Marina Radulaski @MarinaRadulaski

Having fun at the #POM20 @OpticsUCDavis hub

@PhotonicsMeetup @ucdavis @UCDavisECE @UCDavisBME

POM Bingo – UC Davis Hub

Applause after a talk	Exciton	Neural network	Single photon emission	Hanbury Brown-Twiss
Teleportation	Refraction	Cold atoms	Integrated	Technical issues
Nanoparticle	Cat enters screen	Waveguide	Quantum dot	Terahertz
Microwaves	Topology	Hong-Ou-Mandel	Tweet local hub photo	Lunch arrives
Photonics	Polymer	Projector overheats	Online question asked	Metamaterial

Beth Tennyson @beth_tennyson

Excited to experience our first virtual conference :) @jordiferrero97 and I as the @StranksLab representation at @PhotonicsMeetup! #POM20

**Mikhail Kats** @mickeykats

How many academic conferences are pet friendly?!

@PhotonicsMeetup #POM20

Mete Atature @MeteAtature

Replying to @mickeykats and @PhotonicsMeetup

:)))))) #Mietziko thanks the organisers of this cat-friendly organisation! 🐱

Alina @AlinaBruma1

3 am in Bombay, India and people are not giving up, still attending lectures focused on photonics!

Pretty impressive effort!

@PhotonicsMeetup #POM20
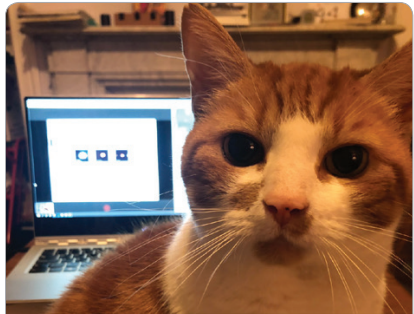
photonics.iitb @photonicsiitb · Jan 13

Its morning 03:00 am still IIT Bombay is enjoying the POM 2020 @photonicsmeetup #POM20

Michele Celebrano @vynisle

...and prize for the most unusual location goes to... I am traveling home but did not wanted to miss @NaderEngheta talk! #POM20
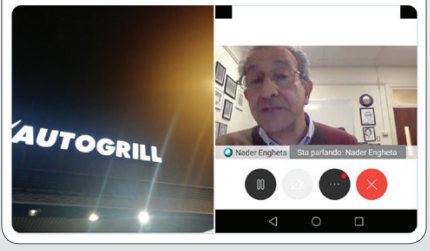
Joerg Heber @joergheber

Had a wonderful time today attending the entirely virtual @PhotonicsMeetup #pom20. First of its kind in this field! Worked really well - so much enthusiasm at the hubs across all convenient and inconvenient time zones. This concept points to the future!

Eric Mazur @eric_mazur

The future of online meetings has come to #photonics (and the world more broadly)! Check out this Twitter Poster Session at the #POM20 Photonics Online Meeting 2020. Thanks to co-chairs @Orad & @ProfArmani ow.ly/AVZ030q8rW3

John Dudley
@johnmdudley

If you're feeling a bit at a loss what to do this afternoon, I cannot recommend strongly enough to have a look at the online posters that are part of #POM20 Brilliant @Orad @ProfArmani @sylvaingigan @igordownunder et al...

Molly Moser

POM
Photonics Online Meetup

The organizers and attendees of an all-virtual, free-of-charge scientific conference consider the future of the format.

On 13 January 2020, more than 1,100 people in 37 countries on six continents participated in a real-time, proof-of-concept experiment—an entirely virtual, and entirely free, scientific conference.

Dubbed the Photonics Online Meetup (or "POM," if you're conserving Twitter characters), the five-hour conference consisted of a virtual poster session, three invited talks and nine presentations in three broad topic areas: integrated optics, nanoscale quantum optics and optical materials. Video recordings of the presentations were made available online for two weeks following the conference for those unable to attend due to their time zone.

With the experiment complete, and the recorded video sessions scrubbed from the web, OPN spoke with POM's organizers and several attendees to reflect on the experience—and to explore digital communication's role in the future of conference culture.

Modern formats for modern science

The inspirations for POM were multifaceted. But all, according to conference co-chair and OSA Fellow Andrea Armani, University of Southern California, USA, sprang from classic conference-related commiserations, shared among scientists via the "free-form chaos that is Twitter."

