

A Review of the IEEE Photonics Society in 2020



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- Meet the Newly Elected Members of the Board of Governors 2021–2023
- The 2021 IEEE Photonics Society Young Investigator Award



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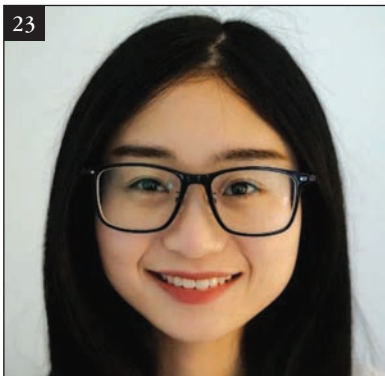
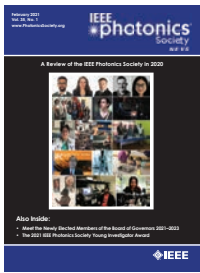
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Editor's Column

DOMINIC SIRIANI

Welcome to the first issue for 2021 of *IEEE Photonics Society News*! I'm excited and privileged to be the new Editor-in-Chief, and, thanks to the diligent and enthusiastic contributions from our staff and volunteers, I think things are off to a great start! As I look back at what the Newsletter has been and forward to what it could be, the foremost thought on my mind is what you, the Photonics Society members, want to share and gain from this publication. So, as I begin my new tenure, I want to encourage you to reach out to us with your contributions, comments, and requests (ipsnewsletter@ieee.org). We're here to listen and report!

After an unprecedented year, it's worthwhile to reflect on the innovativeness, resilience, and passion of our members during 2020. In this issue, Photonics Society President Carmen Menoni and Executive Director Doug Razzano take a look at the Society's various events and accomplishments of the past year. Zetian Mi and his conference co-chairs present their highlights from the first ever fully virtual IEEE Photonics Conference. Nicolas Fontaine and Fatima Garcia-Gunning guide us through some virtual lab tours, just one of the successful events at IPC and ECOC 2020. Finally, there are several highlights of past and ongoing events and initiatives—the PRISMA Conference for LGBTIQ+ people in science, technology, and innovation; the new Tyndall "Explorer" program; the Kyambogo University Chapter's Photonics Week; the UK and Ireland Chapter's HOPES webinar series; and offerings and insights of the Silicon Valley Women in Photonics Chapter.

Our always reliable, insightful, and thoroughly enjoyable mainstays of the Newsletter are also returning in 2021. A necessary evil for some and a refreshing diversion for others, office meetings are the topic of Daniel Renner's piece in his ongoing Industry Engagement series. Vice President of Conferences Perry Shum answers a slew of insightful questions posed by Naznin Akter. Senta Jantzen takes us into the lives and labs of three more young researchers—Abhinav Sharma from the Max Planck Institute for the Science of Light (MPL), Germany; Naznin Akter from Florida International University; and Guowu Zhang from McGill University. And Chris Doerr provides us with some lighthearted lab fun with his crowd-pleasing cartoon. Additionally, Akhil Kallepalli, who is the new Associate Vice President of Young Professionals (YPs), kicks off his new series for and by Photonics Society YPs.

Finally, as I mentioned in the opening of this column, what is foremost on our minds at the Newsletter is what is on your minds. Not only do we want to hear

(continued on page 5)

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President's Column

CARMEN S. MENONI

As we start 2021 let's celebrate one of the biggest scientific accomplishments of this century, the development of a vaccine to treat and control COVID-19, a virus that almost a year ago changed our lives in many ways, and in particular the dynamics of our professional life. Achieving this remarkable success in such a short time is not fortuitous. It relied on previous scientific findings, and it involved the extreme dedication and collaborations of key players worldwide working towards a common goal.

In Photonics there are examples of large-scale, complex projects that have also required the most important players to come together for a common goal. Close to my area of expertise is "Extreme Ultraviolet Lithography" (EUV), which major developments occurred through Sematech, an international consortium formed by the main industrial players in the field. Today, EUV steppers are on the fabrication floor producing the most advanced semiconductor chips.

Another example is the complexity associated with fabricating state-of-the-art photonics devices and photonic integrated circuits that has been driven by the creation of consortia, such as the United States' AIM Photonics offering complete integrated photonic manufacturing and metrology capabilities. National consortia are spearheading the development of photonic devices and integrated circuits on a silicon platform that are key in numerous technologies, which include sensing, imaging, and information processing.

Quantum information science is also driving large scale interdisciplinary efforts, and in this area, Photonics is playing a paramount role through the demonstration of single photon emitters, optical processors, and single photon detectors. Integration of these components into silicon or hybrid platforms will be instrumental towards the demonstration of scalable, practical integrated quantum photonic architectures.

The photonics landscape is much broader than the few examples I cite above. Nevertheless, all efforts of the photonics community share similarities in that they are driven by the interest to discover, engineer and produce the next novel device or system architecture and to transition technologies for massive production. We have learned from the discovery and production of multiple vaccines against COVID-19 that innovation, collaboration, the exchange of research findings, agility and translational research are essential to further expand the boundaries and reach of Photonics.

In all of these pursuits, the IEEE Photonics Society is providing its members and the community at large with opportunities to collaborate, share ideas, and support their professional development. You can get a glimpse of the Society's accomplishments in 2020 also published in this issue.

*With warm regards,
Carmen S. Menoni*

*2020–2021 IEEE Photonics President
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A Conversation Between Newsletter EiCs, Nicolas Fontaine and Dominic Siriani

As Nicolas Fontaine wraps up his tenure as Editor-in-Chief of the Newsletter and Dominic Siriani prepares to begin his, the two have had several conversations about the recent past and the near future of the publication. The discussions have revolved around ambitions, achievements, and areas for improvement; evolving content and reliable mainstays; balancing leading and listening; and, most importantly, serving, representing, and involving the entirety of the Photonics Society membership. What follows is a back-and-forth between the two that represents the most top-of-mind matters when it comes to the Newsletter. And we hope you're able to use this as an opportunity to join the conversation, and we welcome your questions and feedback.

NF: I had a great time doing the Newsletter for the past three years. It took me a while to get into it, and I finally got the hang of being EiC as I was leaving. The hardest thing was to try to encourage people to submit non-technical articles from around the world. Especially, trying to reach outside of my own professional networks to reach everyone.

DS: That's something I immediately noticed is that you've got some really ambitious and enthusiastic volunteers at this point now, and we're trying to bring on more people like them.

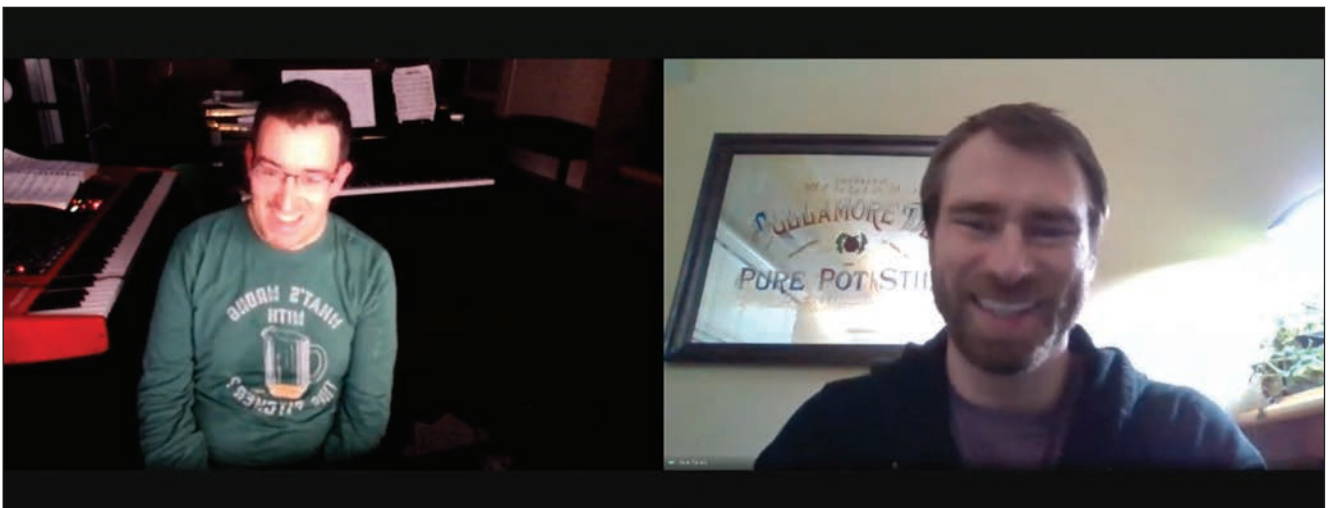
NF: My favorite experiences with the Newsletter were involving younger people because they're going to be the people of the future and are eager to look for ways to volunteer. Normally, it takes some time for the young/new volunteers to be excellent contributors. At first, they want to get told everything to do. Eventually they realize they can develop and run with their own ideas that they are passionate about. And then that's best because they are inspired to work hard on it, and they'll do a great job.

DS: So while you were the EiC, what were your primary goals for the Newsletter?

NF: I had a huge list of things I wanted to improve with the Newsletter, but only accomplished a few of them. One of my favorite accomplishments was re-introducing student editors. The two success stories are Senta Jantzen's column "Photonics Worldwide," where she finds different students around the world to share a picture and a few paragraphs about their laboratory and what they do. That's a good way that people can share what they're up to in photonics globally. And the other one is "Get to Know Your Photonic Society Leadership," which Naznin Akter is leading. In my final issue we introduced a new leadership updates column—the idea was to have the leadership actually say what they're doing and how they need help. I am hoping that could become a regular column because I feel it's important for the leadership to be able to show to the Society what they are working on and how they need help! The Society is really big and full of so many people with great ideas but only a small subset of people elected in the leadership.

DS: What has been the greatest challenge as EiC?

NF: The research highlights have always been a very strange type of article—it's not really a journal paper but the contributors always want to write it like a journal article. And also it only used to feature one research group per issue. I prefer learning about people, institutions, and culture behind the research. I've been trying to evolve the research highlights into collections of much shorter articles from around the world. Rather than a shorter version of a journal paper, they would be more like, "These are the people working, this is our area, this is what we like to do, come visit us, these are cool toys in our lab." And of course you can have a little bit of tutorial stuff in there like "What is quantum optics?" In the previous issue we had a "Lab Tricks" column on beam measurements for lidar. The idea was to share some expert laboratory techniques/skills to the public that you would not necessarily disclose in a journal paper. Previously, we had one on "Python for Automation."



DS: Daniel Renner also came up with a suggestion for expanding the research highlights to encompass things like commercialization highlights—so technology that no longer is really in the research phase but has actually been fully commercialized. I think that’s an interesting idea. It makes the section a little bit more all-encompassing, interesting to people in all stages of their career and across all segments of photonics—so from academia to government labs to industry.

NF: I think though for all these articles what’s most important is to be written by someone in the photonics community and not some random tech writer. So I guess it could be a problem if you try to get too many “professionally written” articles in there, and you lose touch with the photonics community.

DS: Yes, that’s at the heart of the Newsletter—to make sure it comprises content directly from our members, which is one of the strengths. But it’s also one of the challenges because, of course as you mentioned, we have to make it appealing and easy enough for people to submit research highlights. It is sometimes a struggle to find people who want to write or even necessarily know where to go.

NF: One challenge was that the articles in the newsletter were not archived. You couldn’t cite them.

DS: Yeah, but you know at least if we start—and you know this is one of the main goals during my time with the newsletter—to move things online, it would make it more broadly accessible and more easily referenced, even if it’s an informal way through a web link. And it makes it more shareable.

NF: Personally my favorite version of Newsletter would be just a four-page pamphlet mailed to everyone that has very very short important things that you want to tell the community, like the conferences coming up, what the board of governors/leadership is doing, the committees and how to reach out if you want, people who received some award or a grant... mostly about what the society is doing and where we need help and volunteers. And for everything else go onto our website where you can see tons of articles. That would be my ideal Newsletter.

DS: I think that’s true for a lot of people, and there are a lot of advantages to that sort of system, both financially and ecologically—it’s a lot less paper—and just for ease of access and timeliness. A lot of people also like having a paper version to read. So that’s why we’re doing the survey right now, to get a sense of who wants to see things go more online, who wants to

stick with something paper, who wants a hybrid. It’s going to be critical to get that feedback from the membership to figure out what’s going to best serve the entire community.

NF: So in your opinion, what is the value proposition of the Newsletter?

DS: The whole purpose of the newsletter is just to keep the community connected: for one, to important technology and science—but you know of course there are all kinds of journals for that—so really it’s about connecting members to one another—keeping people updated on what’s going on within the Society, at the members level, and at the leadership level. That’s the most important thing is to have this engagement of members within the Society, and we want to see that grow more and more. We want to make the Newsletter a little bit more of a conversation with members, get a little bit more feedback from them, get more contributions. And also by going to something like an online format, we can have more direct interaction through social media, comment sections, web board postings, and the like. So that’s the value of the Newsletter, to get back to your question: it’s all about connecting members to each other and to the goings-on in the Society.

NF: Yeah, that’s pretty much what the Society is for: connecting people.

DS: Exactly. I want to have people really engage in the Newsletter and for people to be coming to us excited with ideas to write articles and share what’s going on. It’s really something we’re passionate about, and we really want people to be involved. The other half of that is that not only do I want people to get involved, but I also want to know that what we’re doing and what we’re providing is what’s best for our members. So we have the survey right now to find out about what direction we should go in the future. And going forward I want to be receiving feedback from people like, “This section or this article really spoke to me, and I really want to see more like that,” or “This whole section could be done better.” Or new ideas for things that are missing from the Newsletter that people like to see in other community news sources. It’s important to get that feedback to make sure that we’re doing the best thing for our members, so that’s what I’m hoping that this conversation will convey to people and create a little spark to ignite some ideas.

Please reach out to the Newsletter staff with your feedback! And remember to participate in the Newsletter survey to help guide the direction of the Newsletter!

Editor’s Column

(continued from page 2)

about your news, events, and ideas, but we also want to know how best to serve you. My predecessor, Nick Fontaine, and I have had several conversations over the past several months about this, and we’ve included one here for your benefit. We hope this provides some transparency into the

goings-on at the Newsletter, and we hope it inspires you to reach out to us. So please contact us, and please participate in the ongoing Newsletter survey and our other solicitations in the future. I’m looking forward to a great 2021 with you all!

