



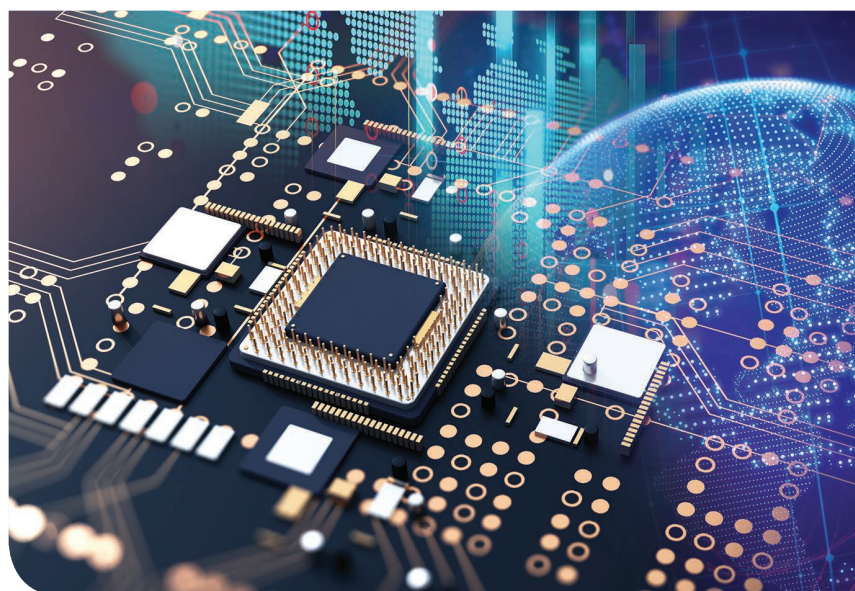
From the Editor's Desk

A Preview of the August Issue

■ Robert H. Caverly 

Even though the date on the cover of this issue of *IEEE Microwave Magazine* says August 2024, as I write this column, the 2024 International Microwave Symposium (IMS) is still a month away. However, I don't think I am risking much by saying that the conference was well attended and technically (and socially) engaging, with so many activities going on that one had to use care to pick and choose the ones to attend. Knowing many members of the organizational team for IMS 2024, I know they made those choices difficult, with all of the activities planned that were outlined in the 2024 May issue of *IEEE Microwave Magazine*. I also know you returned from IMS refreshed and ready to dive into new microwave engineering challenges.

We have three technical features and one "Application Notes" column for you this month. The first technical feature, by L. Liao et al. [A1], looks at a problem any IC or microstrip designer encounters, which is the need to provide crossover connections between



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two circuit points. The authors in this article look at two broad categories of crossover: microstrip crossovers based on couplers and crossovers based on multimode resonators. The authors discuss some crossover design techniques and then provide numerous examples. The next technical feature, by R. Amineh and N. Nikolova [A2], provides an overview and tutorial of Fourier-based methods for microwave and millimeter-wave (mm-wave) image

reconstruction, a discussion of their limitations, and some illustrative examples of recent applications. The third technical feature, by N. El-Hinnawy et al. [A3], was initially scheduled as part of the February 2024 *IEEE Microwave Magazine* focus issue on phase change material (PCM) devices but was unfortunately delayed in publication. The authors provide an extensive overview of PCMs used in a variety of RF and microwave applications and

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show performance metrics for current devices and circuits. This month's "Application Notes" column, by A. Sharma et al. [A4], focuses on dielectric subsystems at mm-wave frequencies that could deliver broadband data reliably at extremely high temperatures.

Starting off with this month's regular columns, the IEEE Microwave Theory and Technology Society (MTT-S) President Maurizio Bozzi reminds us of our vibrant MTT-S Technical Committees (TCs) and their organization [A5]. In addition to our community's traditional topical areas of interest, new technologies such as quantum computing and advanced semiconductors are being integrated into our TC structure, and Maurizio provides details on this integration. Fred Schindler talks about the differences among information, knowledge, and understanding and how they relate in the business world in his "MicroBusiness" column [A6]. All of us were (or maybe still are) students of one type, whether through formal or informal microwave education, and MTT-S is helping to support formal education through its Fellowship and Scholarship program. This month, the MTT-S Education Committee presents the winners of the 2024 Graduate Student Fellowship Awards. In this "Education News" column [A7], you can read about some of the cutting-edge research being done by our student members and their research advisors. In 2025, MTT-S will sponsor up to 12 graduate fellowships in the general category and two graduate fellowships in the medical applications area; the next application

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deadline is 15 October 2024. We also have two news items: One is a report on the activities in the last several years from the TC on Microwave/Millimeter-Wave Radar, Sensing and Array Systems (TC-24) [A8]. The other item, from our Membership and Geographic Activities (MGA) Committee, is on the activities in the West Bengal region of India [A9].