"With all of the restrictions people are beginning to face, in terms of getting visas and increasing travel costs," the barriers for attending scientific conferences are growing higher and higher, Armani noted.
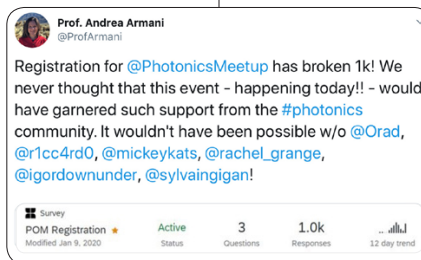
Such travel barriers can seem particularly insurmountable for students, who lack the funding to attend international meetings. "POM is a great idea to see what's out there in a very low-threshold barrier, especially for newer Ph.D. students," says OSA student member Camiel Op de Beeck, who attended the virtual conference with two dozen others at a "POM hub" at Ghent University in Belgium. At another hub, at the Polytechnic University of Milan, Italy, many of the student registrants had never attended an international conference before—and the US\$0 price tag attracted a whopping 50 participants.

For more senior researchers, another factor adding to the cost and headache of conference attendance is the pressure to attend every meeting that intersects with their expertise, to build their networks, form collaborations and stay on the cutting edge of their fields. "As research becomes more interdisciplinary," explains Armani, the interconnected landscape of modern science no longer allows this to be accomplished by traveling to one or two large conferences in a year.

Furthermore, as travel obligations inflate, so do researchers' carbon footprints. Some scientists are beginning to weigh the environmental costs of conference travel against the scientific benefit. The conference organizers cite multiple sources on POM's "Mission" web page (https://sites.usc.edu/pom/mission/) that call attention to this growing consciousness.

Increasingly, "for this myriad of reasons," says Armani, "being able to have conferences and share information online is just becoming a logical idea."

Photonics Online Meetup
@PhotonicsMeetup Follows you

The first all-online photonics conference. #POM20 will be on Jan 13, 2020 from 2 - 7 pm EST. Follow for more details! Tweets by chairs @Orad & @ProfArmani

⊙ Anywhere   🔗 sites.usc.edu/pom/   📅 Joined September 2019

Prof. Andrea Armani
@ProfArmani

Registration for @PhotonicsMeetup has broken 1k! We never thought that this event - happening today!! - would have garnered such support from the #photonics community. It wouldn't have been possible w/o @Orad, @r1cc4rd0, @mickeykats, @rachel_grange, @igordownunder, @sylvaingigan!

| Survey POM Registration ★ Modified Jan 9, 2020 | Active Status | 3 Questions | 1.0k Responses | 12 day trend |

Photonics Online Meetup
@PhotonicsMeetup

It seems the poster session is winding down! They're gonna be left up for as long as you need so enjoy perusing them over the weekend.

...and on Monday, don't forget to make time to see our exciting talks! The entire program can be found here: sites.usc.edu/pom/program/

Mete Atatüre
Nanoscale quantum optics

Mercedeh Khajavikhan
Integrated optics

Nader Engheta
Optical materials

Meet me at the hub

Spurred by these motivations, Armani and her fellow conference organizers decided to try out an all-virtual photonics conference—but they kept their expectations low. "The truth is that this really is an experiment," explained conference co-chair OSA member Orad Reshef, University of Ottawa, Canada. A few people could have registered, or thousands—"We didn't know what would happen."

The day-of turnout for POM far outstripped the organizers' initial (albeit modest) expectations. Armani says she would have counted 100 registrants as a victory; the actual number of participants was more than 10 times that. "We had bets," says Reshef, "on the number of registrants, abstract submissions—whoever bet the highest number always won."
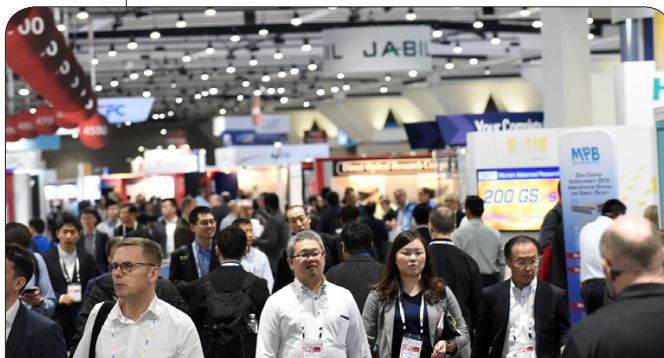
Of the 600 separate connections across the world that tuned into the virtual conference, 66 were at "POM hubs"—venues where groups of people could convene to experience the meeting together, rather than logging in alone from their own computer. The hub concept was intended to facilitate some of the face-to-face networking that is considered a key piece of traditional conferences.