Industry Engagement

Life at a Photonics Startup: Lessons Learned Meetings—the Good, the Bad and the Brand-Spanking New

By *Daniel Renner*

The quality of meetings is a constant topic of conversation in most organizations, and very much so in startups. We have all heard comments such as; meetings are a waste of time; meetings are too long and involve too many people; meetings are key to retaining our team culture; virtual meetings are great but make it easy to get distracted; and many more. All these comments have validity, of course.

A great many meetings do waste a great deal of everyone's time and seem to be held for historical rather than practical reasons [1]–[3]. On the other hand, it is clear that organizations cannot function without meetings, as a means to communicate, discuss problems and opportunities and arrive at decisions. In addition, meetings fulfill a deep human need. Humans are a social species. In every organization and every culture, people come together in small groups at regular and frequent intervals, and in larger “tribal” gatherings from time to time. Face-to-face meetings in particular play an important role in developing people's attachment to their company and to each other, a team spirit. If there are no face-to-face meetings in the places where they work, people's attachment to the organizations they work for will be weak [3]. Thus, meetings perform many functions:

- A meeting defines the team, the group, or the unit. Those present belong to it; those absent do not. Everyone can look around and perceive the whole group and sense the collective identity of which he or she forms a part [3].
- A meeting is the place where the group revises, updates, and adds to what it knows as a group. Every group creates its own pool of shared knowledge, experience, judgment, and tradition [3].
- A meeting is the place where problems and opportunities are discussed, and decisions are made regarding future action. Meetings can efficiently bring together ideas and opinions and allow people to do their jobs in a more coordinated and cooperative manner. By discussing and deciding as a group, this creates in all present a commitment to the decisions. Once something has been decided, even if you originally argued against it, your membership in the group entails an obligation to accept the decision. Real opposition to decisions within organizations usually consists of one part disagreement with the decision to nine parts resentment at not being consulted before the decision. For most people on most issues, it is sufficient to know that their views were heard and seriously considered. They may regret that they were not followed, but they accept the outcome [3].

As mentioned, meetings can have both positive and negative aspects. New meeting formats have both pros and cons. The question to be addressed in this article is how to make



meetings mostly positive in a small business environment, where the consequences of poorly executed meetings can be very expensive, catastrophically expensive in some instances. It is straightforward to calculate the direct cost of holding a meeting and it is an illuminating exercise to determine whether there is enough value in the output of the meeting to justify the expense. A small meeting, involving only four or five people for an hour, can cost a thousand or more dollars in direct cost (salaries plus overhead). A meeting of ten or twelve people for an hour can cost several thousand dollars. This might be an excellent investment of company funds, but it is not always the case. Unfortunately, very often it is not the case. In addition to the direct cost of the meeting we should also consider the missed opportunity cost of holding an ineffective meeting. This cost can be orders of magnitude larger than the direct cost. It is imperative for all organizations and for small businesses in particular to ensure that their team members are trained on effective meeting techniques and that they are conscious of the balance between the meeting output value and the meeting cost.

Meetings come in all sizes, some include just a handful of people and others many thousands. The focus of this article is on meetings that happen in small startup companies, relatively small meetings from two people to a few tens, at most. For these meetings at small businesses, you should consider the following eight principles for effective meetings:

Define the Purpose of the Meeting

The first question to ask yourself is: What is the purpose, the objective of the meeting?

What are the topics to be discussed? What is the desired output of the meeting? How do we know that the meeting objective has been achieved?

The second question to ask yourself is: Does a meeting provide the best mechanism to achieve these objectives?

Are there other paths to achieve the objectives that would be more appropriate, more efficient? Can an email discussion work better? Email is a powerful tool for a group to discuss issues and arrive at decisions in a time effective manner. It is not always appropriate though. It is time-efficient for each participant, but the time that it takes to reach a decision can be long. In addition, discussions via email require special attention given that all the non-verbal communication is lost, which leads to misunderstandings regarding intent and tone of the conversation. Face-to-face meetings give you the whole range of human communication paths and for some issues they really are the only possible way. Another option to consider is Management By Walking Around (MBWA). Rather than calling a meeting where the discussion will mostly consist of several one-on-one conversations, meet with each individual (or smaller groups of individuals) separately. This is more time consuming on the meeting organizer but less so for the meeting attendees and, on the balance, can be more time effective for the whole group.

Think whether a virtual meeting would be more effective than a face-to-face discussion for the objective you want to achieve and the circumstances. For discussions involving people at different locations or in the middle of a pandemic, as we are now, there might not be another choice. Pay special attention that all participants are engaged, since the threshold to join in the discussion is higher in virtual meetings for many people. Virtual meetings also limit non-verbal communication and introduce several other challenges that we will discuss as we progress through this article.

Once you have decided that a meeting is needed to achieve your objective(s), communicate these objective(s) to the attendees through an Agenda. This is your plan for the meeting! You should ask others to suggest agenda items, which increases meeting relevance, ownership and engagement. For clarity, you can also add a statement explaining what the objective(s) are. Send the Agenda out before the meeting, but not too far ahead-people should have this information fresh in their minds. A few days ahead is ideal, but this depends on the nature of the meeting of course. It is good practice to identify Agenda items as being "For information" or "For decision," so that those preparing for the meeting can better understand the nature of the objective(s).

In the case of regular, periodic meetings, you should ask yourself these questions for every meeting. If the answer is that the meeting is not necessary at that particular time,

simply cancel. Periodic meetings have an ability to self-perpetuate, so constantly question whether the meeting should take place at that given time and whether that series of meetings is still relevant. If it is not relevant any longer, redefine it or cancel the whole series of meetings. The proliferation of company meetings should be critically fought back. Have fewer but better meetings.

Make the Meeting as Small as Possible

It is not possible to define an ideal number of attendees, of course. This will depend on the nature of the meeting. But there is evidence to suggest that keeping the meeting small is beneficial [1]. You are better able to notice body language when there are fewer people. Smaller meetings make it easier for everyone to participate. This is key: make sure that everyone participates, the chair should drive the discussion and involve in the discussion those that are remaining silent. Limiting attendees to a number somewhere between five and eight is recommended. Some meetings need fewer than five people, of course, and a few other meetings might need more than eight people, which should be the exception. Exceeding twelve people is highly discouraged. If you do need to go above twelve attendees, such as in an all-hands meeting, for example, the degree of planning and facilitation must go up to still achieve meeting effectiveness.

That said, you don't want to pare the invite list down so much that necessary people aren't present, or others end up feeling slighted [2]. The leader may have to leave out people who expect to come or who have always come. This needs tact to be communicated; but since people generally believe that they are overworked already and dislike going to meetings, it is not usually hard to get their consent to stay away.

The right balance of who attends and who doesn't will depend on the nature of the meeting and the attendees. It is a subjective measure, but you need to be comfortable that you have reached the right balance. You might also consider a timed agenda, in which attendees join only the portions of the meeting pertinent to them, which is a powerful tool to improve meeting effectiveness.

Prepare

All items should be thought of and thought about in advance if they are to be usefully discussed. If documents or presentations are produced at the meeting for discussion, they should be to the point, brief and simple. It is a supreme folly to bring a group of people together to read six pages of closely printed sheets to themselves [3].

Discussions that require significant preparation should be planned well ahead. Make clear, with the Agenda, what preparation is necessary for the attendees. Lack of preparation by the meeting chair and attendees is one of the main causes for ineffective meetings.

Be Present at the Meeting

You have been invited to the meeting because your contributions are believed to be necessary. Make sure that reality supports this belief and that you contribute with your full capability. Some people think that they can multitask, that they



can finish an e-mail or read through their Twitter feed while listening to someone in a meeting. But research shows that they really cannot. Recent neuroscience research makes the point quite clear on this issue [1]. Multitasking is simply a mythical activity. We can do simple tasks like walking and talking at the same time, but the brain cannot handle multitasking. In fact, studies show that a person who is attempting to multitask takes 50% longer to accomplish a task and makes 50% more mistakes. So, smartphones and other electronic devices should be discouraged at the meeting.

The second reason to limit the use of smartphones at the meeting is that they distract and annoy others. Surveys indicate that meeting participants using electronic devices during discussion can annoy other participants and this can have very negative consequences if the person annoyed is a potential customer with whom you are having a group meeting. People can feel insulted when someone reaches for the phone in a meeting, particularly if the meeting involves people from other companies.

Still, there are some good reasons to have electronic devices at a meeting. Perhaps you are waiting for an urgent and important message, business related or personal. If this is the case, the device can certainly be used, but make sure to indicate at the beginning of the meeting that this is the situation. If these circumstances do not apply, have everyone silence their devices and pay attention to the discussion.

Virtual meetings offer the opportunity of using smartphones or working on other tasks discreetly, without distracting others or upsetting customers. This should only be done if it will not affect the quality of your contribution to the quality of the meeting outcome, of course.

Maintain the Meeting Focus

Through the duration of the meeting there will be constant pressure to move into other topics, whether related to the Agenda or not. This needs acute vigilance by the part of the chairperson. If the discussion starts to move into a tangent, it should be brought back to the main path to achieve the meeting objective within the allocated time. If the tangential topic deserves further discussion, action should be defined to address it separately. In some instances, a critical unforeseen item related to the meeting objective is uncovered in the discussion and in this particular case it should be allowed to take as much time as necessary, of course.

Encourage the clash of ideas, provide an environment where creativity can be unleashed and at the same time have clear boundaries in your head as to when the conversation has diverged too far and should be brought back to the center, so that the group does not lose sight of the meeting objective.

Start on Time and Finish on Time (or Earlier)

There is only one way to ensure that a meeting starts on time, and that is to start it on time. Latecomers who find that the meeting has begun without them soon learn the lesson. The alternative is that the prompt and punctual members will soon realize that a meeting never starts until ten minutes after the advertised time, and they will also learn the lesson [3]. Start-

ing and finishing meetings on time (or earlier) should be part of the company culture of reaching deadlines on time. The opposite, starting and/or finishing late, particularly in meetings chaired by top management, sends the message that timeliness might not be that important in the company. Meeting attendees might also have other commitments following the scheduled end time and the delay will then have a domino effect for activities later in the day.

You might consider stand-up meetings to improve time efficiency. There is empirical data that proves they work. Allen Bluedorn from the University of Missouri and his colleagues concluded that stand-up meetings were about 34% shorter than sit-down meetings, yet they produced the same solutions [1]. Going for a walk, rather than standing up in a room, is a good solution in many instances. But do not let the format distract you from what really matters, running an effective meeting.

An important role of the meeting chair is to ensure that the participants are aware of time and control those that take an unnecessarily long time in their participation. It is hard to provide guidelines on how long a meeting should be, this depends on its nature of course, but you should think carefully to justify to yourself meetings longer than an hour. Very few business meetings achieve anything of value after an hour and a half or two hours and an hour is enough time to allocate for most purposes. Attendees' attention and decision-making power starts waning if the meeting extends for much longer than an hour. In fact, think whether a meeting lasting 45 minutes or 30 minutes would suffice. If it is necessary to meet for periods longer than an hour, make sure to provide adequate breaks so that the attendees can recharge.

Capture Decisions and Action Items

The output of the meeting should be captured in the form of a list of decisions and action items. A good practice is to have a person at the meeting, other than the chair, assigned to capture these. You should reserve a short time at the end to review them and make sure that all participants agree. An action item is properly described by a brief sentence that includes a verb, a person responsible to complete it and a completion date. That is, it should describe:

What are we going to do?

Who is responsible?

When should it be completed?

It is not strictly necessary to describe How will we do it? This question might need one or more separate meetings to define, but if there already are some ideas relating to this, they can be added as a comment. The review at the end of the meeting is a good time to ensure that all action items include all their elements. The person responsible for the action item should be someone present at the meeting. If the assigned responsible person is not present at the meeting, someone present should be tasked with communicating this with the absent responsible person.

Get Feedback

Start from the premise that it is not easy to be a meeting chair or a meeting attendee. Develop your meeting skills

collectively, relying on the insight and wisdom of all. Whether you are the meeting chair or a meeting attendee, spend some time getting feedback on your meeting effectiveness and what can be done to improve it. In general, not enough time is spent improving meeting skills, to the detriment of the whole organization. Face-to-face meetings lend themselves better than virtual meetings to provide feedback and discuss meeting improvements. A special effort should be applied to generate feedback when virtual meetings are the dominant format.

As you finish reading these eight principles for effective meetings you might say that this is all obvious, that it is “common sense”. The question though is, if it is “common sense,” why are these principles not commonly followed? They are “common sense” but they are not “common behavior.” They are not part of our built-in DNA, they are an acquired skill, thus education and training are needed. I encourage you to make these principles part of your set of skills. You will not be disappointed.

References

- [1] “HBR Guide to Making Every Meeting Matter,” *Harvard Business Review Press*, 2016.
- [2] Steven G. Rogelberg, “Why Your Meetings Stink – and What to Do About It,” *Harvard Business Review*, January–February 2019.
- [3] Anthony Jay, “How To Run a Meeting,” *Harvard Business Review*, March 1976.

About the Column

This is a regular column that explores business aspects of technology-oriented companies and in particular, the demanding business aspects of photonics startups. The column touches on topics such as financing, business plan, product development methodology, program management, hiring and retention, sales methodology and risk management. That is to say, we include all the pains and successes of living the photonics startup life.

This column is written sometimes by me (Daniel Renner) and sometimes by invited participants, so that we can share multiple points of view coming from the full spectrum of individuals that have something to say on this topic. At the same time, this is a conversation with you, the reader. We welcome questions, other opinions and suggestions for specific topics to be addressed in the future. If you have any questions or comments please contact me at, ipsnewsletter@ieee.org.

The expectation is that this column will turn into a useful source of business-related information for those who intend to start, join, improve the operation, fund, acquire or sell a photonic startup. A fascinating area that I have been one of those lucky to enjoy as a way of living for a long time.

A Bit About Me

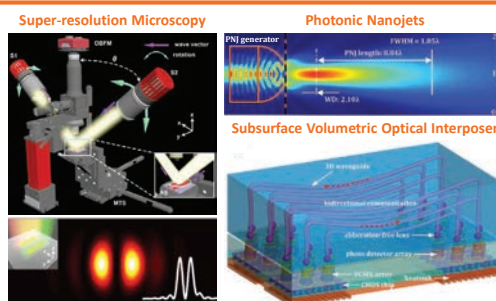


I (Daniel Renner) grew up in the wilderness of Chilean Patagonia, which is one of the sources of my quest for adventure and for exploring new areas. In my early twenties I went to the University of Cambridge in England to do a Ph.D. in Opto-Electronics, a new area at the time. Now, decades later, I have lived through the whole

range of experiences that relate to the development, manufacturing and commercialization of complex photonic devices and systems used in communication, sensor and industrial applications. My experience spans both technical and business aspects of photonic products. This experience has included both large and small companies, which gives me a reasonable vantage point to comment on the ups and downs of life in a photonics startup.

