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International Microwave Symposium
16-21 June 2024, Washington, DC

The 2024 Microwave Week 3MT Competition, in Memory of John Bandler: Remembering Our Champion

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It was the International Microwave Symposium (IMS) in San Francisco, CA, USA, in 2016. I had defended my dissertation just weeks before, and because I would be delivering a poster presentation later that day, I approached my assigned table at the speakers' breakfast, empty but for a couple I hadn't met: a polite, elegant woman accompanied by a man whose work, it would turn out, I did know. Their assigned table was already full; would we mind if they joined this one?

This was how I met John Bandler.


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Introduction

Known to most in our field for devising, implementing, and scaling the numerical optimization technique of space mapping [1], [2], John also had nontechnical reasons to attend IMS that year. It was there that he jointly delivered a short course on presentation skills [3], [4], aimed to address a problem John had been thinking a lot about at the time: if they were not careful to avoid it, IMS presenters could easily fall into the trap of addressing their technical presentations to only the small subset of fellow experts who already understood the respective topics [5]. To him, it seemed this had already

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Digital Object Identifier 10.1109/MMM.2024.3364572
Date of current version: 9 April 2024

created pressing issues for the field, as many educated members of the general public still vocally feared 5G. For that matter, many still feared the microwave oven in their own kitchen—and engineers, he observed in our conversation, didn't seem outwardly concerned with correcting the record. In addition, increasing numbers of bright young science, technology, engineering, and mathematics students were choosing computer engineering, a field whose importance was more clearly communicated to them than that of electrical engineering, even though, before our eyes, demand for electrical engineers was growing as societies raced to switch energy-consuming devices of all kinds to clean, sustainable, modern electrical ones. Why weren't more of us helping our students connect the dots?

To John's mind, the time had come for our field to take up the responsibility of teaching its young members to deliver the sort of presentation their supervisors and departments often overlooked (and, still, sometimes, even undermine and scorn): the presentation designed for an audience of nonexperts. No stranger to "swimming against the current" [2], John felt strongly that one day, when our field attained a critical mass of young people who habitually elucidated—who felt compelled to help people understand this field they so loved, who welcomed questions truly and warmly, and who reflexively and nimbly employed metaphor, analogy, hooks, and backstory among other rhetorical techniques as appropriate—we would all derive benefit. For example, a more positive public opinion of microwaves would, he predicted, help increase the number of, and diversity among, students choosing to pursue microwave engineering [6], [7]. In such a world, it would be more fun to attend IMS too. John was just looking for a partner in this endeavor, which, if we worked hard and delivered our best, had the chance to change the way our field communicates.

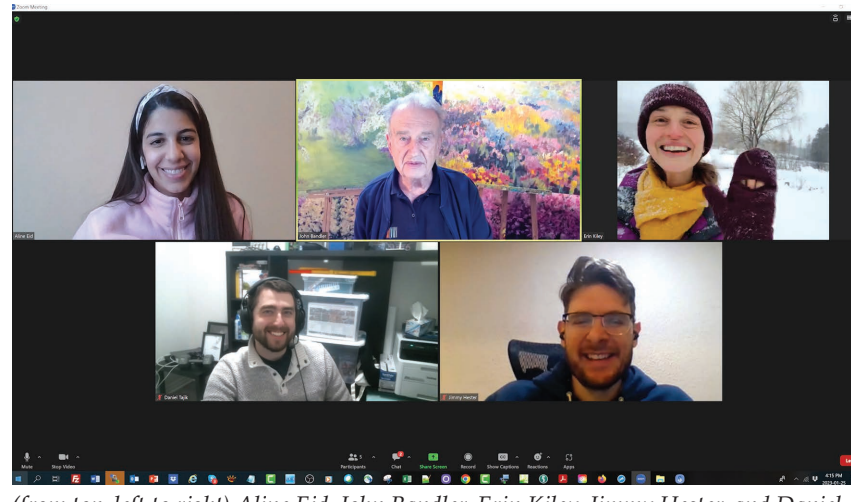
How could I refuse? Presentations to nonexpert audiences were quickly

JOHN BANDLER

John Bandler and Erin Kiley at the TPRC/AdCom meeting in San Antonio, TX, in January 2020, preparing for a very different competition, and a very different Microwave Week, than the online-only one that would take place later that year.