The Ottawa hub, for example, brought together students, professors and researchers from the University of Ottawa, Carlton University and the National Research Council of Canada.

"It's the idea of trying to bridge local optics communities," says Armani. Particularly in big cities, she explains, there may be several major universities and research institutions within the same city limits. The hubs can "act as a catalyst to make these introductions, especially among the students," Armani believes, "to try to help them build networks among their peer groups."

Engaging students

Many hubs were located at universities and were hosted by OSA and SPIE student chapters. Indeed, over 50% of POM's attendees were students, a fact that Armani considers a particular success, as formal conferences can be intimidating places for students to ask questions. If during a POM talk, for example, a student had a question, then they

Suzanne Ffolkes
@Sffolkes

Remote 2-way participation via videoconferencing is now available for #OFC20 technical registrants for workshops, panels and more. Onsite and virtual participants will engage in new and innovative ways. Come join us! @ofcconference #optics

Raul Muñoz
@rmunoz7777

@CttcTech expedition on its way to #OFC20 conference in San Diego!! Mixed feelings. Sad because many colleagues will not join this time due to travel restrictions, but very excited with our 2 short courses, 1 invited paper, and 5 oral papers (1 top-scored). @ofcconference

OFC Expands Online Offerings

The POM organizers couldn't have known that just a few weeks after the event, health and travel concerns related to the rapid spread of a novel coronavirus would spawn an international crisis. As the virus has increased its reach and as travel restrictions have become common, the consequences of the mobility crisis have touched researchers, students and the scientific community in general—highlighting a previously unappreciated need for conference flexibility.

Such flexibility was on full display in mid-March, as the organizers of the Optical Networking and Communication Conference & Exhibition (OFC)—the field's biggest annual conference—responded with digital solutions and on-the-fly flexibility to help attendees and presenters whose travel plans were suddenly hijacked by the coronavirus situation. As a result, of the scheduled 700 peer-reviewed technical talks and presentations at OFC, over 90% were presented in-person or virtually—demonstrating, according to program chairs Jun Shan Wey, David Plant and Shinji Matsuo, "that large conferences can engage participants across the globe—using the optical fiber communications technologies developed by experts in the field."

"The research and innovations enabled by the OFC community," the chairs conclude, "have made OFC 2020 the perfect opportunity to run a virtual conference experiment."

could ask their professor—mid-talk—without distracting the speaker. In Armani's experience leading the USC hub, this environment was more interactive. "In this way," she says, "the students can learn a lot more."

At Ghent—where all 26 attendees were focused on integrated photonics, one of POM's three main themes—the hub infrastructure lent itself to internal, real-time discussions about the talks. "People had many active discussions among themselves while the talks were going on," says Op de Beeck. "They were critiquing the research, but they were also kind of getting inspired by looking at new ways of thinking about it."

At other hubs where the conference topics meshed less with the attendees' research interests, however, there was less-spirited conversation. Indeed, students at both the Polytechnic University of Milan and Ghent University were enthusiastic about POM's concept, but in retrospect, they had a few suggestions for how to improve student engagement.

As someone focused on ultrafast spectroscopy, which was not covered by POM's program, Chiara Trovatello, of the Milan OSA student chapter, thought that more parallel sessions on a variety of specific scientific topics would lead to more questions and more discussion. "It can be hard to participate in a broad session," she says, "more focused sessions would help." She also suggested that future speakers begin their talks with a brief introduction to the topic, for those who are interested in following along but are less familiar with the subfield.

At Ghent, Op de Beeck and OSA student member Khannan Rajendran agreed, suggesting that since the cost of hosting an online conference is relatively low, perhaps there could be a greater volume of "specialist meetings online." While at a traditional conference you try to attend as many talks as possible, they say, an online conference should be organized to appeal to a niche audience, or else attendees will stop streaming.

Inside the POM hubs: POM's digital format drew in a widespread, global crowd, but 66 central "hub" locations across the world still allowed for in-person networking opportunities for local photonics communities.

Into the Twitterverse

One aspect of POM that truly capitalized on the digital format was the virtual poster session. Conducted entirely via Twitter, the session kicked off a few days before the conference as dozens of groups spanning myriad time zones tweeted out their virtual posters. Those without Twitter could post via the POM account.