I am currently Chief Business Development Officer at Freedom Photonics in Santa Barbara, CA, and I look forward to the regular conversation to be carried out through this column!

Postdoc Opening in Experimental and Theoretical Optical Systems at the University of Illinois at Urbana-Champaign



Qualified candidates are sought to conduct postdoctoral research with Prof. Lynford Goddard with the goal of co-developing optical instrumentation and techniques for device characterization, computational analysis, and/or machine learning. For more information, see <http://psl.mntl.illinois.edu/pdra.pdf>.

The University of Illinois is an EEO Employer/Vet/Disabled <http://go.illinois.edu/EEO> that participates in the federal e-Verify program and participates in a background check program focused on [prior criminal](#) or [sexual misconduct history](#).

The University of Illinois must also comply with applicable federal export control laws and regulations and, as such, reserves the right to employ restricted party screening procedures for applicants.

Get to Know Your IEEE Photonics Society Leadership

*Prof. Dr. Perry Shum,
Chair Professor Optoelectronics Intellisense Lab, Photonics Society Vice President of Conferences
Southern University of Science and Technology (SUSTech), Shenzhen, China*

What is Your Current Profession?

I am currently a Chair Professor of Southern University of Science and Technology (SUSTech) at the Department of Electrical and Electronic Engineering (EEE), Shenzhen, China. My research interests focus on silicon photonics, optical sensing, and laser technologies. I have published more than 900 peer-reviewed papers, and my h-index is 45. I have received aggregated research funding of more than USD 7 million as PI or co-IP.



(IPC) is our major society conference each year. IPC 2021 will be in Canada, and IPC 2022 will be in Singapore. Together with Conference Council members, we are in the process of planning the future of IPC with the consideration of time, venue, and technical areas.

What Do You Want to Accomplish as a Board Member this Year/Next Year?

I wish to help to make IPC the major conference in Photonics.

What Role Does Your BoG Position Play for the IEEE Photonics Society? What Challenges Do You Face in Your Part?

I am currently Vice President of Conferences for the IEEE Photonics Society. One of my key roles is to chair the Conference Council. My responsibility as a Chair of the Conference Council is to regularly review the society's meetings portfolio to identify and resolve current issues and challenges and make suggestions for new meetings. The Conference Council is also responsible for reviewing and approving technical co-sponsorship requests, Chairs and Representatives for selected conferences, and location and venue selections for the IEEE Photonics Conference. Due to COVID-19, the challenge I am facing this year is to work with various committee members via teleconference and attend virtual conferences instead of physical onsite meetings.

What are You Currently Working On?

I must host a virtual Conference Council meeting monthly. Due to Conference Council members' different geographical locations, the primary challenge is to find a standard time suitable for most people to meet online. The IEEE Photonics Conference

Why Photonics? What was Your "Photonics Moment?" (More Personal Background Story, etc.)

I began to know about Photonics as early as my undergraduate final year project. That was also the reason I decided to do a Ph.D. in the field of photonics. My photonics moment probably was the moment I received the IEEE EDS/MTTS India Chapter best paper award in Photonics-98.

What About our Society's Mission and Work that Motivates You?

I joined the IEEE Photonics Society as a member when I was a student. Before I became the chairman of the Conference Council, I worked quite closely with the membership council.

What Specific Assets Do You Bring to the Table as a Board Member?

I think I can help promote the IEEE Photonics Society in Asia, and I started the Optoelectronics Global Conference (OGC) with the Photonics Society as the main organizer.

Mention One Thing you have Changed and One Thing you Want to Switch to Improve the IEEE Photonic Society?

The IEEE Photonics Society is a very well-established society. I would like to make incremental contributions to the photonics community, its conferences, and future developments.

Can You Name a Person Who has had a Tremendous Impact on You as a Leader? Maybe Someone Who has Been a Mentor to You? Why and How did this Person Impact Your Life?

I want to give my special thanks to Jagadish, a friend and a mentor to me. He is always willing to offer help to me as well as Photonics Society members.



At OGC 2019 conference.

PHOTO CREDIT: DR. PERRY



PHOTO CREDIT: DR. PERRY

OGC 2019 conference highlights.

What are the Most Important Decisions You Make as a Leader of the IEEE Photonic Society?

The most important decision I made was to accept the VP position and serve in the IEEE Photonics Society. No regrets.

How Would You Advise Members Who Want to Become More Involved in Society?

I strongly encourage regional members to consider starting a student chapter branch as well as a regional chapter.

Why Do You Think Members Should be Involved as Society Volunteers? What are the Benefits?

There are many benefits. Financially, members can enjoy a conference discount. Technically, there are so many online resources available to members.

What Advice Would You Give Someone Going into a Leadership Position for the First Time?

Be humble and learn from senior mentors.

How Do You Ensure the IEEE Photonic Society and its Activities are Aligned With Your Core Values?

We have to work closely with volunteers from different sectors and make sure everyone is fully aligned.

When Faced With Two Equally Qualified Candidates, How Do You Determine Whom to Choose?

I will prefer to choose the one who is willing to learn and is responsible for his/her work.

What is One Characteristic that you Believe Every Leader Should Possess?

Willingness to listen and draw a conclusion and make the best decision for the benefit of society.

What is the Biggest Challenge Facing Leaders Today?

Time. We all have 24 hours a day. Capable leaders may reach the limit if overcommitted.

What is One Mistake You Witness Leaders Making More Frequently Than Others?

Not being able to make decisions. Especially tough decisions.

What Kind of Help and Support Do You Need From the IEEE Photonics Society?

The IEEE Photonics Society organizes or sponsors many conferences in the world. I would like to hear from conference organizers or delegates on whether we can enhance Photonics Society conferences' technical qualities. I want to work with domain experts to explore the development of new technical tracks or special sessions. We can also help promote IEEE Photonics Society membership and facilitate global collaborations under our conference platform.

How Can Members Get Involved and Find More Information About Your Progress/Role?

Members can contact me (shum@ieee.org) or any Conference Council member directly if anyone is interested in helping or providing feedback.

Tell us Something Fun About Yourself!

I spent most of the time on undergraduate student projects rather than graduate projects. I prefer to give senior students more freedom to choose research topics and find their path.

A Space for Young Professionals

What's important—Let's talk

By Akhil Kallepalli, AVP of Young Professionals & Young Professionals Advisory Committee Chair

What a year 2020 has been for all of us. This has, by far, been the single most universally challenging year in our lifetimes and I hope it is the last of those!

2021 begins with an optimistic outlook and expectation with news regarding vaccinations and a better understanding of COVID-19 available for science, industry and the general public. I am hoping that we, in the Photonics Society, can ride this optimistic wave of the pandemic's eventual resolution with initiatives to promote and enable better opportunities globally for Young Professionals (YP) in the Society.

In this issue's column, I would like to share:

- Initiatives of the future
- Plans for the Young Professionals Advisory Committee, formed in the New Year, with a motivation to prioritize all aspects of early-career professionals, including personal well-being, professional opportunities and equality, diversity and inclusion (EDI).
- Some personal thoughts and experiences

The YP community, members and volunteers up to 15 years post their first degree, members and volunteers up to 15 years post their first degree, within the Photonics Society is one of the largest sub-groups of our membership. Any member who has completed their first graduation or qualification is eligible. This includes many professionals in various sectors and well into their careers. With the Young Professional Advisory Committee, I would like to focus on facilitating the improvement of professional experience with development opportunities. Simultaneously, this also goes to include those professionals who are considering transitions between domains (industry, academia, public sectors) and/or career levels.

Young professionals hold great potential in shaping the future scenario of any workplace, environment and culture. Giving this community the tools and ability to achieve this positive change is one of the primary motivations of the committee. The Advisory Committee intends to focus on, but not limit itself to:

- Leadership, training and professional development
- Increasing and enhancing volunteering opportunities
- Providing a smooth transition between career levels and sectors
- Assisting in better education and mentoring programs
- Positively educating, promoting, and facilitating equality, diversity and inclusion
- Highlighting and promoting positive mental health
- Recognizing individuals and organisations facilitating positive change

This does not limit our collective interest, as the global community has a diverse set of requirements and challenges; a set that also allows us to learn from one another. A specific problem in one region may have been overcome by the mem-

bership of another region; the committee intends to include this philosophy from the very beginning.

As this is our first conversation, let me share a couple of serendipitous stories with you. In August 1996, an aspiring, young Larry showed up to an orientation session at Stanford. He was considering doing his graduate studies there. A student was assigned to him to show him around-meet Sergey! Even though they disagreed on a lot, they found a lot they agreed on too. Little did either know that in a few years, they would co-found Google. Consider the possibilities here, and the serendipitous nature of that meeting.

This one is a personal story. I have been volunteering for the IEEE UK and Ireland Photonics Chapter since 2017. In December 2019, just before the pandemic became an all-encompassing reality, I helped organise the British and Irish Conference on Optics and Photonics (2019 IEEE BICOP). I was in the audience when an ever-enthusiastic and one of the best presenters I have ever met—Prof Miles Padgett—took the stage for a plenary talk. As soon as he finished his talk, with me only weeks away from handing in my thesis, I approached him to consider future collaboration opportunities (as I had done with many other researchers as well). After an interview that occurred in the airport while I was on my way for my first US conference with funding from the IEEE Photonics Society, I submit my thesis and signed a contract for a postdoctoral position at the University of Glasgow. In the same conference visit, I came to meet Lauren (Mecum-Smith) from the Photonics Society; a meeting that would eventually bring me this very role.

I am not saying my story is similar (if only!) or different from that of Google, but I'm hoping to highlight that the opportunities that present themselves have no way to let us know what the future has to offer and how much good can come of one opportunity!

In a recent webinar series I organised, I requested the speakers to share their advice to early career professionals and students. When posed to Prof Padgett (University of Glasgow), his response was “*Work with the smartest people you can find that want to work with you. You can learn something from each other. Work somewhere you will be happy ... I think the people you work with are more important than what you are working on.*”

As I begin my term as the AVP of Young Professionals and Chair of the Young Professionals Advisory Committee, I invite you to be a part of this conversation, encourage participation and involvement of the membership in the hope and belief that together we can make the future better than the past, no matter the task.

About the Column

This regular column is written on behalf of and for Young Professionals in the IEEE Photonics Society. The eligible membership

for YP are members up to 15 years post their first degree graduation. This makes the IEEE Young Professionals community one of the largest groups within the membership. Through this column, with inputs from me and other invited authors, the objective is to reach and cater to the needs of this diverse community. The expectation of this column is to ensure that it provides a forum for me to share the Advisory Committee's progress in achieving its objectives (more to come on this) and encourage you to write back to me with your insights and promote a positive, ever-progressing outlook. Please reach out to me if you would like to comment, support and write for this column (akhilkallepalli@ieee.org). I am happy to connect on Twitter (@OptoPhysAkhil) as well.

A Bit About Me



I (Akhil Kallepalli) grew up in the vibrant coastal town of Visakhapatnam in India. My background is diverse and of a “jack of all trades” nature; I have worked on remote sensing, hyperspectral imaging, biomedical optics and biophotonics, and novel modalities for sub-diffraction level imaging. After completing my Ph.D. in biomedical optics and biophotonics at Cranfield University (Shrivenham, UK), I am now based at the School of Physics and Astronomy at the University of Glasgow as a postdoctoral research associate.

– ATTENTION IEEE PHOTONICS SOCIETY MEMBERS –



We are curious to learn what our members think of the current format of the newsletter and find ways to modify it to best meet your needs and expectations.

Complete the survey and share your opinions today!

IEEE Photonics Society Newsletter Survey

This survey will help us to redesign how the newsletter is brought to you, (by way of print or online). Please answer to the best of your ability and leave any comments you think may be helpful to us in delivering the content you want to see. It is important to us that you are receiving materials that best suit you, our members.



Let your voice be heard - Fill out the survey!

Visit: bit.ly/34YDXCw



Photonics Worldwide—This is My Lab

When the going gets tough with labs around the world still being closed due to COVID-19, it makes me very happy to read the inspiring stories of young professionals and early career researchers. I am very excited to introduce you to Abhinav Sharma from the Max Planck Institute for the Science of Light in Germany, Naznin Akter from at Florida International

University in the USA and to Guowu Zhang from McGill University. I hope you enjoy these stories as much as I do, and if you would like to tell your story, please get in touch!

Senta Jantzen
S.Jantzen@soton.ac.uk

I am **Abhinav Sharma**, a Ph.D. student at the Max Planck Institute for the Science of Light (MPL), Germany. I work under the supervision of Prof. Philip Russell. During my B.Sc. in Physics I found interest in optics and decided to pursue my career in this domain. After completing my engineering and MSc in photonics, I decided to go for a Ph.D. Since I had profound interest in the field of laser and fibre optics, I aspired to work under the supervision of Prof. Russell at MPL. My work focuses on optical trapping and manipulation of micro- and nano-particles inside a hollow-core photonic crystal fibre using a laser source. One of my projects is to monitor air pollution using optical methods. Considering the impact of particulate matter on the environment and health, my work investigates how a single-beam optical trap configuration can help in counting, sizing and in measuring the refractive index of particles with an aerodynamic diameter of less than $2.5\ \mu\text{m}$ (PM_{2.5}) in real-time with an effectively unlimited device lifetime. This novel method relies on the optical forces, which automatically capture and propel the particles in front

of the fibre through the hollow core. The resulting transmission drop, together with the time-of-flight of the particles, provide an unambiguous mapping of the particle diameter and the refractive index with high accuracy.

I am **Naznin Akter** from Bangladesh. I have received My B.Sc. (Hons.) and MS degree in Applied Physics, Electronics and Communication Engineering (APECE) from the University of Dhaka, Bangladesh, in 2012 and 2014. I received my second MS degree in Electrical Engineering in 2020 from ECE, FIU. Currently, I am a Ph.D. Candidate in the Department of Electrical and Computer Engineering (ECE) at Florida International University.

