
Sources II		Krister Shalm
15:40	Lorenzo De Santis <i>CNRS</i>	Single-photon Fock-state filtering with an artificial atom
16:00	Maria Chekhova (Invited) <i>Max-Planck Institute</i>	Towards photon triplet generation through a direct cubic nonlinear effect
16:30	Mike Reimer <i>University of Waterloo</i>	New nanoscale source of bright entangled photon pairs
16:50	Gregor Weihs <i>University of Innsbruck</i>	Three Photons – Efficient and Interfering
Short lecture course		
19:00- 21:30	'Single-photon metrology and its application to quantum technologies' Course organized by the European Metrology Program for Innovation and Research project 'Optical metrology for quantum-enhanced secure telecommunication (14IND05)'	

Wednesday: August 2, 2017

Detectors II		Varun Verma
8:30	Karl Berggren (Invited) MIT	<i>Transmission-Line Superconducting Nanowire Single-Photon Detectors: Imagers and Coincidence Counters</i>
9:00	Félix Bussi�eres University of Geneva	<i>Amorphous MoSi SNSPDs with a low time jitter and a high detection efficiency</i>
9:20	Daniel Slichter NIST-Boulder	<i>UV-sensitive SNSPDs for integration in an ion trap quantum processor</i>
10:00 Coffee break		Sponsored by:  
Applications III		Oliver Slattery
10:30	Hugo Zbinden (Invited) University of Geneva	<i>Quantum-enabled applications</i>
11:00	Peter Bierhorst NIST-Boulder	<i>Device-Independent Random Number Generation with Photons</i>
11:20	Ivo Degiovanni INRIM	<i>Inferring the fairness of a quantum coin with a single (detected) toss</i>
11:40	Aitor Villar National U of Singapore	<i>Photons in space: a demonstration and a roadmap for satellite QKD</i>
12:00 Lunch		
Integration II		Thomas Gerrits
13:40	Dirk Englund (Invited) MIT	<i>Large Scale Photonic Integrated Circuits for Quantum Information Science and Machine Learning</i>
14:10	Sonia Buckley NIST-Boulder	<i>Low-temperature waveguide coupled Si LEDs and superconducting nanowire detectors</i>
14:30 Group Picture, Coffee break & Exhibit-Only time		
Metrology III		Ingmar M�uller
15:40	Sergey Polyakov NIST-Gaithersburg	<i>Characterizing single-photon detectors within a second-order model and beyond</i>
16:00	Hugo Ferretti University of Toronto	<i>Beating Rayleigh's Curse Using SPLICE</i>
16:20	Jean-Philippe MacLean University of Waterloo	<i>Experimental observation of ultrafast biphoton correlations with energy-time entanglement</i>
16:40	Animesh Datta University of Warwick	<i>New aspects of quantum-optical sensing: multiple parameters & covertness</i>
17:00	Ivan Burenkov NIST/JQI	<i>Quantum Coherent Spectrometer: frequency discrimination below the standard quantum limit</i>
18:00 Conference Dinner, Boulder Casual: Food Trucks and Craft Beer		

Thursday: August 3, 2017

Quantum Measurements		Omar Magana-Loaiza
8:30	Andrew White (Invited) <i>University of Queensland</i>	<i>Manifold single photons and their many uses</i>
9:00	Geoff Pryde <i>Griffith University</i>	<i>Unconditional shot noise limit violation in photonic quantum metrology</i>
9:20	Alex Jones <i>University of Oxford</i>	<u>Many-photon distinguishability and unambiguous characterization of multiport interferometers</u>
9:40	Michael Mazurek <i>University of Waterloo</i>	<u>Quantum-free state and measurement tomography</u>
10:00	Coffee break	Sponsored by: 
Imaging		Sae Woo Nam
10:30	Eric Fossum (Invited) <i>Dartmouth College</i>	<u>Photon-Number-Resolving Quanta Image Sensor</u>
11:00	Joshua Rapp <i>Boston University</i>	<u>Unmixing Signal and Noise for Photon-Efficient Active Imaging</u>
11:20	Davide Portaluppi <i>Politecnico di Milano</i>	<u>Monolithic CMOS SPAD array with gating, timing electronics and photon-coincidence detection for 3D-ranging</u>
11:40	Richard Younger <i>MIT-Lincoln Labs</i>	<i>Crosstalk Elimination in Infrared Geiger-mode Avalanche Photodiode Arrays</i>
12:00	Lunch	
Sources III		Alessandro Farsi
13:30	John Rarity (invited) <i>University of Bristol</i>	<u>Spins and photons</u>
14:00	Fumihiko Kaneda <i>University of Illinois</i>	<i>Memory-assisted time multiplexing for efficient multi-photon generation</i>
14:20	Morgan Mastrovich <i>University of Waterloo</i>	<u>Spectral manipulation of entangled photons with an upconversion time lens</u>
14:40	Till Weinhold <i>University of Queensland</i>	<u>Sub-Megahertz Linewidth Single Photon Source Suitable for Quantum Memories</u>
15:00	Coffee break	
Detectors III		Joshua Bienfang
15:30	Seth Bank (Invited) <i>University of Texas</i>	<u>Emerging Semiconductor Single Photon Counters</u>
16:00	Bernicy Fong <i>Excelitas Technologies</i>	<i>Transit time, timing jitter and time walk in SLiK APD – measurement and implication for single photon counting applications</i>
16:20	Alberto Gola <i>FBK, Trento</i>	<i>Overview of Silicon Photomultipliers Developed at FBK</i>
16:40	Hesong Xu <i>FBK, Trento</i>	<i>Detecting entangled photons using CMOS SPAD arrays</i>
17:00	Closing remarks	

Friday: August 4, 2017 NIST Lab Tours

8:00 NIST lab tours pickup at UMC

9:15 Welcome

9:30 Lab Tours

12:00 Lunch

Sponsored by:



13:00- CCPR WG-SP TG 11

Single Photon Radiometry and Discussion Forum on Few Photon Metrology

15:30 Stefan Kück (PTB) and
Dong-Hoon Lee (KRISS)