



Robotics exhibit on the show floor.

OSA

ANNUAL MEETING

Science + Applications = FiO+LS 2017

Fittingly, the first annual meeting of OSA's second century embarked on a new, future-oriented path.

When 2017's five-day Frontiers in Optics + Laser Science (FiO+LS) conference ended on 21 September 2017 at the Washington, D.C., Hilton Hotel, the event also marked a beginning. For this year's meeting kicked off a new approach to FiO+LS—one focused on the applications that will drive the future, and on the power of optical science and industry to join forces in enabling them.

The new approach arose from significant soul-searching about the format and audience for FiO+LS, which combines the annual meeting of The Optical Society (OSA) with that of the American Physical Society's Division of Laser Science. "FiO has this history of being a broad meeting," said Steve Cundiff

of the University of Michigan, USA, a co-chair of the meeting's FiO component. But, he added, in an era when attendees are increasingly drawn to more specialized events, the meeting's broad portfolio was starting to create some challenges. "Looking at the landscape of these meetings, we wanted to find a way for FiO to stand out and thrive."

The new FiO+LS met this challenge head-on, zeroing in on "the intersection of science and applications." And it implemented that slogan through new technical themes, speaker series and presentation formats designed to spur interaction across disciplinary and industry-academia boundaries.

From “show floor” to showcase

The meeting’s new vibe was especially strong at that most essential of trade-show institutions, the exhibit floor. The organizers of FiO+LS 2017 sought to transform the Hilton’s Columbia Ballroom into nothing less than a “Science and Industry Showcase”—a

mash-up that brought together exhibiting companies and a vibrant set of scientific activities to build buzz and traffic.

Flanking the exhibitor area was a lively zone of poster presentations, including several “E-poster” setups that let selected presenters use multimedia to dive deeper into their research stories. Nearby, a “Science Showcase Theater” created a space for “rapid-fire” talks by a number of poster presenters, as well as special events such as a meet-and-greet with OSA’s journal editors. And several booths in the exhibitor area featured scientific demos, including a “Beyond R2D2” exhibit on medical robotics from Johns Hopkins University and a hydrogen-powered car from the U.S. Department of Energy.

“The idea was to create a hub of activity,” according to Melissa Russell, OSA’s chief industry relations officer. Russell added that the meeting’s organizers also set aside large blocks of “unopposed” time in the scientific schedule, giving attendees the chance to really explore the Showcase.

The setup seemed to pay off for both exhibitors and the audience at large. Groot Gregory, the technical marketing director for Synopsys, found the integration of scientific

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content and exhibitor booths “an effective way” to bring attendees to the floor. “Those direct interactions,” he said, “maximized our ability to connect with current and potential customers.” And FiO co-chair Susana Marcos of Consejo Superior de Investigaciones Científicas, Spain, added that the interactive and scientific elements on the floor “contributed to the networking and brainstorming between delegates.”

Jin Kang—who brought to the Showcase his lab’s demo on photonically enabled

(and exquisitely precise) robots for microsurgeries—said his team was “very excited” by the level of activity and interest. “We had a constant flow of people,” he reported. “Many were asking us basic questions about medical robotics, because it’s an area that people in photonics just are not familiar with.” For Kang, bridging that gap is an important goal, and the demo at FiO+LS helped advance it. “People were commenting, ‘maybe I should look into these applications,’” he said.

Revamped scientific program

Beyond the exhibit floor, the meeting’s organizers took a fresh look at its scientific agenda, with an eye toward a sharper focus and stronger ties between industry and academic participants.

At the core of that effort lay four technical themes underlying much of the meeting’s program: automotive; nanophotonics/plasmonics; optics in computing; and virtual reality/augmented vision. The themes, noted Cundiff, all highlight the



Visionary Speaker
Evelyn Hu.

Visionary Speakers

A new feature of FiO+LS this year were nine “Visionary Speakers.” The 2017 lineup:

Majed Chergui (*EPFL*) looked at how new methods in the ultrafast X-ray to deep-UV regime are opening opportunities in basic science.

Jungsang Kim (*Duke University*) asked “What will lead us to a practical quantum computer?”—and found potential answers in techniques using trapped atomic ions.

Scott McEldowney (*Oculus Research*) sketched out the challenging path from the current, separate technologies of VR and AR to a future “mixed reality” combining both.

Evelyn Hu (*Harvard University*) described nanophotonic materials and components that can create networks and systems that function as seamless “fabrics” of light.

Wilhelm Kaenders (*TOPTICA Photonics*) explored the business and political issues emerging as quantum technology drives toward real applications.

James Thompson (*Univ. of Colorado/JILA*) discussed using atom ensembles’ quantum nature to move to the next stage of precision metrology.

Michael Godwin (*OSRAM*) envisioned the future of digital lighting for automotive applications.

Vladimir Shalaev (*Purdue University*) covered plasmonic, metamaterial and metasurface concepts for developing thermophotovoltaics, photodetectors and other applications.

Marc Taubenblatt (*IBM Research*) talked about new optical frameworks and solutions for handling the vast data flows of the future.