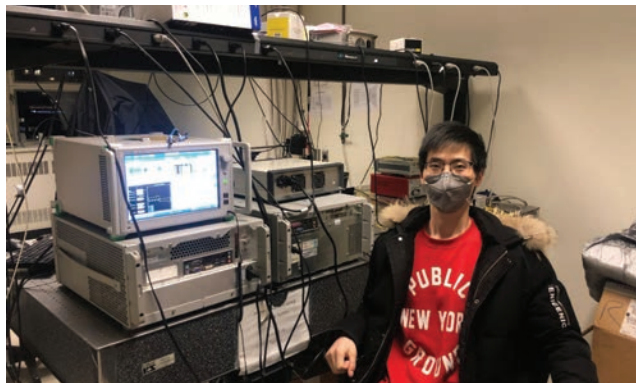
My journey with Photonics started when I joined the IN-SYST Integrated Nanosystems Research Laboratory Lab at FIU. I was intrigued by the tremendous potential and influence of photonics on various perspectives of our daily community life and instantly fell in love with it. My research is broadly focused on Nanophotonics, Plasmonics, Metamaterials, THz devices, and technologies. Though I do not have previous photonics-based research experience, I can now cope with the up-to-date photonics research due to my advisor Dr Nezhil Pala's exceptional supervision, guidance, and research-based sincere approach. Currently, I am investigating and exploring novel materials such as graphene to design a high responsivity, low noise, tunable, compact size, faster response time, lower cost, and room temperature operable THz detector.



Moreover, the same devices are expected to serve as THz emitters when plasma wave instabilities are excited under the right biasing conditions and expected to have a higher emission power. I am also working on THz IC image processing using convolution neural network (CNN) based deep learning to identify faulty ICs among pure ICs, which is crucial for future hardware cybersecurity applications. Apart from this, I am also working on some collaborative projects focused on biosensing and metal-ceramic based nanocomposites for solar energy harvesting. I like to work in a diverse field, which allows me to explore and learn more. As a researcher, I am always open to new ideas and concepts to investigate and comprehend the diverse world of photonics and its evolution over time. I am profoundly grateful and pleased to have the privilege of working with state-of-the-art infrastructure in a photonics laboratory and contributing to improving photonics impact on a brighter future.

My name is **Guowu Zhang**, a 3rd-year Ph.D. student at McGill University. My research interest is on computational methods for nanophotonic design and optimization. The most fascinating thing about this research field is that it provides a general solution for designing and optimizing nanophotonics devices using Maxwell's equations instead of playing with various geometries for different devices. The computational method intends to design devices with appealing features, like low insertion loss, low crosstalk, compactness and robustness to fabrication errors.

My story with photonics can be tracked to my MSc in Zhejiang University. In my MSc, I mainly worked on digital signal processing algorithms for optical communication systems. I used optical devices, like lasers, modulators, photodetectors, etc. to build an optical system. However, at that time, I had no idea



about how these devices are designed. Luckily, during my Ph.D. at McGill University with Professor Odile Liboiron-Ladouceur, I started working on designing nanophotonic devices. But my previous research experience still affects my Ph.D. research. For example, whenever I started designing a device, I always tried to use algorithms and code to further optimize my designs. I kept doing this until I was amazed by one of the techniques that I came across called adjoint-method based inverse design. All the performance that I was perusing at that time is described by mathematical language in that technique. I realized this was the research field I wanted work in, as I already have experience with optimization and designing nanophotonic devices. Now, we have a collaboration with National Research Council Canada targeting further investigation on computational methods for nanophotonic devices design. I enjoy working with my supervisor and pioneers in silicon photonics from the National Research Council Canada since we always have insightful discussions.

IEEE Women in Photonics Leading a Brighter Future



www.PhotonicsSociety.org



IEEE Photonic Society's Women in Photonics program provides educational development that supports the participation, engagement and advancement of women in the photonics and optics community.

WIP GOALS

- Encourage and support next generation of women in photonics through STEM outreach and mentorship.
- Encourage gender inclusion within photonics community and Society; editorial boards, conference committees and leadership positions.
- Create new volunteer opportunities, local affinity groups and recognition programs to empower women members.
- Develop diverse educational programs, outreach initiatives and training resources.

The Women in Photonics program is also seeking to diversify the range of individuals and perspectives influencing the photonics technology and information of tomorrow.

Photonics Society Year End Accomplishments

2020 has been perhaps the most uniquely challenging year in recent memory. Together, we faced many difficult decisions. We were challenged at every turn, both in society life and at home. That said, we were still hugely successful in so many ways. Below is a list of major Society successes in 2020, which we can all be proud of.

Also, as we continue into 2021, we want to thank our members, volunteers, and staff for your commitment to our Society and to wish you and yours much peace and prosperity in the New Year. It is our hope that each of you will continue to support the photonics profession and the advancement of technology for humanity.

IEEE Photonics Society 2020 Accomplishments:

Membership & Chapters

- Photonics Society membership increased 3.4% as compared to 2019, despite the pandemic. This included 311 new Society undergraduate student members, a demographic we have struggled to reach in the past. It is also worth noting we were one of only six, out of 45 Societies to increase membership this year.
- We installed 12 new chapters and revitalized 4 existing chapters. We also developed chapter promotion kits to help with local membership development and growth, as well as monthly Chapter Briefs and bi-monthly chapter chair trainings.
- We issued 54 Chapter & Education Grants, reaching 28 different countries; focusing on developing nations in isolation during pandemic.
- We supported the IEEE Photonics Kenyatta Chapter's creation of a low-cost mechanical ventilator prototype to combat COVID-19. The Tiba-Vent garnered national and international recognition. Now in the clinical trial phase, the project aims to increase the number of ventilators in Kenya from 500 units to more than 30,000. This breakthrough resulted in a UN "Persons of the Year 2020" Award (October 2020)!

Outreach & Education

- We supported more than 85 online programs, with new style events to better reach members in a virtual environment.
- We continued to support the International Day of Light with the "See the Light" campaign that incorporated "Better Diagnostics & Treatments of Infectious Disease" resources in relation to COVID-19; over 300 activities performed worldwide.
- The IEEE Photonics Society, along with co-sponsors the OSA, SPIE, AIM Photonics, partner on a new initiative

launched in collaboration with MIT's Initiative for Knowledge & Innovation in Manufacturing. Collectively, the partners are contributing \$75K to fund AAS technical degrees in photonics and optical engineering manufacturing.

- We held our first ever "Virtual Lab Tour" in conjunction with the IEEE Photonics Conference. This session was conducted with (8) photonics lab groups worldwide. The labs provided demos on experimental setups, i.e. integrated devices, nanophotonics, biophotonics, quantum optics, etc. as well as data methods. This was very well received and will become a best practice for future events.
- The IEEE Photonics Society has paired 800+ student members with mentors, through an "eMentor Match", during the COVID-19 pandemic. The program includes 1:1 meetings and "Mentor Hour" meet-ups.
- We continued our relationship with the National Society of Black Physicists (NSBP) by sponsoring the NSBP Conference (November 2020) where we led a "Transformational Leadership" session as well as supporting an "African American Workforce Development" strategy meeting with the National Science Foundation (NSF)
- We partnered with the 'IEEE Public Visibility' team to ensure our diverse members are seen and acknowledged for their accomplishments/service, i.e. monthly features.

Conferences

- We cosponsored the first ever "hybrid" OFC, where virtual attendees could participate in all technical sessions, plenaries, workshops, etc. as well as hosting on site conference and exhibit attendees.
- We cosponsored the first ever "virtual" CLEO. The event saw almost 20,000 registered attendees from 75 countries around the globe. The event consisted of 2,014 technical presentations, 248 technical, dynamic ePoster and poster Sessions, 4 plenary speakers, 14 Symposia and A&T Topical Reviews, 2 workshops, and 13 Special Events, Market Updates and Product Showcases. The event was free to registered attendees due to the unusual situation.
- The IEEE Photonics Society also hosted 3 all virtual conferences, which included:
 - Summer Topicals—130 technical presentations, 857 registered attendees
 - RAPID—154 technical presentation, 737 registered attendees
 - IPC—412 technical presentations, 2012 registered attendees
 - IPC also included 4 Plenary Speakers, live panel sessions including all of the Industry Forum programming, daily talks including WiE, Photonics Pro, and Distinguished Awardee, and Virtual Lab Tours of 8 labs coordinated by volunteers delivered via Zoom.
 - All these events were offered free to registered attendees.

Governance & Awards

- We transformed the Society leadership position of Vice President for Technical Affairs to the Vice President for Professional and Technical Development, expanding the role to oversee the professional and technical activities that contribute to advance the professional development of the members of the society. Prof. Anna Peacock, University of Southampton, will assume this role starting January 2021.
- We held the first ever virtual Awards & Recognition Ceremony which was professionally produced by IEEE TV. The video now plays on our website. Congratulations to all our honorees!
- We cosponsored the John Tyndall Award which is awarded to Prof. Michal Lipson, Columbia University, for “fundamental and technological advances in integrated photonic devices”. Prof. Lipson is the first woman honoree to receive the award.

- We saw the inaugural presentations of the Laser Instrumentation Award; Congratulations Juergen Czarske, TU Dresden, and the Technical Skills Educator Award; Congratulations Alexis Vogt, Monroe Community College.

Publications

- IEEE Journal of Lightwave Technologies, JLT, saw its impact factor increase to an all-time high of 4.288, while publishing more than 7,000 pages, which included 8 special issues.
- IEEE Journal of Selected Topics in Quantum Electronics, JSTQE, saw its impact factor rise to its highest ever at 4.917.
- We selected a new EiC for the IEEE Photonics Journal, beginning in Jan. 2021. Congratulations to Prof. Gabriella Cincotti, Roma Tre University.
- Prof. Seb Savory, Univ. of Cambridge, has been appointed to serve as Vice President for Publications starting 2021.



IEEE Photonics Commitment to Diversity Opportunities

Diversity & Inclusion Scholarships & Grants

Merit-based recognition for student members, young professionals and volunteers championing diversity and inclusion efforts in the photonics community.

Women in Photonics Scholarships & Grants

Merit-based recognition for outstanding students and early career women in the photonics community.

Multicultural Outreach & Globalization Grants

Grants for chapters and research centers to support academic exchanges and to address international and cross-cultural scientific understanding.



For more information, email:
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GABRIELLA BOSCO



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GABRIELLA BOSCO

(S'00-M'02-SM'13-F'19) is currently a Professor at the Department of Electronics and Telecommunications of Politecnico di Torino, Italy. Since 2011, she has served on the program committee of several international conferences co-sponsored by the IEEE Photonic Society (IPS), among which the Conference on Lasers and Electro-Optics (CLEO) and the Optical Fiber Communication conference (OFC), for which she acted as Program Chair in 2017 and General Chair in 2019. She is currently serving as the Editor-in-Chief of the IEEE/OSA Journal of Lightwave Technology, having previously served as Associate Editor from 2014 to 2017 and as Deputy Editor in 2018. Since 2019, she has been serving as one of the IPS representatives on the OFC Steering Committee and as the chair of the "Optical systems and networks" track at the IEEE Photonics Society's Annual Meeting (IPC). She served in the IPS Distinguished Lecturer Committee from 2014 to 2016 and she is currently a member of the Photonics Society Joint Awards Committee.

YANNE K. CHEMBO

(M'12-SM'12) is currently affiliated with the Electrical and Computer Engineering Department of the University of Maryland at College Park, where he leads the Photonics Systems Lab. He was previously a Research Director at the Centre National de la Recherche Scientifique (CNRS) in France. He has served as Associate Vice-President for Outreach for the IEEE Photonics Society Membership Council (2016-2019), as Member of the International Commission of Optics (ICO) steering committee for Regional Development (2015-2017), and as a board member for the International Year of Light 2015. He has also served as member of the scientific committee for several international conferences, such as SPIE Photonics West, SPIE Photonics Europe, OSA Latin America Optics & Photonics Conference, or CLEO Pacific Rim. He is an Associate Editor for the OSA journal Optics Express. Y. K. Chembo is an awardee of the European Research Council (ERC), and of the NASA Invention and Contribution Board. He is an OSA and SPIE Fellow.

LIDIA GALDINO

(M'15) is a Lecturer in the Department of Electronic Electrical & Engineering at University College London, and a Royal Academy of Engineering Research Fellow. Since 2019, She serves the IPS as the Associate Vice President (AVP) of Women in Photonics within the IEEE Photonics Society Diversity Oversight Committee and the Society's Membership Council. Her role is to develop strategies to increase the participation and engagement of women in the optics and photonics community as well as to inspire and support the next generation in the field. She is also an IEEE Photonics Conference committee member.

RAY-HUA HORNG

(M'07-SM'11-F'15) is currently a Distinguished Professor in the Institute of Electronics and also a Chair of Department of Electronics Engineering at the National Chiao Tung University in Taiwan. Prof. Horng has been a treasurer (2015-2016) and a president (2017-2018) of IEEE Photonics Society in Taipei Section (PHO 36), Taiwan. She is the president of Taiwan Vacuum Society and vice-president of Taiwan Photonics Society now. She has also played a leadership role of several other conferences, including program committee of Gallium Nitride Materials and Devices in Photonics west, SPIE since 2015, International Advisory Committee of APWS2019, Conference chair of LDC'14 and Program Chair of LDC since 2015, and Program Committee of the International Meeting on Information Display (IMID) since 2016. She is a keen reviewer for IEEE ED, EDL, PTL, JSTQE, Opt. Lett, Opt. Express, Scientific Reports and others.

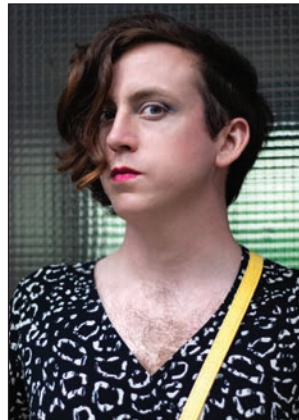
PRISMA

ASOCIACIÓN PARA LA DIVERSIDAD AFECTIVO-SEXUAL
Y DE GÉNERO EN CIENCIA, TECNOLOGÍA E INNOVACIÓN

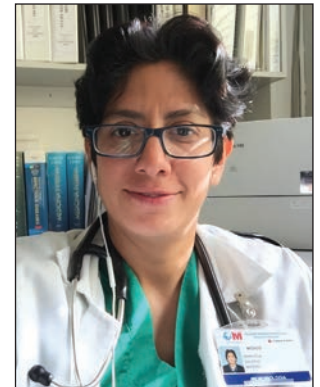
First Conference for LGBTIQ+ People in Science, Technology & Innovation in Spain Attracts More than 200 Attendees

On November 2020, PRISMA, the Spanish Association for LGBTIQ+ people in Science, Technology, and Innovation, organized the first Conferencia PRISMA with support from the IEEE Photonics Society. The bilingual Spanish-English online event highlighted the achievements of queer people in knowledge-generating lines of work, offering a space for the exchange of knowledge and experiences and providing opportunities to create support networks. More than 200 attendees enjoyed the contributions of more than 40 presenters, split across talks, posters, and roundtable discussions. Among the highlights were the keynotes by the trans activist and physicist Dr. Juani Bermejo-Vega, who talked about “Trans-forming Quantum Science,” and by the LGBTIQ+ sexual health activist and physician Dr. Maricela Valerio Minero, who presented her work on “The Phenomenon Chemsex: Social, Epidemiological and Public Health Perspectives.” The association also presented the 10 PRISMA measures for LGBTIQ+ inclusion in research centers.

