

IEEE FOOTHILL SECTION

Serving to Enhance the Community

(<http://www.ieee-foothill.org/>)

Monthly Newsletter

Upcoming Events

International Microwave Symposium

Live Stream Event: 4 - 6 August 2020
On Demand: 4 August - 30 September 2020
(<https://ims-ieee.org>)

Monthly Operations Committee Meeting

Aug. 11, 6:30 PM - 9:30 PM
(<https://csusb.zoom.us/j/93658392053>)

Buenaventura MTT-S Chapter: Rejuvenate Aging Eye with Presbyopic Implant in the Eye (PIE) by Rajesh Khanna

Aug. 16, 6:30 PM
(www.ieee-bv.org/flyer/2020-08-mtt)

DISTINGUISHED LECTURER WEBINAR SERIES: From Regulatory Compliance to Process Improvement in Healthcare

Aug 13, 11:00 AM - 12:00 PM
(<http://echo7.bluehornet.com/ct/55854866:JYmGz7bNp:m:1:2942340554:5C8E1996FB87BAB02DA59148CB89B63D:r>)

IEEE 5G World Forum

Sept. 10-12, 2020
(<https://connect.ieee.org/Xa30hHP0U000Hb37i03zGS0>)

Corporate Sponsorships

Panatron, Inc.
(<https://panatron.com/>)

We're looking for more corporate sponsors.

For information, please contact:

Section Chair David E. González

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Section Vice Chair Scott Wedge

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June Operations Committee Meeting



Section OpCom meeting for June was conducted via Zoom on June 9th, 2020. Meeting was called to order at 7PM and introductions were made for some new or recently new attendees in the Zoom session. Minutes from the previous monthly meeting were approved. Section Treasurer, William Smit, presented the 2019 Budget and was approved. The Section 2020 Budget Proposal is to be presented for approval at the next meeting.

Sections and Committees

Membership and Development - 883 members with one senior elevation, Dr. John Korah.

Professional Activities Committee for Engineers - looking into what's going on with PACE funding.

Educational Activities - application is open for Volunteer Online Training (VoLT) and looking into using Collabratec platform for communication and collaboration.

Newsletter and Webmaster - nothing much is going on, a lot of conferences are being delayed or converted to virtual due to COVID 19 and Section Chair, David Gonzalez, will spend some time to get the website updated.

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Student Sections

Students are on summer break and classes will still be all virtual for Fall.

California Polytechnic University, Pomona (CPP) - is looking into a possible online club fair with a Discord server set up.

California State University, San Bernardino (CSUSB)

- Computer Science and Engineering (CSE) Club had Officer Elections during their May virtual meeting and a Game Night on June 5th.

- Women in Engineering Club announced that WiE International Leadership Conference is virtual and free to all. They have members attending these talks and are planning to share the information with the CBU group. They also have a Minecraft server and are looking to get people to join build competition.

Technical Societies and Committees

Communication Society (ComSoc) - Virtual 5G/IoT presentation on Friday, June 12th, San Diego Section

Computer Society (CS) - Cyber Security Talk on June 10th and Gigabit Talk on June 25th by Scott Wedge.

Microwave Theory (MTT-S/APS) - IMS scheduled for Aug. 4-6, 2020, all virtual

- i. MTT members - Free
- ii. Student Members - \$100
- iii. IEEE Members - \$200
- iv. Non-members - \$350
- v. Free virtual exhibits

Nanotechnology (NanoTech) - still active and Section Treasurer is currently managing their available funding

Affinity Groups

Consultants Network (CN) - had a meeting on June 3rd and working on a conference in May 2021.

New Business

- Looking into opening up a Life Members Affinity group.

- Looking at creating an Aerospace and Electronic Systems Society (AES) chapter.

- Showed video about NavyX and Naval Surface Warfare Center.

MTTS/APS Activity Report

By: Ray Moreno

In June events

- Dr. Scott Wedge gave his technical presentation (topic covered in Computer Society report)
- Attended the MTTTS International Chapter Chair meeting

International MTTTS Chapter Chair meeting

Summary June 28th 2020

- Membership
- DML Program
- Education Program
- IMS Status
- Marketing
- Chapter Chair Overview

DML Diversity Actions (Discussion in Progress)

- Open up the process to allow for more nominations and equal opportunity
 - Lower the minimum required workload to be more in line with other societies
 - Double the number of DMLs to further increase content at same budget level
- Adjusted nomination process:
- Allow multiple nominations per TC and (direct) nominations by chapters
 - Allow self-nomination, consider previous (excellent) unselected nominees
- Adjusted requirements:
- 20 DMLs, 2 trips (5 talks), 5 virtual talks, same budget
 - Relax the requirement on MM articles that introduce chapter visit articles
 - Relax the requirement on webinar but strengthen SB program for more content

MarCom Role and Strategic Vision

MTT-S will enhance the recognition of the Society and the value of MHz-to-THz RF technologies to the engineering profession, advertisers/sponsors, MTT-S membership and to the IEEE/RF community at large.

2020 Initiative: Enablement of MTT-S Resource Center

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Microwave-enabled Quantum Computing

- Promise of Quantum Computing
- Qubit 101
- Challenges
 - Cold temperature (1 ~ 10 milli K)
 - QEC (qubit Error Detection and Correction)
- Quantum Computing Algorithms



Topics

- Promise of Quantum Computation
 - Qubits 101
 - Quantum Algorithms
 - Summary
- } Microwave enabled



Power of quantum computation (1)

EXPONENTIAL SCALING

$|\Phi\rangle = c_1|0\rangle + c_2|1\rangle$ One-qubit state, superposition in 2-dimensional space

$|\Phi\rangle = c_1|00\rangle + c_2|01\rangle + c_3|10\rangle + c_4|11\rangle$ Two-qubit state, superposition in 4-dimensional space

$|\Psi\rangle = c_1|000\rangle + c_2|001\rangle + c_3|010\rangle + c_4|011\rangle + c_5|100\rangle + c_6|101\rangle + c_7|110\rangle + c_8|111\rangle$

Three qubit states are superpositions in $2^3=8$ dimensions. **N qubits: superposition in 2^N dim space**

Number of particles in the universe $\sim 10^{80}$ $2^N \sim 10^{80} \Rightarrow N \sim 270$

With ~270 ideal qubits, there are more dimensions than atoms in the universe!

53 qubits were enough to demonstrate "quantum supremacy (or advantage)" by Google last year



Microwave-enabled Quantum Computing presented by Dr. David E. Root, IEEE Fellow, Keysight Technologies

Quantum Algorithms

QUANTUM INTERFERENCE AND AMPLITUDE AMPLIFICATION

Search: quadratically faster factoring: exponentially faster than any known classical

Note: not all quantum algorithms are probabilistic.

Slide courtesy MIT



MTTS/APS Plans

- What's Next
 - IMS is coming next month
 - Future speaker