Awards Banquet

The OSA Board and conference attendees celebrated achievements of colleagues during the inaugural FiO+LS Awards Banquet. It honored OSA 2017 Fellows and a range of others. Among the honorees:

Margaret Murnane (above), University of Colorado at Boulder, USA, received the Frederic Ives Medal/Jarus W. Quinn Prize—OSA’s highest award, honoring overall distinction in optics.



The **Guide Star Alliance**, including TOPTICA Photonics and MPBC Communications (MPBC), won the Paul F. Forman Team Engineering Excellence Award, for team technical achievements in optical engineering. (Above: Wallace Clements, Daoping Wei and Wilhelm Kaenders.)



Ming C. Wu (above, with Eric Mazur), University of California, Berkeley, USA, received the C.E.K. Mees Medal, which recognizes an original use of optics across different fields.

A complete list of OSA Fellows and award winners and citations, including others recognized at FiO+LS, is at www.osa.org/awards.

future-focused, cross-cutting nature of optics and photonics technology. “FiO has been a very broad meeting, covering all areas of optics—and in some ways, that meant covering none,” he said. “The vision was to build these themes across disciplines, and bring people together to talk about them who might otherwise be ‘stovepiped’ in their different areas.”

Volker Sorger of George Washington University, USA, who serves as the chair of OSA Technical Group Development, saw evidence of the new focus in the networking activities of the groups, a long-standing FiO feature. “What I think [the groups] did well this year,” he said, “was trying to mingle academia and industry.” The agenda for the groups was a full one, with 12 groups involved in nine events, which drew some 400 people.

New speaker series

The cross-cutting meeting themes also featured in a new “Visionary Speakers” keynote series—colloquium-style talks by leaders from the optics and photonics community and beyond. And the talks’ focus was definitely on the future.

“The specific charge we gave the Visionary Speakers was to try to present a vision of where their field was going in the next five to ten years,” said Cundiff. “The speakers definitely said they were kind of scared by that—putting themselves on record about what the future was going to be like.” But the results, he said, were one of the meeting’s high points.

FiO+LS 2017 also included a joint plenary session on the meeting’s

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third day, featuring two high-profile speakers. One, Laura Cadonati of the Georgia Institute of Technology, USA, looked at the findings thus far from the Advanced LIGO gravitational-wave observatory, the recent addition of the European Virgo facility, and the advances in astronomy that will come about through “third-generation” efforts such as the proposed “Einstein Telescope” facility in Europe.

In the other plenary talk, Jason Eichenholz, the co-founder and CTO of Luminar Technologies, USA, took the audience on a highly visual tour of the lidar technologies that his firm is assembling to create an era of truly autonomous vehicles. After the plenary session, Eichenholz participated in a spirited panel discussion on the promise of, and some significant challenges for, cutting-edge automotive technology—in keeping with one of the meeting’s four technical themes.

Advocacy and diversity

The location in the U.S. capital afforded some unique opportunities in an era of political uncertainty. A standing-room-only talk by Rush Holt, a physicist and former U.S. congressperson who is now the CEO of the American Association for the Advancement of Science, carried a surprising message—that, in their efforts to communicate science to policymakers and the public, scientists are “too hung up on facts.” Instead, Holt suggested, we should focus more on science’s value as a process—and as “the best way of avoiding being deceived.”

The Washington location also allowed attendees to schedule Capitol



For photo info, visit www.osa-opn.org/fio2017.

Hill visits to put Holt's words into action, through OSA's Public Policy group. And an "Evening with the Agencies" session offered the chance to network directly with representatives of funding agencies from both the United States and the European Union.

Another notable event, which took place at OSA Headquarters, a few blocks away from the conference hotel, centered on building a more diverse community. This was the second "Global Women of Light" symposium, co-sponsored by Women in Science, Technology, Engineering and Entrepreneurship and the OSA Foundation. The event gathered more than 100 participants to discuss strategies for improving women's presence in science leadership positions—and to demonstrate, in the words of

participant Ursula Keller, that "the only men that have to fear intelligent women are the mediocre men."

Annual meeting 2.0

Even amid all of the new features, FIO 2017 was still recognizably OSA's annual meeting. Indeed, the first day of the meeting featured a ceremony renaming the society's headquarters building to honor Jarus Quinn, who served for 25 years as OSA's first executive director. The meeting also hosted a high-energy conference reception, student events including an OSA student member party and Student Leadership Conference, and the inaugural joint awards banquet of OSA and the APS Laser Science division.

In sizing up attendance, Steve Cundiff noted that, in addition to

a strong student presence, there appeared to be more registrations from industry than has previously been the case for FIO+LS. And he suggested that the community that attends the meeting could evolve further toward an industrial-academic mix as word spreads about the meeting's new format.

Susana Marcos agreed, noting that the new programming had things to offer both first-time FIO+LS visitors and those who had been coming for years. The interdisciplinary themes and opportunities for industry-academia connections, she said, made it a great place for "cross-pollination opportunities across fields." **OPN**

For more FIO+LS meeting stories, visit www.osa-opn.org/fio2017.