The IEEE Photonics Society’s Diversity Oversight Committee’s ‘Pride in Photonics’ initiative sponsored this conference, as it aligns with our Society’s commitment to showcase the contributions of LGBTQIA+ people in photonics, optics, physics and engineering. Much like the Society’s other social impact outreach initiatives, Pride in Photonics seeks to create a space for the community to openly share personal experiences, and increase acceptance of inclusion best-practices.



Dr. Juani Bermejo-Vega who talked about “Trans-forming Quantum Science.”

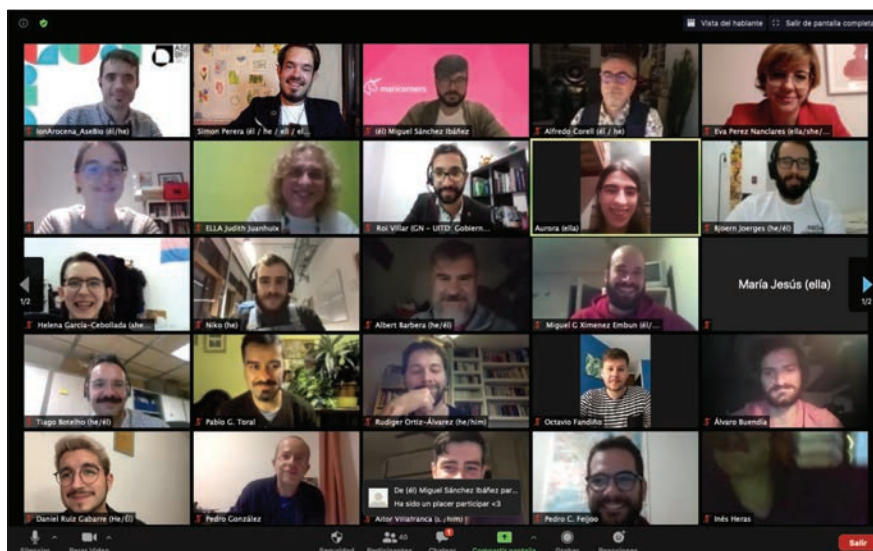


Dr. Maricela Valerio Minero presented her work on “The Phenomenon Chemsex: Social, Epidemiological and Public Health Perspectives.”

The Society fully supports the work of PRISMA and its volunteers as they create welcoming atmospheres for LGBTQIA+ people to be their authentic selves with the aim of inspiring collaboration, open conversation, education, networking and technical dissemination in the company of allies.

To learn more about PRISMA, visit: prismaciencia.org

And, for more information on the IEEE Photonics “Pride in Photonics” initiative, visit: www.photonicsociety.org/who-we-are.



Tyndall Supporting Entrepreneurial ‘Explorers’ for Deep Tech start Up Program

In honor of this year’s bicentennial of legendary physicist and explorer John Tyndall, a new deep-tech pre-accelerator program, aptly named ‘Explorer,’ has been launched.

Together with the Irish Photonics Integrated Centre (IPIC) and in partnership with the IPCEI European cluster collaboration and international high-tech photonics companies OSRAM Opto Semiconductors (OSRAM) and IQE, we are searching for people with an explorer mindset, very much like John Tyndall.

Tyndall had a fearless personality and demonstrated this through his scientific experiments, explanations, and mountaineering exploits. Inspired by this, we are keen to continue his legacy and recruit applicants that are as daring as he was.

The Tyndall Explorer program aims to empower European entrepreneurs and early-stage start-ups with deep-tech ideas, particularly in the areas of photonics and microelectronics.

From February to May 2021, the four-month program will help our successful entrepreneurial explorers to stress test their idea and *learn from the best* European semiconductor companies, such as OSRAM and IQE.

Participants will be introduced to start-up tools and methodologies; given access to resources; and they will be briefed on world-class developments in opto-electronics and microelectronics. Explorer will also offer an opportunity for peer-to-peer learning and to build industrial collaborations across Europe.

In addition, the program will prepare and introduce participants to next stage support, including grant funding and investment.



Six ideas will be selected to participate, culminating in a program showcase where one winner will receive a cash prize of €20,000.

Horizons of Optical, Photonics and Emerging Sciences (HOPES)—A Fresh Look at Webinars!

In most webinars, speakers share information on their latest research and innovative ideas they are working on. But, how about their views on emerging technologies or future based research roadmaps? The Horizons of Optical, Photonics and Emerging Sciences (HOPES) webinar series set out to do just that! A series piloted in November–December 2020 brought together key researchers who presented their vision of future research and innovation.



Conferences and online talks have taken an interesting turn in 2020. Plenary talks from around the world with a similarly wide viewership became feasible. However, the nature of the presentations did not change.

The IEEE UK and Ireland Photonics Chapter set out to reinvent the wheel; thus emerged the Horizons of Optical, Photonics and Emerging Science (HOPES) series. With this series, we took a different approach to seminal webinars. Instead of focussing on a single piece of research and/or innovation, we invited highly impactful researchers of the UK and Ireland region to discuss the future of their research domains. This allowed the speakers to share their informed view of future innovations on a platform that encouraged a true exchange for shaping the evolution of science. The discussions had during the series provided unique solutions to allow interdisciplinary domains to be unravelled.

The questions we asked of our speakers were: *How is the domain of science evolving? What are the latest challenges? What are the emerging technologies that could play a key role in the future?*

We invited speakers from multiple domains, such as: Prof Sarah Bohndiek (University of Cambridge); Prof David Sampson (University of Surrey); Prof Miles Padgett (University of Glasgow); Prof Nick Stone (University of Exeter); Prof Sonja Franke-Arnold (University of Glasgow); Prof Martin Leaby (NUI Galway); Prof Igor Meglinski (Aston University); Prof Andrew Ellis (Aston University); Dr Amanda Foust (Imperial College London); Dr Georgios Zervas (University College London); Dr Liam O'Faolain (Cork Institute of Technology); Dr Amanda Wright (University of Nottingham); and Prof Giles Hammond (University of Glasgow).

Our audience was composed of a broad spectrum of attendees from students to industry (Figure 1). The event was a success, in terms of both attendance and reach. A subset of the attendees (66 responses) presented us with the feedback on a scale of 0–5 (5 being the highest, relative to the question). The HOPES Series received:

The HOPES Series received:

- 69.7% of 5 Rating and 27.3% of 4 Rating when inquiring about satisfaction with the event.

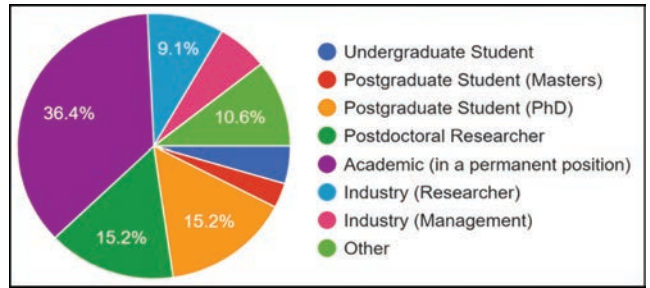


Figure 1. HOPES Attendance (from 66 responses).

- 57.6% of 5 Rating and 39.4% of 4 Rating when inquiring if the event matched expectations.
- 87.9% of the feedback reflected a choice of 1–2 events in the future as opposed to 12.1% that requested a frequency of 3–4 events per month.

Specific talks also received topical, positive feedback. For example, the “acknowledgement of the need for similar talks that provide access to information for early career researchers and PhD students”.

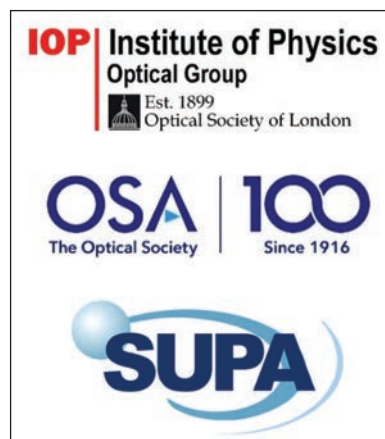
Following the success of the event and the willingness of speakers to participate, the Chapter has decided to make this a regular event. In line with the feedback and logistical challenges, we intend to hold 1 event per month throughout 2021.

We invite suggestions from the prospective audience and speakers who would like to be a part of this event; please write to the HOPES Coordinator, Dr. Akhil Kallepalli at akhilkallepalli@ieee.org.

All the information related to the past and future talks can be accessed through the series website (photonics-ukireland.org/hopes), including the links to the Chapter's YouTube channel to catch up on any events you may have missed!

Supporting Organisations

This event was supported by the parent IEEE Photonics Society and our partners, Institute of Physics Optical Group, Scottish Universities Physics Alliance (SUPA) and the Optical Society (OSA).





Call for Nominations

IEEE Photonics Society 2021 Distinguished Service Award

Nomination deadline: 30 April 2021

The **Distinguished Service Award** was established to recognize an exceptional individual contribution of service that has had significant benefit to the membership of the IEEE Photonics Society as a whole. This level of service will often include serving the Society in several capacities or in positions of significant responsibility. Candidates should be members of the Photonics Society. The award is presented at the IEEE Photonics Conference formerly known as the IEEE Photonics Society Annual Meeting.

Visit the on-line awards platform to nominate a colleague today.
https://ieeecure-platform.com/a/page/society_awards/ieeephotonicsocietyawards

Class of 2021 – IEEE Photonics Society Fellows –

IEEE Fellow is a distinction reserved for select IEEE members whose extraordinary accomplishments in any of the IEEE fields of interest are deemed fitting of this prestigious grade elevation. The IEEE Grade of Fellow is conferred by the Board of Directors.

Wim Bogaerts, “for contributions to design methodologies for silicon photonics components and circuits.”

Gabriella Cincotti, “for contributions to planar photonic devices and beam diffraction in anisotropic media.”

Hilmi Demir, “for contributions to semiconductor nanocrystal optoelectronics, colloidal nanophotonics, and lighting.”

Dennis Killinger, “for contributions to laser spectroscopy.”

Laurent Larger, “for contributions to optoelectronic delay oscillators and neuromorphic processing applications.”

Sophie Larochelle, “for contributions to fiber devices and data transmission technologies.”

Andrey Matsko, “for contributions to the development of microwave photonic oscillators.”

Roberto Morandotti, “for contributions to integrated nonlinear and quantum optics.”

Itsuro Morita, “for contributions to large-capacity transmissions systems with high-speed optical signals.”

Salah Obayya, “for contributions to computational photonics.”

Nelson Tansu, “for contributions to semiconductor photonics technologies.”

Chongjin Xie, “for contributions to optical transmission and datacenter optical networking.”

Please join us in congratulating the 12 Photonics Society Members, included in the Class of 2021!



The 2021 IEEE Photonics Society Young Investigator Award Recipient Xi (Vivian) Chen

The IEEE Photonics Society Young Investigator Award was established to honor an individual who has made outstanding technical contributions to photonics (*broadly defined*) prior to their 35th birthday.

The 2021 Young Investigator Award will be presented to Xi (Vivian) Chen, “*For outstanding contributions to high-speed and high-capacity fiber-optic communications.*” The presentation will take place at the 2021 The Optical Networking and Communication Conference & Exhibition (OFC), 6–10 June, 2021, San Francisco, California.

Dr. Xi Chen received the Ph.D. degree in 2012, from The University of Melbourne, Australia. From 2013 to 2015, Dr. Chen worked as a Research Fellow in The University of



Melbourne, where she received Discovery Early Career Research Award (DECRA) grant from Australian Research Council. Dr. Chen is currently a Member of Technical Staff in Nokia Bell Labs, New Jersey, United States.

Dr. Chen’s research interests include fiber transmission, advanced modulation formats, and digital signal processing for high-speed optical telecommunication systems. She has made contributions to generation and detection of ultra-high symbol rate (e.g., 195 GBaud and beyond) optical signals and generation and detection of ultra-high order modulation formats (e.g. 16384-

ary QAM) for coherent optical systems. Dr. Chen has also contributed to advanced modulation formats and advanced signal processing for short-reach direct detection systems.

Petition for Candidates for Election to the Photonics Society Board of Governors

Petitions for candidates for the next Photonics Society Board of Governors election must be received by the Photonics Society Executive Office no later than 1 April 2021. The Petition must bear the signatures of one percent of the members of Photonics Society as of 1 January 2021, and an indication by the candidate of his/her willingness to serve if elected. Printed name, signature and IEEE member number are required for all individuals signing the petition.



Petition Nomination Deadline: 1 April 2021!



IEEE Photonics Society - Call for Nominations

IEEE Photonics Society 2021 Awards

Nomination deadline: 5 APRIL 2021

Visit the on-line awards platform and nominate a colleague today!

Submit your nomination here!

The **Aron Kressel Award** is given to recognize those individuals who have made important contributions to opto-electronic device technology. The device technology cited is to have had a significant impact on their applications in major practical systems. The intent is to recognize key contributors to the field for developments of critical components, which lead to the development of systems enabling major new services or capabilities. These achievements should have been accomplished in a prior time frame sufficient to permit evaluation of their lasting impact. The work cited could have appeared in the form of publications, patents products, or simply general recognition by the professional community that the individual cited is the agreed upon originator of the advance upon which the award decision is based. The award may be given to an individual or group, up to three in number. The award is administered by the Aron Kressel Awards Committee and presented at the IEEE Photonics Conference.

The **Engineering Achievement Award** is given to recognize an exceptional engineering contribution that has had a significant impact on the development of lasers or electro-optics technology or the commercial application of technology within the past ten years. It may be given to an individual or a group for a single contribution of significant work in the field. The intention is to recognize some significant engineering contribution which has resulted in development of a new component, a new processing technique, or a new engineering concept which has had a significant impact in either bringing a new technology to the market, significantly improving the manufacturability of a component or device, or creating a new technology which will greatly accelerate or stimulate R&D. No candidate shall have previously received a major IEEE award for the same work. Candidates need not be members of the IEEE or the Photonics Society. The award will be presented at the IEEE Photonics Conference.

