

IEEE Communications Society Quantum Communications and Information Technology - ETC (QCIT-ETC)

Meeting at Globecom 2021

Room: *Virtual*

**Date/Time: November 30, 2021, 9am – 11am EDT
Madrid, Spain**

Mission

The Emerging Technical Committee (ETC) on Quantum Communications and Information Technology (QCIT) promotes all types of communications theory and engineering to foster quantum technology. Our field of interests start from the basic radio frequency technology, addresses aspects of control instrumentation, error correction, coding theory, system architecture, simulation, algorithms, and eventually applications. The committee will connect people from Industry and Academia by supporting conferences, symposia, technical sessions, publications, etc., where information is exchanged within the scope of interest of the QCIT-ETC.

Meeting Agenda

1. Welcome and Opening
2. Invitation to IEEE Quantum Week 2022
3. QCIT Talks
4. Approval of Previous Meeting Minutes
5. Report on ETC Meeting
6. Report on Workshops & Conferences
7. Report on Tutorials, Keynotes & Invited Talks
8. Report on Publications & Future Events
9. Standards Liaison
10. New Business Items
11. Next QCIT-ETC Meeting
12. Adjourn

1. Welcome / Introduction I

QCIT-ETC Officers

Chair: Lajos Hanzo (University of Southampton, UK)

Vice-Chair: Peter Mueller (IBM Zurich Research Lab, Switzerland)

Secretary: Andrea Conti (University of Ferrara, Italy)

Standards and Media: Michael Ng (University of Southampton, UK)

Membership: 450+

1. Welcome / Introduction II

The QCIT-ETC website:

- <http://qcit.committees.comsoc.org/>

- Two mail distribution lists:

- qcit@comsoc.org

Internal announcements only

ICC, Globecom, Committee meetings like today, Awards

- qcit-announce@comsoc.org

CFP email distribution list

Open to all signed-up members to distribute QCIT related CFPs

Sign-up: Send “ join QCIT(-ANNOUNCE)” message to list@comsoc.org

Unsubscribe: Send “SIGNOFF QCIT” message to list@comsoc.org

2. IEEE Quantum Week 2022

Invitation to IEEE Quantum Week 2022 by General Chair Prof. Greg Byrd

3. QCIT Talks

- Prof. Pascal Vontobel, The Chinese University of Hong Kong
“Tutorial on a graphical-model-based approach to quantum information processing”

Abstract - The aim of this presentation is to give an introduction to a post-graduate course on quantum information processing (QIP) that we taught earlier this year and whose course materials (lecture slides, homework assignments, and lecture videos) are available here:

https://sites.google.com/site/pascalvontobel/qip_course

A special feature of this QIP course is that it uses, as far as possible, graphical models. This allows for a unified and more accessible treatment of various topics, along with highlighting the differences between classical and quantum information processing. (The graphical models that are used are very similar to tensor networks. However, one advantage of the graphical models that are used is that they are compatible with graphical models used in classical information processing.) This QIP course is designed to be accessible to a broad audience. Therefore, we only require a solid understanding of linear algebra, classical probability theory, and complex numbers. Relevant background from quantum physics, graphical models, information theory, etc., are introduced as necessary to make this course as self-contained as possible.

In the first part of this presentation, we will discuss some of the "highlights" of this QIP course; in the second part, we will discuss some of the underlying technical details.

4. Approval of Previous Meeting Minutes

The most recent QCIT meeting was held at IEEE ICC 2021.

The meeting minutes/slides are published on the QCIT URL (use tab “Meetings”):

<http://qcit.committees.comsoc.org/>

5. Report on ETC-TAC Meeting

Nothing relevant before this meeting

6. Report on Workshops & Conferences

Since last meeting:

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7. Report on Keynotes & Invited Talks

Keynotes and Invited Talks reported in the minutes

Since the last meeting:

...

8. Report on Publications & Future Events

Please use the QCIT-ANNOUNCE distribution list to send your CFPs and report your special issues, book chapters, and so on.

QCIT is actually looking for a member who would be willing to serve in the position of an Appointed Representative of Publications. If you are interested, please contact the newly elected officers.

- The QCIT ETC has contributed to the formation of the new IEEE-level Open-Access journal, namely the IEEE TRANSACTIONS ON QUANTUM ENGINEERING;
- A new IEEE ComSoc Communications Magazine Special Section has been proposed and it is under consideration by the EIC;

9. Standard Liaison

The QCIT-ETC is supporting standards work within the field.

IEEE SA - 1913 - Software-Defined Quantum Communication

<http://standards.ieee.org/develop/project/1913.html>

IEEE SA - 1913 - Software-Defined Quantum Communication IEEE.org IEEE Xplore Digital Library IEEE Standards...

Liaison: [Steven Bush \(bushsf@research.ge.com\)](mailto:bushsf@research.ge.com)

IEEE SA - 7131 - Standard for Quantum Computing Performance Metrics & Performance Benchmarking

<http://standards.ieee.org/develop/project/7131.html>

IEEE SA - 7131 - Standard for Quantum Computing Performance Metrics & Performance Benchmarking IEEE.org IEEE Xplore...

Liaison: Peter Mueller (pmu@zurich.ibm.com)

IEEE SA - 7130 - Standard for Quantum Computing Definitions

<http://standards.ieee.org/develop/project/7130.html>

IEEE SA - 7130 - Standard for Quantum Computing Definitions IEEE.org IEEE Xplore Digital Library IEEE...

Liaison: Peter Mueller (pmu@zurich.ibm.com)

10. New Business Items

The QCIT ETC is contributing to the IEEE-level Quantum Initiative:
<https://quantum.ieee.org/about>

NAE report <https://www.nap.edu/catalog/25196/quantum-computing-progress-and-prospects>

Worldwide Large Regional Programs

- US IARPA and others
- China Secure Backbone
- EU Flagship and Quanterra

European Efforts:

- European Flagship Program on Quantum Technologies

11. Next QCIT-ETC Meeting & Workshop

The next IEEE ComSoc's Quantum Communications and Information Technology ETC (QCIT-ETC) meeting will be held at

IEEE ICC 2020

12. Adjourn

Thank you for attending!