



From the Editor's Desk

Educating Current and Future Microwave Engineers

■ Robert H. Caverly

Welcome to the November issue of *IEEE Microwave Magazine*. As I write this column, the closing ceremony of the 2020 Summer Olympics in Japan has just wrapped up. I enjoyed seeing two weeks of highly trained athletes compete in all of the sports, including major ones such as track and field and swimming, as well as events that are given coverage only every four years such as archery and table tennis.

The dedication of these athletes to their craft reminded me of the commitment microwave engineers have to theirs. Both require extensive training (equating training with education), with long hours spent working behind the scenes to be able to meet the future challenges posed to them.

Just as athletes reach plateaus in training that take extra effort to move beyond, microwave engineers reach certain points in their electromagnetics education that take more work to understand. In both cases, stronger foundations are built to allow for im-



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provements in performance until the next challenge or plateau is encountered. Just as all Olympic athletes do not win medals and not all microwave engineers gain recognition, it is the journey each of us takes to improve our skills and be a part of the community that provides its own intangible rewards.

This month's issue contains articles that help not only in our continued education but also with how education for the next generation of microwave engineers can be advanced. While this issue is not a traditional IEEE Microwave Theory and Techniques Society (MTT-S) technical committee focus

issue, we do have a general theme of filtering circuits for you to read.

The filter articles cover a range of topics, with the first by Shahid et al., "Periodic Structures for Reconfigurable Filter Design." This work looks at various periodic structures based on electronic bandgap (EBG) characteristics and then proceeds with a look at various realizations of reconfigurable EBG-based filters.

The second feature in the issue, authored by Mao et al., is "Filtering Antennas." Rather than treating antennas and filters as separate system blocks, the authors look at

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- 6) *TCFDC: 2022 3% Initiative* to support the new YP Affiliates Program by providing travel grants for YP TC Affiliate members. The MTT-S has recently started a TC affiliate initiative to significantly increase the number of YPs in its TCs. These committees meet in person at least once a year to discuss and organize technical activities. The initiative is to provide new TC Affiliate members with basic travel support when appropriate to attend these important TC meetings in person and enable the Affiliates to actively participate, network, and create novel MTT-S projects, content, and activities.
- 7) *Education Committee: 2022 3% Initiative* to create an MTT-S student newsletter to be published quarterly. The proposed newsletter builds on the excellent colorful articles published in *IEEE Microwave Magazine* to attract students to our field. The plan is to email this newsletter

not only to MTT-S student members but also to all MTT-S Chapter chairs so they can distribute them to students at their local universities. The newsletter will also include announcements of our MTT-S student awards and other MTT-S activities.

- 8) *Education Committee: 2022 3% Initiative* to establish the first year of the DMI program. Three to four half-day workshops are planned to be organized during 2022. In each half-day workshop, potentially about 1,000 students from four to five universities within similar time zones will attend. This program aims to inspire the interests of undergraduate students and encourage them to get involved in the RF/microwave community and to increase the impact of the MTT-S among undergraduate students.
- 9) *Operations Committee: 2022 3% Initiative* to create an MTT-S Virtual Historical Exhibit, comprising vid-

eos of physical MTT-S exhibits, edited video from analog tapes, voice-over commentary, and interviews with MTT-S members on the historical significance of the items. The virtual exhibit will be available on the MTT-S website, with each exhibit having a live video link.

The MTT-S is a very active IEEE Society. I encourage you to visit our website, www.mtt.org, for more information. If you would like to be involved as a volunteer in the MTT-S, fill out a contact form at www.mtt.org/connectme, and we will make sure you get connected.

References

- [1] G. Lyons, "Notable proceedings from MTT-S administrative committee meeting AM1 for 2021 [president's column]," *IEEE Microw. Mag.*, vol. 22, no. 6, pp. 10–14, June 2021. doi: 10.1109/MMM.2021.3064772.
- [2] "IEEE finance operations manual (FOM) V.48," https://www.ieee.org/documents/financial_ops_manual.pdf, section 2.B.6c.



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ways to merge the two into a single circuit block with unique characteristics. In the same vein as the first two technical features, we also offer an "Application Notes" column that looks at a specific application of filters in "Tunable Filters for Agile 5G New Radio Base Transceiver Stations" by Doumanis et al.

The final technical feature article is more focused on microwave education. As we all know, adjustments have had to be made during the pandemic to how and where work is performed, and academics have had to make changes as well in the pedagogy and delivery of courses in remote settings. As we are just finding out, some of these pandemic accommodations led to new ways of thinking that may stay in place even after restrictions are lifted.

In "Going Remote," Iyer et al. discuss in detail an approach to educating new microwave engineers using inexpensive but compact laboratory equipment to provide the needed measurement skills to reinforce conventional textbook approaches. I have used several of the described techniques in my microwave engineering classes and can attest to their efficacy, and the methods provide food for thought that could be applied to other topical areas.

Our columns this month feature the "President's Column," where the MTT-S Administrative Committee's second annual meeting (AM2) is reviewed as are initiatives for the next year. The popular press continues to discuss strange cases of embassy and other personnel health issues from what appear to be targeted energy systems; in this month's "Health Matters" column,

Dr. James Lin provides us with an update on the possible microwave origins of these negative health effects.

Our "MicroBusiness," "Microwave Surfing," and "Book/Software Review" columns are all in this issue, along with a "Speaker's Corner," where a novel design approach to traditional microwave circuits is presented. There is also an "In Memoriam" column about the life and career of Prof. Hristo Hristov, who passed away earlier this year.

We present a new "Enigma" challenge, along with the solution to last month's puzzle and, finally, the monthly conference calendar. As pandemic restrictions are being (somewhat) eased globally, continue to check the various conference websites to see the latest information on the conference modalities as well as other potential changes.