The **Quantum Electronics Award** is given for exceptional and outstanding technical contributions that have had a major impact in the fields of quantum electronics and lasers and electro-optics. This award is given for truly excellent and time-tested work in any of the fields of interest of the Photonics Society. It may be given to an individual or to a group for a single outstanding contribution or for a long history of significant technical work in the field. No candidate shall have previously received a major IEEE award for the same work. Candidates need not be members of the IEEE or the Photonics Society. The award will be presented at the IEEE Photonics Conference.

The **William Streifer Scientific Achievement Award** is given to recognize an exceptional single scientific contribution, which has had a significant impact in the field of lasers and electro-optics in the past ten years. The award is given for a relatively recent, single contribution, which has had a major impact on the Photonics Society research community. It may be given to an individual or a group for a single contribution of significant work in the field. No candidate shall have previously received a major IEEE award for the same work. Candidates need not be members of the IEEE or the Photonics Society. The award will be presented at the IEEE Photonics Conference.

Membership

IEEE Kyambogo University Photonics Week Annual Event

*Compiled by: Abimbisibwe Dan Chair, IEEE Photonics Society
Chemutai Michelle: Treasurer, Banura Edwin: Publicity Secretary*

2020: Bad Year, Good Start

Despite the fact that 2020 has been a devastating year with the pandemic affecting all, irrespective of social status, race, religion, and age, and bringing everything to a standstill, Kyambogo University founded the IEEE Photonics Society Chapter.



The Kyambogo University chapter, which is one of the youngest Photonics Society chapters, stood up to the challenge by organizing an IEEE Photonics Week that ran from 28th October to 4th November, 2020. It was the first of its kind and came along with exciting activities that surpassed our expectations. Among the activities held were webinars by distinguished individuals from the chapter covering their photonics journey, lessons from sought-out

skills like use of MATLAB, application of photonics in the world today, and practical sessions held in partnership with MOTIV Uganda and namunde Labs that blew the participants off their feet.

The Young enthusiasts were very motivated by the practical sessions that were on new-age technologies of laser cutting, 3D printing, virtual reality, augmented reality, and robotics. These took place consecutively in the selected venues.

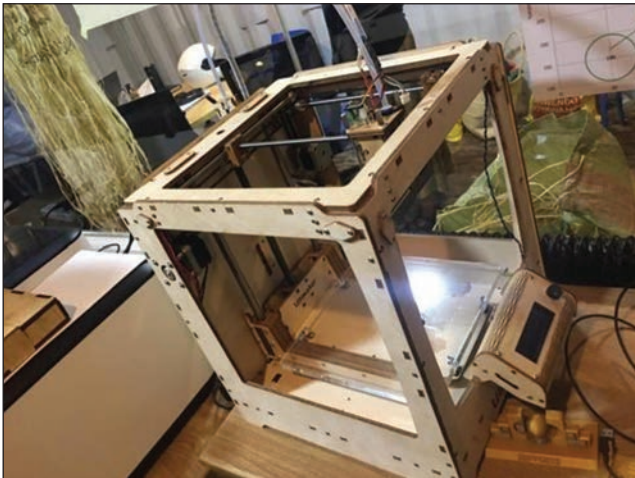
(Below is our event's program.)

The participants were very ecstatic and anxious for the days that followed, having been teased by the exciting things technology and just mere light can do, and some already felt like Mr. Stark of Ironman having played games in virtual reality. These sessions were held in partnership with MOTIV Uganda and namunde Labs who gave us access to their premises and resources, which made all the activities a success.

The event was culminated with a photonics student challenge that saw Edwin Banura win the contest, with Were Bill and Ayebare Cynthia coming in second and third respectively. The first, second, and third prize winners each received \$40, \$25, and \$10, respectively. The first three winners will have their 2021 IEEE Photonics Society membership fee fully catered for, and those members that participated also will receive half off of the membership fee.

With all the exposure delivered through the photonics week, student members are so eager to take part in more

Date	Activity	Time	Venue	Leader
28th Oct, 2020	Webinar	3 pm–4 pm	Zoom	Baron Ezabo
30th Oct, 2020	Laser cutting	10 am–4 pm	Motiv	Charlie Chalmers
30th Oct, 2020	Virtual Reality	2 pm–5 pm	Motiv	Adeline Tushabe
31st Oct, 2020	Matlab, Image and Processing Research Perspective	4 pm–5 pm	Zoom Meeting	Prof. Arun M (India) Moderator: Rhodah Behaireyo
1st Nov. 2020	Robotics	10 am–4 pm	Noma house, Kyambogo	Eng. Vincent Olema
2nd Nov. 2020	Adoption of Photonics in Research Africa	6 pm–7 pm	Zoom Meeting	Kithinji Muriungi (Kenya)
4th Nov. 2020	The final Student Photonics Competition	4 pm–6 pm	Zoom Meeting	Dan Ahimbisibwe Indhumathi Gunasekaran (India)



activities even at an international level. We look forward to more activities like this to keep us technically current and relevant in development of the engineering profession through science and innovation.

In conclusion, we would like to thank the IEEE Kyambogo Student Branch, IEEE Uganda Section and IEEE Photonics Society for the support and dedication offered by the various

members who transformed the dream of this week into a reality. We cannot forget to thank Ahimbisibwe Dan our current chair IEEE Kyambogo University Photonics Society. He is the brain behind the IEEE Kyambogo University Photonics Week and hope the event can be carried out on annual basis.

Thank you
Happy 2021

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The Golden Circle

Why, How and What of a 'Women in Photonics' Chapter

Written by: Juthika Basak, IEEE Women in Photonics Silicon Valley

"Relationships are all there is. Everything in the universe only exists because it is in relationship to everything else. Nothing exists in isolation. We have to stop pretending we are individuals that can go it alone."—Margaret J. Wheatley.

The year 2020 was, undoubtedly, a year unparalleled in the recent past. The forced isolation we have all faced, albeit in varying degrees, had strengthened the need to identify with a community, to seek and build positive relationships.

Involvement with the IEEE Photonics Society offers the possibility of building such relationships within a professional community. This is an organization "where scientific and engineering advances in photonics are shared and nurtured," as quoted in its goals. But more importantly, it's a global organization whose leaders, members and volunteers are all committed to the goal of diversity and inclusion like no other. Its members, diligently and persistently, talk the talk and walk the walk.

During 2014–2015, Dr. Dalma Novak, then the President of the IEEE Photonics Society, launched the Women in Photonics Initiative. Along with two of my women colleagues at Infinera, and three others, from HP Labs, CST (now part of Dassault Systems) and the Stanford Photonics Research Center (SPRC), we established the local IEEE Women in Photonics Silicon Valley Chapter in April 2015. With myself being an Executive committee member of the local IEEE Photonics Society Santa Clara Chapter at the time, we received good support and advice on setting up the organization with minimal administrative add-ons.

As a team, we agreed on the following mission and goals for our chapter*:

- To provide a platform for networking, career growth and development in the field of photonics for women at different points of their career.
- To foster collaborations and conversations amongst women in academia and industry.
- To encourage and retain women in the field of photonics and optics



Our first event, "Breaking Through Perceptions," was held at the Conference for Lasers and Electro-optics (CLEO), 2015 in San Jose. Our invited speakers were Dr. Michal Lipson, Professor at Columbia University, who was traveling to San Jose for the conference and Dr. Hong Liu, Principal Engineer from Google. We started with a short talk by each speaker on how the differences in women's approaches or thought processes sometimes result in their actions or words being perceived incorrectly. The talk was followed by an interactive Question and Answer session with a highly engaged audience about how to recognize these false perceptions and address them effectively.

Since then, we have organized several other events, including a company on-site visit with a live demonstration of telecommunications equipment, a speed mentoring session, panel discussions and several outreach programs for middle and high school girls, called MakeHER workshops organized in collaboration with local libraries and STEM programs encouraging diversity.

Our most recent event held in December 2020, was a virtual fireside chat with Dr. Alexis Bjorlin, Senior Vice President at Broadcom and General Manager of their Optical Systems Division. She spoke on the topic of "Looking through the Glass Wall," and seeking out roles that provide diverse experiences, in both the technical and business aspects of photonics applications. Specifically, she emphasized that managing Profit and





Loss (P&L) responsibilities of a business unit were essential qualifications for women aspiring for the C-suite, including CEO positions.

One of the key aspects we pay attention to during the conception and planning of our events, is to allow for interactions amongst the audience. During preparation for the event we discuss with our speakers and panelists the key messages we would like to deliver. The dialogues and discussions are guided by our esteemed and experienced speakers and coordinated by our moderators. From the reactions and feedback we receive, it is evident that the participants find the ethos at the events to be safe and inclusive, where they can speak candidly, ask difficult questions and share personal struggles and victories. Participants walk away feeling that their experiences, questions and doubts are not unique to them and feel empowered in the process. Several establish connections with others in the room and continue to stay in touch long after.

For those of us who volunteer, all of these advantages are multiplied because of our increased interactions with members of the core organization team, as well as the guest speakers/panelists themselves. As we research and discuss topics for events, our awareness of existing micro-inequities and techniques to tackle them grows quickly. Over the years, we often find that we have shaped our careers positively as a result of this constant learning.

There continue to be uncertainties ahead for the year 2021. However, we are committed to bringing in more events, even if virtually while stay-at-home orders persist. Although the virtual nature of the events does limit the opportunities of network-



ing typically expected from a local chapter, it still seems to encourage a larger participation. One of the reasons might be the relatively easier access from home and reduced co-ordination issues with other typical commitments. This situation is certainly temporary, but in the meantime, we may hope that the virtual platform helps women attendees connect from across the world and build a truly global 'optical network' for themselves!

*Further information about our team, goals and activities can be found on our website: <https://wiphotonics.weebly.com/>

Acknowledgements: The title of this article is inspired by Simon Sinek's TED talk and book, "Start with Why."

Human Relationships Matter in Photonics

By *Patryk Urban, IEEE Photonics Poland Chairman*



In this series partnered with WaveJobs we invite people at different career stages to share about their experience in Photonics and lessons-learned in professional development. Today we interview Piotr Węgrzyn from the International Centre for Translational Eye Imaging in Warsaw and University of Warsaw in Poland, PhD researcher and a co-founder of Candela Foundation supporting young researchers.

Patryk: What is the field and scope of your activities in Photonics? What have you worked on recently and in the past? Your biggest achievements so far?

Piotr: I am shining a laser into people's eyes and trying to see what comes out. In other words, I am working on optical coherence tomography for retinal imaging. My research combines ultrafast cameras and different modulation techniques to enhance the performance of the full-field OCT. Previously I worked at ICFO in Barcelona where I was developing optical monitoring systems for neonatal intensive care units.

My most significant achievement so far is not related to technical aspects of photonics. I am proud that I managed to build and lead a great team of individuals who together formed KNOF-UW (local IEEE Photonics Student Chapter at the University of Warsaw). Together we proposed and implemented initiatives which supported our local community through outreach, professional development and networking like the Mini-Modes Photonics School—a weekend conference for students where we provided dedicated grants for young parents, which enabled them to participate with their children and partners.

Patryk: Would you consider shifting between academia and industry in future?

Piotr: It may surprise you, but I did not start working in photonics because I was amazed by the beauty of light and optical experimentation. What brought me to this research area was the local student community which stood out with its activities right at the University. Now, I am all in for both.

For the moment I know that I want to move to industry to gain some experience—firstly, to shape my own opinion of how it looks and, secondly, to learn a different approach to problem-solving.

One of the most important opportunities which arose from my involvement in KNOF-UW was meeting many amazing

people who achieved significant success and are actively sharing their experience. I am proud that we, me and my partners in crime, managed to convince these people to establish the Candela Foundation with us (candela.org.pl), which will be supporting young researchers who decide to develop optics and photonics in Poland. Our goal is to propose and implement community inspired programs that will provide help where it can make the most significant impact.

Patryk: What are the main obstacles you or your peers usually encounter when searching for a new job opportunity?

Piotr: The accessibility of jobs offers. It is tough to find offers related to photonics because they are often hidden under different job descriptions or are simply not published online. It is great to see that new initiatives, such as WaveJobs, aim to help young people looking for new job opportunities, and we also want to do our best to help others in this important area.

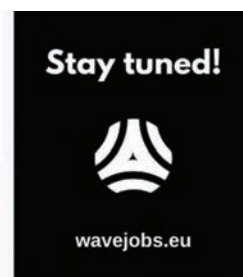
Patryk: I see your current efforts in photonics are not only related to your daily work but as part of your professional life, you are doing more for the community. Please, tell us more about your volunteer endeavours.

Piotr: During the four years of my involvement, I grew both professionally and personally. I am proud to say that the aforementioned organisation, the KNOF-UW, redefined its role in the local community during my leadership and vastly increased its range of activities. In January 2021, after 4 years, my term as board member came to an end. I gained a lot of experience in managing a group of physicists and understood the importance of good communication. It may sound underwhelming, but now I know that this is a real game-changer. On top of that, I met many people who now I can safely call real friends.

Patryk: Is there any piece of advice you would give to those considering entering university to study photonics for their Master's degree?

Piotr: If you have any doubts, find someone from the university and ask them about their experience. Simply write an email. Student organisations are a great starting point, and they will be happy to help you. One of the most surprising things that I learned is that people in photonics are very helpful. When it comes to students, even the busiest professors will always find the time to help them—even the ones they have never even met.

Patryk: Piotr, thank you very much, I wish you good luck in your career in Photonics and on behalf of our community I thank you for supporting the Society with your efforts.



Conference

The 2020 IEEE Photonics Conference (IPC) Post Highlights

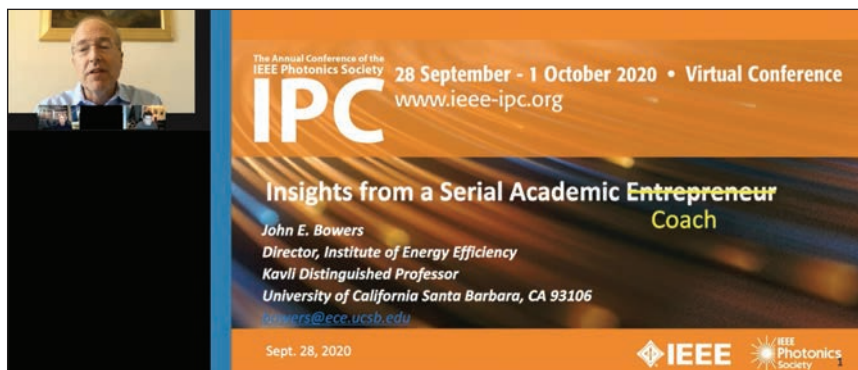
Zetian Mi, Christina Lim, Dominique Dagenais, and Weidong Zhou

The 2020 IEEE Photonics Conference (IPC) took place in a first-ever, all-virtual format from September 28, to October 1, 2020. As the IEEE Photonics Society's flagship conference, IPC attracts the broad photonics community worldwide and serves as a prominent meeting for its members.