YASIN BAKIŞ

John Bandler, Daniel Tajik, and Erin Kiley (from left) after Daniel's first-place and Audience Choice-winning 3MT presentation at Microwave Week in Honolulu, HI, in June 2017. (In the background, Daniel & Erin's Ph.D. advisors can be seen chatting with one another.)



SCREENSHOT CREDIT: JOHN BANDLER.

(from top, left to right) Aline Eid, John Bandler, Erin Kiley, Jimmy Hester, and Daniel Tajik, on a Zoom call in January 2023, preparing for last year's 3MT competition. John, an accomplished artist, is seated in front of two of his own paintings.

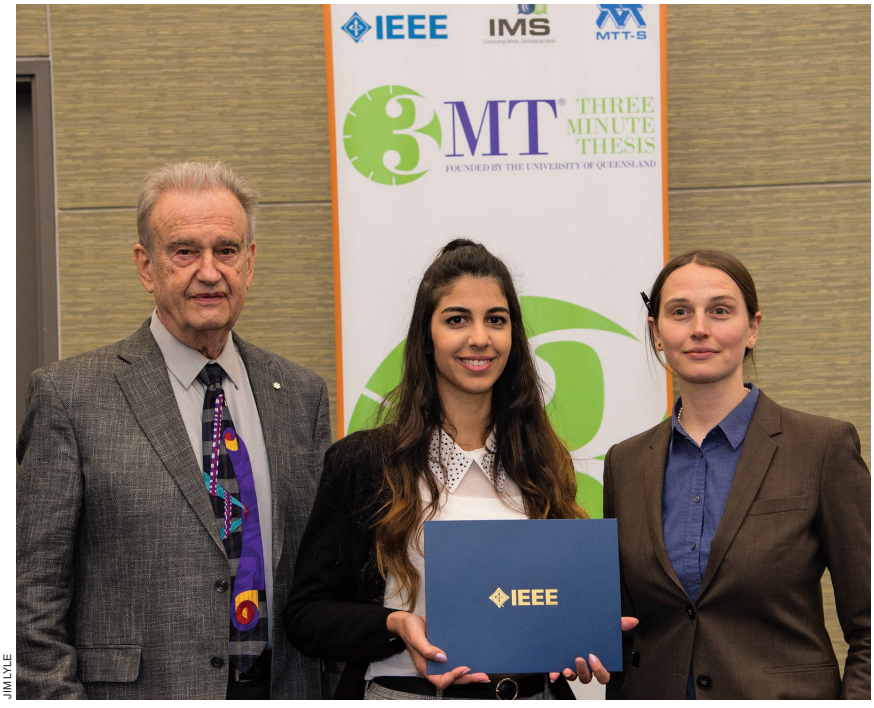
becoming my own mission, too, as I needed that kind of professional "retooling" to better serve the students at the undergraduate-only, public liberal arts institution I would soon join as a new assistant professor of mathematics. What if, in the future, I could be a part of making sure that general-audience presentation skills were simply one set of wrenches every graduate in our field had in their toolbox and knew how to use?

That afternoon in the San Francisco Convention Center, the first of a great many discussions John and I would share on communication, rhetoric, and presentation had set forth a torrential flow of ideas, and after several hours, we settled on a plan to bring a Three Minute Thesis (3MT) competition to IMS. Now in its eighth year, the Microwave Week 3MT competition has grown to include candidates from the IEEE RF Integrated Circuits (RFIC) Symposium and Automated RF Techniques Group (ARFTG) [8], has shifted its organizational structure to become a subcommittee of the IEEE Microwave Theory and Technology Society (MTT-S) Education Committee [9], and has improved and expanded its months-long virtual mentoring program for finalists [10]. This year, the 3MT organizing committee warmly welcomes you to attend the Microwave Week 3MT competition, whose assiduously trained finalists promise to deliver their best. Whether you attend or not, you stand to gain much from these passionate articulate young people, whose hard work preparing for competition day has left them with life-changing skills and with the good habit of describing cutting-edge high-frequency electromagnetics research in ways understandable and meaningful to the general public.

