



## Quantum Communications and Quantum Imaging XXII (OP431)

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Quantum communications and quantum imaging are emerging technologies that promise great benefits beyond classical communications and classical imaging - as well as great challenges. The objective of this conference is to provide a forum for scientists, researchers, and system developers in both fields and encourage technology exchange between the quantum communication and quantum imaging research communities. Papers are solicited on the following and related topics:

### QUANTUM COMMUNICATIONS, QUANTUM INTERNET, AND QUANTUM INFORMATION

- quantum free-space and fiber optics communications and cryptography
  - quantum communications experimental demonstrations
  - quantum key distribution (QKD), entangled QKD, stochastic QKD, heralded QKD
  - quantum cryptography protocols
  - quantum probes
  - quantum communication security
  - quantum communications with orbital angular momentum (OAM) states
- quantum communication using entanglement
  - teleportation; continuous variable teleportation counter-factual quantum communications
  - Bell-state analyzer development
  - nonlinear crystal and nonlinear fiber use in generating and engineering entanglement
  - multiphoton and multiple-particle entangled states and entangled beams
  - continuous and pulsed laser sources of entangled photons
- fundamental properties of the photon
  - qubit physics
  - single and multi-photon physics
  - squeezed states
  - slow/trapped light and photons
  - amplification and transmission of photon holes
  - quantum wavefunctions & measurements
  - quantum probability
  - quantum bi-photon physics

- frequency and polarization entanglement
- atmospheric quantum communication, satellite, and technology applications
- quantum satellites, quantum cube satellites
- quantum UAV, drone, robot and aircraft research and applications
- atmospheric effects on quantum communications systems
- atmospheric quantum communication propagation experiments, theory, simulation
  - quantum computing with photons
  - optical/photonic/fiber quantum computing; novel quantum computing
  - photon chips
  - quantum storage, gates, and control
  - single-photon sources
  - quantum algorithms
  - fine-grained quantum computing; few-qubit quantum computing
  - quantum state engineering
  - quantum random number generation
- quantum information communication
  - information in a photon
  - quantum data compression
  - compressive sensing and compressive imaging with quantum information
  - nonclassical information from entangled states and non-entangled states
  - non-local measurements
  - quantum secret sharing
- quantum networks
  - atom-photon quantum networks
  - quantum repeaters, memories, switches
  - entanglement of distant quantum memories
  - distributed quantum computing
  - atom chips
  - atom-ion optics; multiphoton interference, multiparticle interference
  - storage of entangled photons
  - photon frequency conversion
  - loop-hole-free quantum teleportation.

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**QUANTUM IMAGING AND QUANTUM SENSING**

- quantum ghost imaging, ghost imaging
  - quantum imaging with entangled photons
  - quantum imaging with thermal light
  - incoherent light and solar light quantum imaging
  - quantum imaging in turbulence and obscurants
  - quantum imaging and satellites
  - color and multispectral quantum imaging
  - quantum imaging at diverse wavelengths
  - quantum imaging and quantum lithography: bi-photon photo resist
  - bi-photon and n-photon quantum imaging
  - quantum holography and quantum identification
  - quantum imaging resolution and superresolution
  - quantum imaging with sparsity constraints
  - quantum imaging noise reduction
  - quantum imaging for medical applications
  - quantum imaging using fluorescence
  - temporal and spatial quantum / ghost imaging
  - plenoptic quantum imaging
- nonlocal quantum imaging physics
  - quantum versus classical imaging physics
  - quantum imaging versus speckle imaging
  - uncertainty principle in quantum imaging
  - quantum interference; multiphoton interference
  - squeezed states
- quantum remote sensing; quantum sensors; quantum sources
  - quantum two-photon sensing and detection
  - single-photon and multiphoton detectors
  - quantum measurements using cameras
  - fast, sensitive cameras for quantum technology
  - quantum lidar and quantum ladar
  - new ways to make entangled photon and pseudo thermal sources for quantum imaging
  - quantum illumination
- quantum relativity, GPS, and metrology
  - quantum clock synchronization
  - quantum clocks in quantum coincidence measurements.

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Below are abstract submission instructions, the accompanying submission agreement, conference presentation guidelines, and guidelines for publishing in the Proceedings of SPIE on the SPIE Digital Library. Submissions subject to chair approval.

### Important dates

Abstracts due	7 February 2024
Registration opens	April 2024
Authors notified and program posts online	29 April 2024
Submission system opens for manuscripts and poster PDFs*	17 June 2024
Poster PDFs due for spie.org preview and publication	24 July 2024
Manuscripts due	31 July 2024
Advance upload deadline for oral presentation slides**	16 August 2024

\*Contact author or speaker must register prior to uploading

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### What you will need to submit

- Title
- Author(s) information
- Speaker biography (1000-character max including spaces)
- Abstract for technical review (200-300 words; text only)
- Summary of abstract for display in the program (50-150 words; text only)
- Keywords used in search for your paper (optional)
- Check the individual conference call for papers for additional requirements (i.e. extended abstract PDF upload for review or instructions for award competitions)

Note: Only original material should be submitted. Commercial papers, papers with no new research/development content, and papers with proprietary restrictions will not be accepted for presentation.

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- Visit the conference page: [www.spie.org/op431call](http://www.spie.org/op431call)
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- Follow the steps in the submission wizard until the submission process is completed

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- Submit a manuscript by the advertised due date for publication in the Proceedings of SPIE in the SPIE Digital Library
- Obtain funding for registration fees, travel, and accommodations
- Attend the meeting
- Present at the scheduled time

### Review and program placement

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