This year plenary speakers Connie Chang-Hasnain, of University of California—Berkeley (USA), Paul Corkum, of University of Ottawa (Canada), Mordechai Segev, of Technion—Israel Institute of Technology (Israel), and Chris Koeppen, of II-VI Incorporated (USA), covered a broad range of topics: VCSEL array for 3D sensing; using light to control electrons; topological photonics; etc.

The technical program included 7 tutorials, 100 invited presentations, and 250 contributed papers from experts in Biophotonics, Nanophotonics, Silicon Photonics, Microwave Photonics, Quantum Photonics, Photonics Materials, Linear and nonlinear Photonics, and Photonics devices, optical communications and optical interconnect. New to IPC 2020 was the “Microwave Photonics—Avionics and Vehicular Fiber-Optics & Photonics (MWP-AVFOP)” topic, which covered recent advances in the field of fiber optic and microwave photonic components and systems on a variety of commercial, mobile, and military platforms. For the first time, IPC 2020 included the full conference program of IEEE Optical Interconnects (OI) Conference, as well as paper submissions for IEEE Group IV Photonics (GFP) Conference. There were also three Special Symposia, including Electroluminescent Quantum Dot Displays and OLED Lighting, Machine Learning in Photonic Systems, and Optical Frequency Combs.

For a third consecutive year IPC offered an industry forum, a series of talks dedicated to bring visibility to leading photonics technologies and transitioning technologies to the marketplace.



The virtual format allowed the opportunity to broaden attendance globally, boasting a record attendance of 2000+ participants. Though we could not meet in-person, with pre-recorded presentations and live Q&A, attendees were encouraged to interact in real-time with presenters. All technical sessions were available for unlimited, on-demand viewing for thirty days after IPC concluded.

Virtual Lab Tours

Nicolas Fontaine and Fatima Garcia-Gunning

The virtual lab tours showed the scientific process in action from inside labs around the world! We asked different research groups from around the world to prepare a 5 minute video showing off their laboratories and the people, especially young researchers, inside it. After each video, we took questions from the audience and discussed activities, challenges and strengths for further five minutes. These events took place at both the IEEE Photonics Society Annual meeting IPC 2020) and the 46th European Conference on Optical Communications (ECOC 2020) and were highlights of each conference.

The first event was at IPC. It was our trial run! We had five groups present from

- “Fiber Fabrication lab”, University of Central Florida, USA
- “Optical Networks Group”, University College London, UK
- “Optical coherence tomography and imaging through MMF for biomedical applications”, Massachusetts Institute of Technology, USA
- “Terabit Optical Networking Lab”, Georgia Institute of Technology, USA
- “Quantum Optics with Structured Light”, University of the Witwatersrand, South Africa

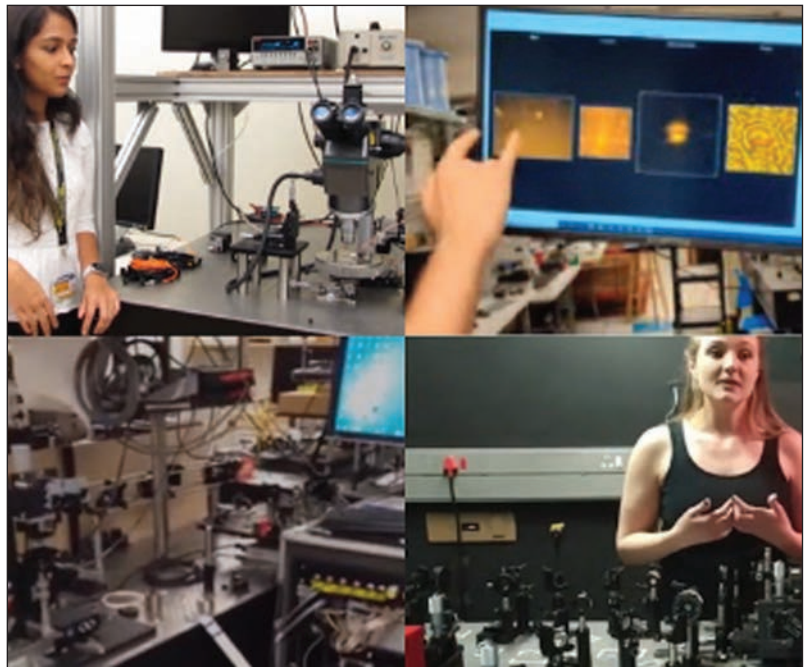
The second event was at ECOC and was split into two sections to facilitate participation across different time zones.

Tuesday section, with participation from Europe, Japan, Australia, China:

- “Optical Networks Group research on aspects on high-speed intelligent optical systems and networks”, University College London, United Kingdom
- “NICT Virtual Lab Tour”, National Institute of Information and Communications Technology, Network Research Institute, Japan
- “Photonic Research Centre of the Hong Kong Polytechnic University: from fibre to system”, Hong Kong Polytechnic University, Hong Kong
- “Soliton Laser Lab”, University of Sydney, Australia
- “Device fabrication lab and device testing”, Shanghai Jiao Tong University, China
- “Photonic Packaging Lab”, Tyndall National Institute, Ireland
- “Spatial Manipulation of Light”, University of Queensland, Australia

Wednesday section, with participation from: Europe, Mexico, Brazil, South Africa, USA

- “Fiber Devices and Fiber Fabrication”, University of Central Florida—USA
- “Optical Laboratories in Mexico”, UNAM and INAOE, Mexico
- “Systems labs and Device Labs”, Eindhoven University of Technology (TuE)—Netherlands



- “A brief visit to some Brazilian Photonics Laboratories”, CPQD’s Optical Communications Labs—CPqD, Campinas & “Ultrashort Fiber laser with Graphene—MackGraphe” ***—Mackenzie Presbyterian University, Sao Paulo, Brazil
- “Specialty Optical Fibres: Fabrication and Applications”, University of Southampton, United Kingdom
- “Classical & Quantum Structured Light”, University of the Witwatersrand, South Africa.

Every lab tour was original, filmed with a different perspective and really captured the various cultures from around the world. These videos captured the diversity of photonics research which span topics including fibers, photonic devices and packaging, quantum, bio-inspired and medical applications, and lasers. There are industry, government, and academic labs in probably every country in the world. We watched researchers going into their labs, showing their tools and experimental setups, how different researchers work together on similar projects, how to solve lab-related challenges, and even the food they enjoy after a successful experiment!

Virtual lab tours complement our existing scientific publications, journals and conferences. Traditional publications show a polished description of some problem the authors are trying to solve, the authors’ brilliant idea to solve this problem and then some simplified experimental setup to test their hypothesis. Papers are great for a seasoned researcher who already knows how to conduct experiments, but for a young researcher or for someone exploring a new field these may leave a lot of unanswered questions. Such as, what does that black box that says “f2f-OFC” look like? How did the other box that says “single-photon detector” get put together? Why did you use a scotch tape to hold your fiber? What does “Alice” look like and who

is “Bob”? What is a photonic lantern? Where do you put a 10kW laser?

Prof Joel Carpenter, a presenter and professor at the University of Queensland said: “As a presenter, it’s a good way to promote your lab and to advertise the kind of work you do, the members of your team and the facilities you have access to. As the audience watching the tour, you get to at least briefly familiarize yourself with many geographically spread out labs in a short amount of time at zero cost. These videos could also serve as a taste for deciding on labs you’d like to physically visit in the future.”

Prof Polina Bayvel, Head of the Optical Networks Group and also professor at University College London (UK), said: “The labs tours were a highlight of the recent ECOC and IPC.

Compiled with wit and skill, they provided a ‘virtual peek’ into many leading international labs, and radiated the enthusiasm and energy of the PhD students and postdocs as well as the often conflicting demands of the faculty staff who lead these! They also gave a rare opportunity to see into the workings of so many leading groups, spanning the wide field of photonics and optical communications. Hugely beneficial for both viewers and those of us involved in making the videos. More, please!”

The Virtual Lab Tours were a great success enjoyed by all, and more to come! Expect to see the virtual lab tour event evolve into more conferences and for them to become even more interesting! You can find the events on the IEEE Photonics Society website: <https://www.photonicsociety.org/> and the ECOC website: <https://www.ecoco2020.org/>.

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Publications

Meet the New Editor-in-Chief of the Journal of Lightwave Technology

Gabriella Bosco is a Professor in the Department of Electronics and Telecommunications at Politecnico di Torino, Italy. She is a member of the IEEE Photonics Society Board of Governors (2021–2023), and she is currently serving as the Editor-in-Chief of the IEEE/OSA Journal of Lightwave Technology (JLT), having previously served as Associate Editor from 2014 to 2017 and as Deputy Editor in 2018.



She received the Ph.D. degree in electronic and communication engineering from Politecnico di Torino in 2002. In 2000, she was a Visiting Researcher with the University of California at Santa Barbara. From 1998 to 2011, she held a Postdoctoral position in the OptCom Group at Politecnico di Torino, where she worked as an Assistant Professor from 2011 to 2014 and as an Associate Professor from 2014 to 2020. From 2015 to 2019, she was an elected member of the Academic Senate of Politecnico di Torino. Her main research interests include the performance analysis and design of optical transmission systems and the application of digital signal processing and advanced modulation techniques in optical links.

She has co-authored several book chapters and more than 200 peer-reviewed papers in leading journals and conferences. She was one of the winners of the IEEE/OSA Journal of Lightwave Technology “Best Paper Award” in 2014 and 2015. Since 2011, she has served on the program committee of several international conferences, among which are the Conference on Lasers and Electro-Optics (CLEO), the IEEE Photonics Society’s Annual Meeting (IPC) and the Optical Fiber Communi-

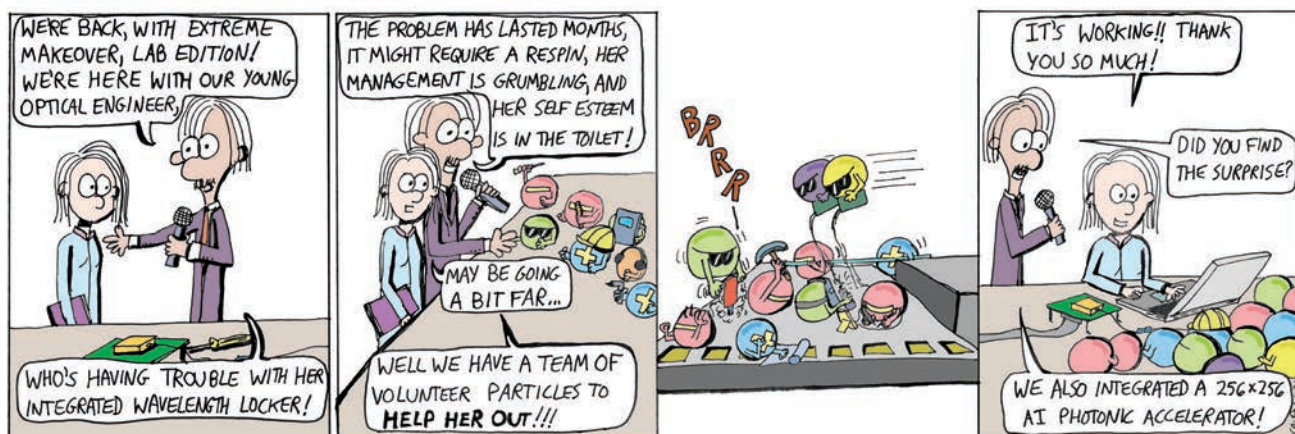
cation conference (OFC), for which she acted as Program Chair in 2017 and General Chair in 2019. She was elevated to Fellow of the OSA in 2017 and of the IEEE in 2019, for contributions to modeling and design of coherent optical communication systems.

“It was a great honor to be selected as the new Editor-in-Chief (EiC) of JLT in 2019 and to be able to build upon the job so successfully carried out by Dr. Peter Winzer in the previous years. Since its inception in 1983, JLT has been the premier journal in the field of optical waveguide technologies and their applications, ranging from fiber and cable technologies to integrated photonics, from active and passive guided-wave components to optical systems and networks. The main goals that I would like to accomplish during my EiC term are:

“Further increase the stature of JLT in terms of impact across all its co-sponsoring societies and within the scientific community at large, encouraging the authors to submit their best papers to JLT.

- *Keep the quality of the published papers high, further enforcing a strict, yet reasonable, quality control based on the selection of technically strong Editorial Board members.*
- *Help JLT expand into emerging guided-wave technologies, using “special issues” as the vehicle for this expansion.*
- *Cement JLT’s leadership in its core technical areas and continue the tradition of publishing special issues from the most prestigious conferences worldwide, such as OFC, ECOC, OFS, and MWP.*
- *Increase the public visibility of the journal and its initiatives through an active use of social media managed by the JLT Publicity Editor.”*

Cartoon



Call for Papers

Announcing an Issue of the IEEE
JOURNAL OF SELECTED TOPICS IN QUANTUM ELECTRONICS on

Semiconductor Lasers

Submission Deadline: April 1, 2021
Hard Copy Publication: January/February 2022

The **IEEE Journal of Selected Topics in Quantum Electronics** (JSTQE) invites manuscript submissions in the area of **Semiconductor Lasers**. Topics can include:

- UVB and UVC lasers, and quantum interband or intersubband cascade lasers, to extend operation wavelengths further into the ultra-violet and terahertz;
- Nanoscale, sub-wavelength sized lasers;
- Vertically emitting lasers, such as VCSELs, external cavity surface emitting lasers, and disc lasers;
- High-power lasers, including beam combining, single-wavelength and multi-wavelength lasers, mode-locked and Q-switched lasers, and directly-modulated lasers;
- Lasers based on novel semiconductor materials, such as germanium and silicon, transition-metal dichalcogenide, solution processed gain, and/or novel heterostructures, such as quantum dot, well and wire lasers;
- Laser modeling and experimental characterization of, for example, gain, noise, nonlinearities and dynamics;
- Integration of lasers on existing and non-native integration platforms, such as silicon and silicon nitride, through, e.g., wafer-bonding, transfer printing, and heteroepitaxy, and laser-enabled photonic integrated circuits.