3MT Concept and Rules

First introduced by the University of Queensland, Australia, in 2008 [11], the 3MT competition has since been adopted by hundreds of universities worldwide [10] as well as by events like Microwave Week. In 3 minutes or less, using only one static slide and no props, each finalist contestant delivers a presentation about their research to a panel of nonspecialist judges [12]. Among the diversely talented judges of previous Microwave Week 3MT competitions, we count a science fiction author [9], an NPR journalist [13], a professional musician [8], and a poet laureate [13]. The one thing all our judges have in common is that they are not engineers!

Finalists are required to be students or to fit the MTT-S's description of Young Professionals (within 15 years of having received their first professional degree). Contestants must author a technical paper accepted for presentation at that year's IMS, RFIC, or ARFTG, and to enter, they must check the box on the paper submission form indicating 3MT entry (keep this in mind when you submit for next year!). At the time of paper acceptance, all 3MT-presenting authors are invited to upload an "audition" video, on the basis of which the organizing committee selects the field of finalists. Each finalist may speak just once, with no substitutions, and only one 3MT presentation per accepted paper is allowed [12].



JIM LYLE

John Bandler, Aline Eid, and Erin Kiley (from left) after Aline's second-place and Audience Choice-winning 3MT presentation at Microwave Week in Boston, MA, in June 2019.

Mentoring Process

When you are selected as a finalist in the Microwave Week 3MT competition, you're not "on your own." Instead, it's the beginning of a months-long training phase leading up to the big day, coached and guided along the way by your fellow competitors and by us, the 3MT organizing committee. We invite all finalists to a webinar in March, hosted by the MTT-S Education Committee, explaining the basics of good presentations in general, and then to a session that explains the 3MT competition and its rules in more detail; we also offer optional weekly group training and practice sessions, where attendees gather, practice, and help one another improve.

The process of developing a slide, script, and delivery in the 10 weeks leading up to the 2024 Microwave Week 3MT competition has taken our finalists anywhere from a few minutes to a few hours each week—an

investment that promises to leave them with techniques and good habits that will serve them for the rest of their lives and that promises audience members they'll see these hard-working well-practiced candidates at their best.

To get a head start on preparing for next year's competition, please see recordings of previous webinars [14], [15], [16], [17], [18], [19], [20] and of previous Microwave Week 3MT competitions [21], [22], [23], [24], [25], [26], [27]. Please see, also, a list of dos and don'ts for live presentations [5] as well as a talk by John Bandler [28] featuring "diverse examples and case studies and touching aspects of story, persuasion, bias, trust, impact, fear, first impressions, citations, subtext, metaphor, theatricality, authenticity, articulation, etiquette, awareness, being remembered, slide composition, theme, respecting your audience, the elevator pitch, admitting setbacks, and more" [6].

The process of crafting a presentation for a general audience—about highly complex technical material and with just 3 minutes to speak—is a challenge. It's a still-greater challenge to deliver your presentation in a way that kindles surprise and curiosity in the audience and that allows your individuality to shape the judges' perception of you, formed the very first moments they watch you take the stage.

Lifelong Benefits for Competitors

Like many of life's challenges, crafting and delivering a 3MT talk will help you grow. It will also help you understand your own research better so that you can more clearly communicate to employers why they should hire you, to investors why they should fund your research, and to customers why they should choose your product. In virtually any career path you wish to pursue, you will be helped by the skill of clear communication without oversimplifying (which is insulting to the audience) and without resorting to jargon (which shows a lack of awareness on the speaker's part). You may be surprised at how much these techniques and skills differ from the patterns you naturally fall into when speaking with other experts in your chosen field. For general communication, clarity is central, and knowing your audience is key.

As examples of how clear general communication skills can help you, we again get personal. Among our 2024 organizing committee members are Aline Eid and Daniel Tajik, two former Microwave Week 3MT competitors who both won Audience Choice awards as well as ranked prizes for their 3MT presentations. After her award-winning 3MT presentation [29] in 2019, Aline published an extension of her IMS submission [29] along with a press release that employed many of the rhetorical techniques she learned in the 3MT training process. This led to an explosion of interest in her work and to numerous interviews, with her paper [30] being read more than 120,000 times and featured in more than 40 domestic and international news outlets [31]. Aline is now an assistant professor at the University of Michigan.

