



# QCom(P) Workshop @ COMSNETS 2024

16th International Conference on COMMunication Systems & NETWORKS

January 3 - 7 | In-person Conference | Bengaluru, India

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## QCom(P): Workshop on Quantum Communication and Computing

### Call for papers:

The 20th century, often referred to as the information age, witnessed the first quantum revolution with the invention of transistors, superconducting levitation, atomic clocks, and superfluidity. There is a broad consensus that we are now at the cusp of a second quantum revolution, and that the 21st century will be even more disruptive with the development of new quantum technologies. Exploiting quantum resources such as superposition and entanglement, we can radically transform technologies from communication to computing. For instance, in the communication domain, quantum physics can offer the ultimate (information-theoretic) security; while for certain problems in computing, quantum computers can potentially offer speed-ups that are unattainable by their classical counterparts. The technological readiness levels of these offerings are improving so rapidly that some of them have already become commercially viable.

With the 2022 Nobel prize in Physics also acknowledging the importance of such technologies pivoted on quantum information science, the 16th edition of COMSNETS conference is perfectly suited to launch the International Workshop on Quantum Communication and Computing -- QCom(P). The aim of this workshop is to bring together quantum researchers, scientists, engineers, entrepreneurs, developers, students, practitioners, educators, and programmers, from both academia and industry, working in this field. In this context, the workshop also intends to bridge the gap between the academic research in quantum computing and communication, and the industrial requirements and developments in these topics. Prospective participants are invited to submit their research contributions in the form of articles, surveys, tutorials, work-in-progress reports, extended abstracts, etc. that range from breakthrough ideas to real-world applications. This workshop would enable participants to present and discuss their accepted submissions via contributed talks and poster presentations. QCom(P) features both experimental and theoretical presentations. This workshop also comprises keynote addresses and invited talks on areas deemed topical and of special interest to the attendees. Finally, the workshop, along with a dedicated industry session, aims to serve as a forum to exchange ideas, present new results, connect and foster collaborations.

### The topics of interest include but are not limited to:

- § Quantum information theory
- § Quantum communication and networks
- § Quantum cryptography and post-quantum cryptography
- § Quantum estimation and detection
- § Quantum computing models and quantum complexity theory

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- § Quantum algorithms for NISQ and beyond
- § Hybrid gate-annealer-classical computing
- § Software stacks, tools and programming languages for quantum-enhanced computing
- § Quantum machine learning and artificial intelligence
- § Quantum-enhanced optimization
- § Quantum simulations and quantum chemistry
- § Quantum-enhanced solutions for different applications and domains
- § Quantum error correction and fault-tolerant quantum computing
- § Hardware, platforms and architectures for quantum and hybrid computing
- § Networked & distributed quantum computing and sensing
- § Quantum for Blockchain and IoT
- § Benchmarking in the areas of quantum communication and computing
- § Quantum-inspired computing architecture

## Submission guidelines:

- Submissions must be no greater than 6 pages in length including all figures, tables, and references and must be a PDF file. A minimum number of 3 pages are required.
- Submissions must be original work that has not been previously published or under review at another conference or journal. Submissions are expected to articulate a non-technical, clear and insightful description of the main idea and results, their impact, and their importance.
- Reviews will be **double-blind**: authors name and affiliation should not be included in the submission.
- Submissions must follow the formatting guidelines as given on IEEE Website. Those that do not meet the size and formatting requirements will not be reviewed.
- All workshop papers (full papers - both regular and invited) will appear in conference proceedings and be submitted to IEEE Xplore as well as other Abstracting and Indexing (A&I) databases.
- All papers must be submitted as an Adobe Portable Document Format (PDF) document and uploaded through the QCom(P) Workshop submission site on EDAS.

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## Important Dates

Manuscript Submission Due: ~~27th October 2023 (AoE)~~ ~~3rd November 2023 (AoE)~~ **10th November 2023 (AoE) [Firm]**

Notification of Acceptance: 3rd December 2023

Camera-ready Submission: 10th December 2023

Workshop Date: 7th January 2024

Paper submission link: <https://edas.info/N31574>

## Technical Program Committee:

- **Alessio Avella**, Istituto Nazionale di Ricerca Metrologica (INRIM), Italy
- **Anindita Banerjee**, Centre for Development of Advanced Computing (C-DAC), India
- **Debajyoti Bera**, Indraprastha Institute of Information Technology (IIIT-D), India
- **Shantanav Chakraborty**, International Institute of Information Technology, Hyderabad (IIIT-H), India
- **Soumya Das**, Eindhoven University of Technology, Netherlands
- **Durga B Rao Dasari**, Max Planck Institute for Solid State Research, Germany
- **Syamsundar De**, Indian Institute of Technology (IIT) Kharagpur, India
- **Ivan Dmitrovic Derkach**, Technical University of Denmark (DTU), Denmark & Palacký University Olomouc, Czech Republic
- **Kaumudibikash Goswami**, University of Hong Kong
- **Raktim Halder**, Leibniz University Hannover, Germany
- **Pavithran Iyer**, Xanadu Quantum Technologies, Canada
- **Rajiv Krishnakumar**, QuantumBasel, Switzerland
- **Anirban Mukherjee**, Tata Consultancy Services (TCS) Research & Innovation, India
- **Arun Padakandla**, University of Tennessee, USA
- **Anjani Priyadarsini**, Amazon Web Services (AWS), India