IEEE has a number of affinity groups that are defined as nontechnical subunits of one or more sections or a council as part of the MGA. Two of these affinity groups, Women in Engineering and Young Professionals (YP), are represented in MTT-S by our Women in Microwaves and YP committee members. This month, we have two reports from these groups. The "Women in Microwaves" column [A10] looks at a communication infrastructure project in Malaysia that had support from both professionals and the local amateur radio community. The "Young Professionals" column [A11] reviews the YP activities that were held at the 2023 IEEE Microwaves, Antennas, and Propagation Conference in Ahmedabad, India. Rounding out the issue, we have the solution to last month's "Enigmas, etc." challenge from Prof. T. Ohira [A12] and, of course, our "Conference Calendar" [A13] that provides you with a look ahead of the global MTT-S conference scene.

Enjoy the issue!

Appendix: Related Articles

- [A1] L. Liao, Z. Li, M. Qin, P. Liu, X. Qiu, and Z. Li, "A review of nonmultilayer planar crossovers," *IEEE Microw. Mag.*, vol. 25, no. 8, pp. 16–35, Aug. 2024, doi: [10.1109/MMM.2024.3356428](https://doi.org/10.1109/MMM.2024.3356428).

- [A2] R. Amineh and N. Nikolova, "Fourier-space image Reconstruction using microwave measurements," *IEEE Microw. Mag.*, vol. 25, no. 8, pp. 36–56, Aug. 2024, doi: [10.1109/MMM.2024.3403047](https://doi.org/10.1109/MMM.2024.3403047).
- [A3] N. El-Hinnawy, G. Slovin, K. Moen, C. Masse, and D. Howard, "A tale of two phases: An overview of phase-change material RF switch technology," *IEEE Microw. Mag.*, vol. 25, no. 8, pp. 57–76, Aug. 2024, doi: [10.1109/MMM.2024.3403288](https://doi.org/10.1109/MMM.2024.3403288).
- [A4] A. Sharma, C. Romero, and Y. Rod Kim, "Millimeter-wave ceramic antennas and fibers for extremely high-temperature applications," *IEEE Microw. Mag.*, vol. 25, no. 8, pp. 77–87, Aug. 2024, doi: [10.1109/MMM.2024.3403300](https://doi.org/10.1109/MMM.2024.3403300).
- [A5] M. Bozzi, "The MTT-s technical areas: Striving for scientific excellence [President's Column]," *IEEE Microw. Mag.*, vol. 25, no. 8, pp. 10–13, Aug. 2024, doi: [10.1109/MMM.2024.3403045](https://doi.org/10.1109/MMM.2024.3403045).
- [A6] F. Schindler, "Information, knowledge, and understanding [MicroBusiness]," *IEEE Microw. Mag.*, vol. 25, no. 8, pp. 14–15, Aug. 2024, doi: [10.1109/MMM.2024.3403046](https://doi.org/10.1109/MMM.2024.3403046).
- [A7] G. Crupi, V. Vadalà, M. Mercuri, C. Li, and X. Gong, "The 2024 MTT-S graduate student fellowship awards [Education News]," *IEEE Microw. Mag.*, vol. 25, no. 8, pp. 88–94, Aug. 2024, doi: [10.1109/MMM.2024.3403311](https://doi.org/10.1109/MMM.2024.3403311).
- [A8] R. L. Schmid and N. Pohl, "Technical committee 24 report 2021–2023 [MTT-S Society News]," *IEEE Microw. Mag.*, vol. 25, no. 8, pp. 95–98, Aug. 2024, doi: [10.1109/MMM.2024.3403312](https://doi.org/10.1109/MMM.2024.3403312).
- [A9] C. Saha and G. Chattopadhyay, "Igniting the waves: MTT-S expands its horizon in Kolkata, the city of joy [MGA News]," *IEEE Microw. Mag.*, vol. 25, no. 8, pp. 99–102, Aug. 2024, doi: [10.1109/MMM.2024.3402570](https://doi.org/10.1109/MMM.2024.3402570).
- [A10] N. H. Abd Rahman, "Exploring the wilderness: Amateur radio adventures in royal belum, perak and kualu keniam, pahang [Women in Microwaves]," *IEEE Microw. Mag.*, vol. 25, no. 8, pp. 103–108, Aug. 2024, doi: [10.1109/MMM.2024.3403313](https://doi.org/10.1109/MMM.2024.3403313).
- [A11] S. Bhattacharyya, A. Bhattacharya, S. Sinha, and Z. Akhtar, "Report on YP activities during MAPCON 2023 [Young Professionals]," *IEEE Microw. Mag.*, vol. 25, no. 8, pp. 109–112, Aug. 2024, doi: [10.1109/MMM.2024.3403314](https://doi.org/10.1109/MMM.2024.3403314).
- [A12] T. Ohira, "Solution to last month's quiz [Enigmas, etc.]," *IEEE Microw. Mag.*, vol. 25, no. 8, pp. 114–115, Aug. 2024, doi: [10.1109/MMM.2024.3403315](https://doi.org/10.1109/MMM.2024.3403315).
- [A13] "Conference calendar," *IEEE Microw. Mag.*, vol. 25, no. 8, p. 120, Aug. 2024, doi: [10.1109/MMM.2024.3403316](https://doi.org/10.1109/MMM.2024.3403316).