The Primary Guest Editor for this issue is **Martijn Heck**, Aarhus University, Denmark, and Eindhoven University of Technology, the Netherlands. The Guest Editors are: **Qing Gu**, The University of Texas at Dallas, USA; **Åsa Haglund**, Chalmers University of Technology, Sweden; **Jonathan Klamkin**, University of California Santa Barbara, USA; **Shinji Matsuo**, NTT, Japan; and **Marc Sciamanna**, CentraleSupélec, France.



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Call for Papers

Announcing an Issue of the IEEE

JOURNAL OF SELECTED TOPICS IN QUANTUM ELECTRONICS on

Optical Detectors

Submission Deadline: June 1, 2021

Hard Copy Publication: March/April 2022

The IEEE Journal of Selected Topics in Quantum Electronics (JSTQE) invites manuscript submissions in **Optical Detectors**. The field of **Optical Detectors** is one of the most fundamental research areas in engineering for detection of the light across the optical spectrum from ultraviolet to long-wavelength infrared. Novel applications and the increasingly stringent requirements in optical sensing, imaging, and communications have driven continuous developments in material science and device design. In addition, recent progress of photonic integrated circuits has enabled the development of large-scale, cost-effective detector architectures with enhanced functionality. The *IEEE Journal of Selected Topics in Quantum Electronics* invites manuscript submissions in the area of **Optical Detectors**. The purpose of this issue of JSTQE is to highlight recent progress and trends in innovative optical detector technology and its applications. Areas of interest include (but are not limited to):

- High-speed and high-power photodiodes and photomixers
- Detectors and detector arrays for UV, visible, and IR detection
- Avalanche photodiodes and single-photon detectors
- Optical detectors based on novel materials and substrates
- Photodetectors in photonic integrated circuits using monolithic, heterogeneous or hybrid integration technologies
- Coherent optical receivers for the detection of advanced modulation formats
- Microwave photodiodes for analog applications
- Optical detectors with applications in optical communications, infrared imagers, and quantum communications
- Integrated photodetectors for sensing applications

The Primary Guest Editor for this issue is **Atsushi Kanno**, NICT, Japan. The Guest Editors are: **Andreas Beling**, University of Virginia, USA; **Kazutoshi Kato**, Kyushu University, Japan; **Christina Lim**, The University of Melbourne, Australia; **Patrick Runge**, Fraunhofer Heinrich Hertz Institute HHI, Germany.

The deadline for submission of manuscripts is **June 1, 2021**. Hardcopy publication of the issue is scheduled for **March/April 2022**.

Call for Papers

Announcing an Issue of the IEEE

JOURNAL OF SELECTED TOPICS IN QUANTUM ELECTRONICS on
Hybrid Integration for Silicon Photonics

Submission Deadline: August 1, 2021

Hard Copy Publication: May/June 2022

The IEEE Journal of Selected Topics in Quantum Electronics (JSTQE) invites manuscript submissions in **Hybrid Integration for Silicon Photonics** which is an advanced field of modern photonic integrated circuit (PIC) development by large scale accompanied with the ever added functionalities through the heterogenous integration and packaging by incorporating various best in-class materials and chips/chip-lets in order to meet the future products with new application demands, beyond the current industry focus on optical-interconnects centric transceiver alike. The **IEEE Journal of Selected Topics in Quantum Electronics** (JSTQE) invites manuscript submissions in the area of **Hybrid integration for Silicon Photonics**. The purpose of this issue of JSTQE is to highlight the recent progress in both research and development trend and industrial product implementation prospects, challenges and opportunities ahead, especially the new application demands and requirements on hybrid photonics platforms. Areas of interest include (but not limited to):

- Silicon photonics hybrid integration and advancement
- Heterogeneous integration scheme, such as through: Growth, Bonding, Membrane Transfer, etc.
- Silica, silicon nitride-, AlN-photonics, etc.
- Hybrid Integrated materials, such as: InP, LiNbO_x, VO_x, Magneto-optic material, Phase-Change-Materials, etc.
- Optical-, Opto-Electronics interposers, and chip-lets, Co-Packaging
- Advanced Active Devices, e.g., Modulators, Tunable lasers
- Optical interconnects, telecommunications
- Microwave photonics
- Photonic sensors, LiDAR
- Optical Computing, AI and Deep-Learning
- Quantum Photonics and Applications
- Hybrid Integration and O/E IC Packaging (incl. Co-Packaging)
- Product Development effort and Status

The Primary Guest Editor for this issue is **Patrick Lo Guo-Qiang**, Advanced Micro-Foundry Pte Ltd, Singapore. The Guest Editors are: **Prof. Juejun Hu**, MIT/USA; **Dr. Xianshu Luo**, AMF/Singapore; **Prof. Joyce Poon**, Max Planck Institute of Microstructure Physics, Germany and University of Toronto/Canada; **Prof. Dries Van Thourhout**, Ghent University – IMEC/Belgium; **Prof. Fengnian Xia**, Yale University/USA.

The deadline for submission of manuscripts is **August 1, 2021**. Hardcopy publication of the issue is scheduled for **May/June 2022**.

Call for Papers

Announcing an Issue of the IEEE

JOURNAL OF SELECTED TOPICS IN QUANTUM ELECTRONICS on

Machine Learning in Photonic Communication and Measurement Systems

Submission Deadline: October 1, 2021

Hard Copy Publication: July/August 2022

The IEEE Journal of Selected Topics in Quantum Electronics (JSTQE) invites manuscript submissions in **Machine Learning for Photonic Communication and Measurements Systems**. Introducing intelligence as well as using machine learning to design the next generation of components and systems as well as measurement systems is an emerging line of research in the photonics community. The hope is that the machine learning will enable a new generation of transformative photonic components and systems that can outperform current solutions in terms of performance, flexibility, reconfigurability and power consumption. The strength of machine learning is to find effective solutions for problems that are highly complex such as; realizing power efficient long-reach high-throughput optical communication systems, low-noise lasers, repetition rate and spectrally reconfigurable optical frequency combs, multi-purpose photonic integrated circuits, secure communication systems and performing measurements at the quantum limit. The purpose of this issue of JSTQE is to highlight the recent progress and trends in utilizing machine learning techniques for developing next-generation of photonic communication and measurements systems. Areas of interest include (but are not limited to):

Optical components

- Semiconductor and fibre based lasers devices
- Optical frequency combs
- Programmable multi-purpose photonic integrated circuits
- Fibers
- Optical amplifiers

Optical communication systems

- Flexible transmitters
- Constellation shaping
- Spectrum shaping
- Fiber-optic channel impairment mitigation
- Free-space optics

Classical and quantum measurement systems

- Biomedical imaging
- Characterization of lasers and frequency combs
- Quantum limited phase sensing
- Quantum key distribution
- State estimation in cavity opto-mechanics

Optical networks

- Performance monitoring
- Optimization
- Security

The Primary Guest Editor for this issue is **Darko Zibar**, Technical University of Denmark. The Guest Editors are: **Sergei Turitsyn**, Aston University, United Kingdom; **Bahram Jalali**, University of California Los Angeles (UCLA), USA; **Keisuke Kojima**, Mitsubishi Research Laboratory, (MERL), Boston, USA and **Marija Furdek**, Chalmers University of Technology.

The deadline for submission of manuscripts is **October 1, 2021**. Hardcopy publication of the issue is scheduled for **July/August 2022**.

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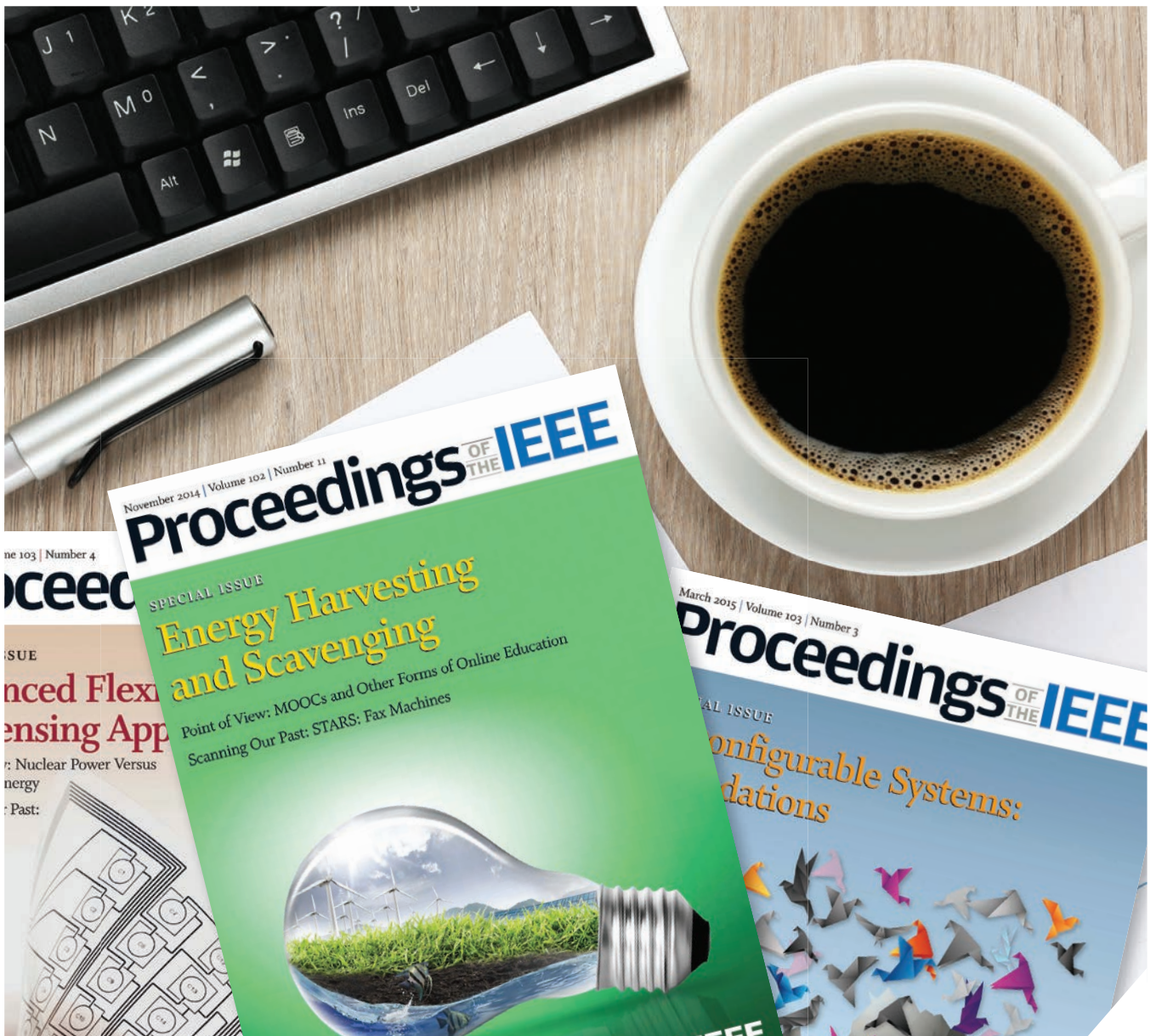
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- PDF manuscript (double column format, up to 12 pages for an invited paper, up to 8 pages for a contributed paper). Manuscripts over the standard page limit will have an overlength charge of \$220.00 per page imposed. Biographies of ALL authors are mandatory, photographs are optional.
- See the Tools for Authors link:
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Photonics Society shall advance the interests of its members and the laser, optoelectronics, and photonics professional community by:

- providing opportunities for information exchange, continuing education, and professional growth;
- publishing journals, sponsoring conferences, and supporting local chapter and student activities;
- formally recognizing the professional contributions of members;
- representing the laser, optoelectronics, and photonics community and serving as its advocate within the IEEE, the broader scientific and technical community, and society at large.

Photonics Society Field of Interest

The Society's Field of Interest is lasers, optical and photonic devices, optical fibers, and associated lightwave technology and their systems and applications. The society is concerned with transforming the science of materials, optical phenomena, and quantum electronic devices into the design, development, and manufacture of photonic technologies. The Society promotes and cooperates in the educational and technical activities which contribute to the useful expansion of the field of quantum opto-electronics and applications.

The Society shall aid in promoting close cooperation with other IEEE societies and councils in the form of joint publications, sponsorships of meetings, and other forms of information exchange. Appropriate cooperative efforts will also be undertaken with non-IEEE societies.

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The IEEE Photonics Journal welcomes original contributions addressing issues ranging from fundamental understanding to emerging technologies and applications.

The Journal includes topics in:

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- Integrated optics and optoelectronic
- Ultrafast, attosecond, high field and short wavelength photonics
- Biophotonics, including DNA photonics
- Nanophotonics
- Fundamentals of light propagation and interaction; nonlinear effects
- Optical data storage
- Fiber optics and optical communications devices, systems, and technologies
- Micro Opto Electro Mechanical Systems (MOEMS)
- Microwave photonics
- Optical Sensors

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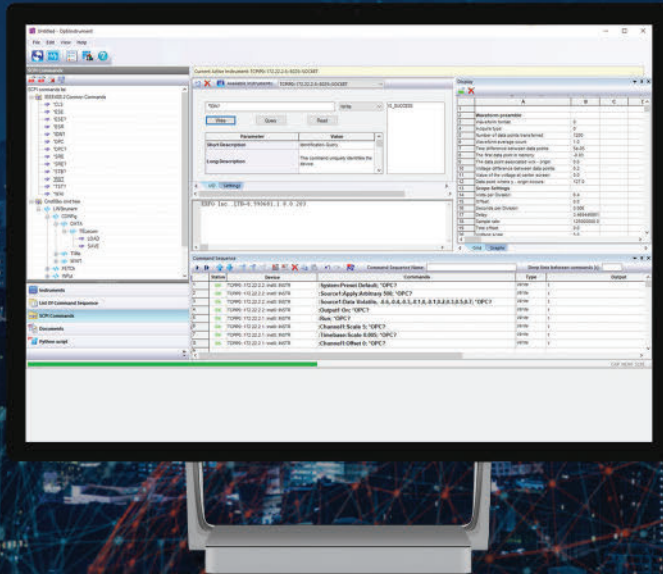
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- Remote operation and control of instruments
- Save results of executed SCPI command(s) in a CSV file
- Support dockable windows

Application:

- Remotely communicate with instruments
- Setup parameters of equipment
- Automate testing and characterization
- View generated signals
- Extract & save the data of generated signals for post processing
- Integrate instruments with photonics and systems simulation tools