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Daniel, who won both the first prize and the Audience Choice award for his presentation [32] at the inaugural IMS 3MT competition in 2017, completed his Ph.D. program in 2022, having interned at Apple and GE Water and Process Technologies, and is now employed by MDA Ltd. on robotic systems for lunar orbits. He was also recently appointed assistant adjunct professor at his alma mater, McMaster University, where part of his responsibilities includes mentoring and training graduate students, drawing on the skills he honed as a 3MT candidate.

Prizes

In 2024, we plan to award cash prizes to the top three competitors, as decided by the judges, and to the Audience Choice winner. We also plan to designate a special named 3MT award in memory of John Bandler, with this year's winner decided by the 3MT organizing committee. These prizes will all be given at the MTT-S Student Awards Luncheon, typically held on Thursday afternoon of Microwave Week.

Conclusion

The day I met John Bandler in 2016, he and I began the hard, rewarding work of bringing seven successful 3MT competitions to Microwave Week. We defined these successes by several metrics: first and foremost, the hundreds of finalists mentored through the 3MT program, two of whom returned to help us co-organize the competition for several years running, paying forward their experience by serving as mentors themselves; the many more hundreds of audience members who have learned new things or who have picked up fresh ideas to help them connect with the general public about their own research; the overwhelmingly positive feedback from those who witness the magic happening as candidates discover their confidence and project their individuality from the stage. The support we've gotten from our own colleagues. Yes, these competitions have been successful, and our eighth year promises to build on this legacy. We hope you'll attend and see the magic for yourself.

Dedication

The 2024 Microwave Week 3MT competition is named in memory of John Bandler, who died on 28 September 2023. For the last seven years of his life, John shared his gifts, talents, and

wisdom with 3MT candidates, always eager to offer insight on presentation, communication, ethics, bias, first impressions, and so much more. For the hundreds of students he mentored, he dutifully served as both coach and champion. For those of us fortunate enough to have worked closely with him as 3MT co-organizers, John taught us additional lessons about responsibility, integrity, and commitment to a team—lessons that have helped us become harder workers and better people. It is in bittersweet recognition of John's enormous impact on us and on hundreds of previous 3MT competitors—and it is in service of his vision of an MTT-S that reaps the benefits grown by a generation of clear communicators nurtured on the time and energy of devoted mentors—that we continue to organize the Microwave Week 3MT competition, which we dedicate to John Bandler in 2024. As so many former students, colleagues, and friends said to him on stage at the IMS closing session in 2022, "Thank you, John" [33]. For more information about John Bandler's extraordinary life and career, as well as the legacy he leaves our field, please see memorial tributes by McMaster University [34] and by the MTT-S [35].

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Acknowledgment

Just as the Microwave Week 3MT competition would not exist without John Bandler, neither would it exist without Beth Bandler, who always gave sage advice to John, to the organizing committees, and to the candidates alike, even offering to serve as a judge in years when plans changed at the last minute. Above all, Beth has been unwavering in her love and support of John as he pursued this 3MT project he so sincerely and proudly believed in. We also thank Ricardo Figueiredo, Ramesh Gupta, Sherry Hess, Rachelle Ho, Ana Kovacevic, Michelle Ogrodnik, Tushar Sharma, Daniel Shields, Nicholas Simard, Megan Vierhout, John Vlachopoulos, Mahmoud Wagih, and many more for inspiring us to think about effective communication. For personal support, we owe a debt of gratitude to Madhu Gupta. We are always grateful when the steering committees and technical program committees of IMS, RFIC, and ARFTG work with us to ensure that the competition is smoothly integrated into the programs of these conferences, and we thank the MTT-S Education Committee, especially Xun Gong, for its support in helping this happen. We heartily thank Maurizio Bozzi, Nuno Borges de Carvalho, and Rashaunda Henderson, who made sure 3MT would become a perennial feature of Microwave Week. Brian Carr, Michael Oakley, and Sandy Owens have greatly assisted us with technical matters in their areas of expertise, and Cassandra Carollo, Amanda Scacchitti, and Elsie Vega have also helped as needed.

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