While a conventional conference poster is often a single, unwieldy piece of paper, each POM virtual poster consisted of a four-image collage, tweeted below a brief summary of the work and the conference hashtag #POM20. Interested parties could search the hashtag and like, share and comment on work they found particularly interesting.

At a typical poster session, the reach is limited by the number of people who view the work during the session's one-to-three-hour window, explains Armani. On Twitter, the poster can continue to circulate online "technically forever," she says. "It has a little more staying power." Some of the posters were retweeted over a dozen times, with some reaching 4000 views (and counting).

The nice thing about this format, adds Reshef, is that Twitter "already has a built in base." However, he notes, "we were not planning on doing a poster session from the onset." With over 100 submissions for just nine speaking slots, explains Reshef, "we had all of these great abstracts, and the poster session came out of necessity."

First pancake

While the POM experience exceeded many expectations, and the organizers did their best to get in front of potential drawbacks to the online format—such as the networking aspect—that's not to say that POM went off without a hitch. As the first of its kind in photonics, POM faced the classic "first pancake" quandary, and had to learn to balance multiple unforeseen hiccups in its trial run.
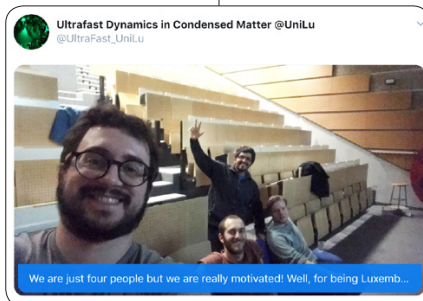
"The consistent negative comment we got had to do with the audio," explains Armani, "which we really tried to anticipate." Participants at the Ghent and Milan hubs reported audio woes as well—in part related to the fact that the conference speakers delivered their online talks in remote locations that ranged from their labs to their living rooms. "A few of the speakers had really good microphones," says Trovatello, "but when the sound quality was low, the talks were hard to follow."

The big "uh-oh" moment came when it was time for one of these remote sessions … and the presentation didn't load. However, that, shrugs Armani, "is a lesson learned." At the end of the day, it felt like a bigger deal than it was, agrees Reshef, since the presentation was simply swapped out for a later time slot.

Another aspect that fell short of expectations was the Q&A feature. As speakers delivered their talks, attendees were able to submit questions using Webex chat, which were then asked by the session chairs. Some attendees, however, found the steady stream of questions floating across the screen distracting. Also, in the hub environment, only one computer could submit questions, so in practice some found the format awkward. "We realize that the Q&A was not ideal," admits Armani, "so we're trying to look through alternative ways to have people engage with questions."

One of the different avenues the organizing team is exploring is using Twitter for Q&A. But Op de Beeck and Rajendran believe that POM's Q&A shortcomings could be cured by another social media platform—Reddit. Reddit's "upvote" tool allows users to click an up arrow if they like or agree with a comment. The more popular a comment, the higher up it appears in the comment list. The Ghent students believe that being able to upvote questions would organize the Q&A format, allow speakers to see and answer the audience's most pertinent questions.

"There were quite a few things that didn't go exactly as planned," Reshef admits, "but it's an experiment, and it's all done in good faith." At the end of the day, he says, "we're all friends doing this for the common good." Furthermore, the conference was free, and no one knew what to expect, jokes Reshef, "so people cut us a lot of slack."

POM 2.0?

So, in 10 years, will every scientific conference be virtual? Probably not—there's still much to be said for face-to-face community building and collaboration. But with strategic improvements to iron out the POM model, some believe that virtual meetings could fill an inclusivity and sustainability gap in the scientific-conference circuit.

Based on the POM experience, future online conferences will want to build on the inherent interactivity and enthusiasm of online communities, and explore more ways to inspire conversations. "It's an unnatural education" learning to take full advantage of digital resources to facilitate such interactions, reflects Reshef, "but it's something we're currently wrestling with."

As for POM in particular, the January experiment garnered enough excitement that the organizers are already planning for round two. And while the chairs say the timing is uncertain, the sequel could be coming to a screen near you as early as this summer. OPN

A social poster session: Some attendees felt that the true novelty of POM was hosting the virtual poster session on Twitter, which allowed for increased circulation and engagement with each poster.

Molly Moser (mmoser@osa.org) is OPN's associate editor.