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- **Shesha Raghunathan**, IBM, India
- **Ankur Raina**, Indian Institute of Science Education and Research (IISER) Bhopal, India
- **Anupama Ray**, IBM, India
- **Narayanan Rengaswamy**, University of Arizona, USA
- **Tirth Shah**, Q.ANT GmbH, Germany

## Keynote Speakers (tentatively confirmed):



**Ulrik Lund Andersen**

Professor, Technical University of Denmark (DTU), Denmark

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Ulrik Lund Andersen is a full professor in quantum optics and quantum information, heading the section for Quantum Physics and Information Technology (QPIT) and leading the Danish Center of Excellence on Macroscopic Quantum States (bigQ) from 2017. He is a member of the Quantum Community Network under the EU quantum flagship program. Over the course of his career, he has made a very broad range of significant contributions to quantum optics, technology, and information including the development of new techniques to generate, control and optimally measure non-classical states of light (Gaussian, non-Gaussian and entangled states).

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**Saikat Guha**

Professor, University of Arizona, USA

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Saikat Guha is a Peyghambarian Endowed Chair Professor of Optical Sciences at the University of Arizona. He is also the Director of the NSF Engineering Research Center for Quantum Networks (CQN). Saikat's research interests are in the quantum limits of optical communications and quantum-secured communications (rate) and optical sensing (resolution). He has also been lately interested in continuous variable photonic quantum computing, and quantum networks. He was one of the founding members of the Quantum Information Processing group at BBN, formed in 2009. Saikat received the Raytheon 2011 Excellence in Engineering and Technology Award, Raytheon's highest technical honor. He was a co-recipient of an honorable mention in NSA's 2016 Cybersecurity Best Paper Award for a paper on Quantum-Secure Covert Communication on Bosonic Channels, which he supervised. He was a recipient of Anita Jones Entrepreneurial Award 2013 from BBN Technologies, a co-recipient of a NASA Tech Brief Award for his work on Phase-conjugate receiver for Gaussian-state quantum illumination, and received the Raymie Stata Award for outstanding performance as Teaching Assistant for Signals and Systems, Fall 2005, from the Department of Electrical Engineering and Computer Science, MIT. Saikat was a member of India's first team to the International Physics Olympiad at Reykjavik in 1998, where he received an Honorable Mention and the European Physical Society (EPS) Award for the experimental component. He is a Senior Member of the IEEE.

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**Christoph Marquardt**

Professor, Max-Planck-Institute for the Science of Light, Erlangen, Germany

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Christoph Marquardt owns the Chair of Optical Quantum Technologies at the Friedrich-Alexander-Universität Erlangen-Nürnberg and is the head of the quantum information processing group at the Max Planck Institute for the Science of Light in Erlangen. The topics of his research cover a broad range of quantum optics and quantum information experiments, from nonlinear photonics to satellite-based quantum key distribution. Christoph Marquardt served in advisory groups for the European Union and German government and is a co-founder of the start-up KEEQuant. He is active in several EU and national quantum communication research projects and is taking care of the architecture of the German BMBF QuNet initiative on quantum key distribution.



**Urbasi Sinha**

Professor, Raman Research Institute (RRI), India

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Urbasi Sinha is a full professor and head of the Quantum Information and Computing (QulC) laboratory at the Raman Research Institute (RRI) in Bangalore, India. She is a Simons Emmy Noether Fellow at the Perimeter Institute, Canada as well as an associate faculty member at the Institute for Quantum Computing (IQC), University of Waterloo, Canada, and the Centre for Quantum Information and Quantum Control, University of Toronto, Canada. Her lab at RRI specializes in experiments on photonic quantum information processing including quantum computing and quantum communication, primarily using single and entangled photons. She is heading India's first project on satellite-based secure quantum communications. Her scientific recognitions include the Homi Bhabha Fellowship in the year 2017, the 2018 ICTP-ICO Gallieno Denardo Award in Optics, being recognized as one of Asia's Top 100 scientists by the Asian Scientist for the year 2019 as well as the Simon's Emmy Noether Fellowship at the Perimeter Institute, Canada. In August 2020, she led the two-member winning team as a mentor, at the World Skills International Competition in Quantum Technology at the BRICS Future Skills Challenge, organized by the Russian Quantum Centre in Moscow, Russia with competitors from several countries worldwide. She won the ASSOCHAM Women in Cyber: Making a Difference award in the category "Cyber - Leading from the front" in 2021. Recently, she has been awarded the prestigious 26th SIES Chandrasekarendra Saraswathi National Eminence award for the year 2023 in the domain of science and technology.

## Workshop co-chairs:



M Girish Chandra  
TCS Research, India



Sourav Chatterjee  
TCS Research, India



Nitin Jain  
Technical University of  
Denmark, Denmark

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Maharshi Ray  
Mie University, Japan



Kaushik P. Seshadreesan  
University of Pittsburgh,  
USA

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