

Final Report for ONR project ‘US/Middle East Conference on Photonics’

ONR grant No. N00014-20-1-2032

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The ONR grant No. N00014-20-1-2032 has been used to support the US/Middle East Conference on Photonics, in particular to support the participation of early-career scientists and foreign scientists from the Middle East. The period of performance spanned across the time period from November 1, 2019 to October 31, 2021. In the following, we describe the main achievements enabled by this grant and the success of this conference in bringing together scientists from different countries and backgrounds to discuss science.

Conference Locations:

- **Advance Science Research Center of CUNY, 85 St. Nicholas Terrace, New York, NY 10031**
- **The Graduate Center, CUNY, 365 5th Ave., New York, NY 10016**

Meeting/Conference Web Site:

<https://asrc.gc.cuny.edu/photonics/events/u-s-middle-east-conference-on-photonics/>

Overview of Conference:

The conference was held over three days from November 4-6, 2019. The program featured 40 invited 25-minute talks and poster sessions with approximately 10 groups participating at the ASRC. On the first evening of the conference, there was an early career symposium on photonics with 20, 15-minute talks organized by graduate students and postdocs, a panel entitled, “Photonics 3.0: A Worldwide Quest for the Next Technology Revolution,” held at The Graduate Center of the City University of New York.

We had 150 attendees, and approximately 40 of the participants were students.

REPORT DOCUMENTATION PAGE

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Andrea Alu

19b. PHONE NUMBER (Include area code)

212-413-3260

INSTRUCTIONS FOR COMPLETING SF 298**1. REPORT DATE.**

Full publication date, including day, month, if available. Must cite at least the year and be Year 2000 compliant, e.g. 30-06-1998; xx-06-1998; xx-xx-1998.

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State the type of report, such as final, technical, interim, memorandum, master's thesis, progress, quarterly, research, special, group study, etc.

3. DATES COVERED.

Indicate the time during which the work was performed and the report was written.

4. TITLE.

Enter title and subtitle with volume number and part number, if applicable. On classified documents, enter the title classification in parentheses.

5a. CONTRACT NUMBER.

Enter all contract numbers as they appear in the report, e.g. F33615-86-C-5169.

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Enter all unique alphanumeric report numbers assigned by the performing organization, e.g. BRL-1234; AFWL-TR-85-4017-Vol-21-PT-2.

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The conference main objective has been to strengthen engagement between U.S., European, and Middle Eastern scientists by providing a forum for discussion of cutting-edge photonics research. As stated from one of the invited speakers: “It is indeed inspiring to use the power of science and scientific curiosity to bring people together irrespective of their background, gender or race.”
 – Hatice Altug, École Polytechnique Fédérale de Lausanne (EPFL).

November 4-6, 2019

**US/Middle East
CONFERENCE ON PHOTONICS**

The conference seeks to strengthen engagement between US, European, and Middle Eastern scientists by providing a forum for discussion of cutting edge photonics research

TOPICS INCLUDE:

Metamaterials Integrated Photonics	Topological Insulators Quantum Optics	Plasmonics Microwave Photonics	Nanooptics Sensing
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INVITED SPEAKERS:

Esen Alp, <i>Argonne NL, SESAME</i>	Francisco J. Garcia-Vidal, <i>UAM</i>	Patrick Sebbah, <i>Bar-Ilan, CNRS</i>
Stephen Arnold, <i>NYU</i>	Yakir Hadad, <i>Tel Aviv University</i>	Mordechai Segev, <i>Technion</i>
Mete Atatüre, <i>Cambridge</i>	F. Ömer Ilday, <i>Bilkent University</i>	Vladimir Shalaev, <i>Purdue</i>
Dmitry Basov, <i>Columbia</i>	Ori Katz, <i>Hebrew University</i>	Gennady Shvets, <i>Cornell</i>
Carl Bender, <i>Washington University</i>	Mercedeh Khajavikhan, <i>CREOL</i>	Ben Steinberg, <i>Tel Aviv University</i>
Alexandra Boltasseva, <i>Purdue</i>	Jacob Khurgin, <i>Johns Hopkins</i>	A. Douglas Stone, <i>Yale</i>
Igal Brener, <i>Sandia National Lab</i>	Tsampikos Kottos, <i>Wesleyan</i>	Giuseppe Strangi, <i>Case Western</i>
Yaron Bromberg, <i>Hebrew University</i>	Alireza Marandi, <i>Cal Tech</i>	Hakan Türeci, <i>Princeton</i>
Federico Capasso, <i>Harvard</i>	Ziad Muslimani, <i>Florida State</i>	Ewold Verhagen, <i>AMOLF</i>
Demetrios Christodoulides, <i>CREOL</i>	Evgenii Narimanov, <i>Purdue</i>	Michael Weinstein, <i>Columbia</i>
Ertugrul Cubukcu, <i>UC San Diego</i>	Ekmel Özbay, <i>Bilkent University</i>	Ying Wu, <i>KAUST</i>
Nader Engheta, <i>Penn</i>	Sahin Özdemir, <i>Penn State</i>	Arthur Yaghjian, <i>Consultant</i>
Andrea Frattalocchi, <i>KAUST</i>	Mikael Rechtsman, <i>Penn State</i>	Amnon Yariv, <i>Cal Tech</i>
Alex Gaeta, <i>Columbia</i>	Bahaa Saleh, <i>CREOL</i>	Hasan Yilmaz, <i>Yale</i>

ORGANIZING COMMITTEE:

Andrea Alù, <i>CUNY</i>	Ekmel Özbay, <i>Bilkent</i>
Nader Engheta, <i>Penn</i>	Mordechai Segev, <i>Technion</i>
Azriel Genack, <i>CUNY</i>	Matthew Sfeir, <i>CUNY</i>
Vinod Menon, <i>CUNY</i>	

PLEASE JOIN US! For more information:
<https://asrc.gc.cuny.edu/usme-photonics>

Call for abstracts for Early Career Symposium

ADVANCED SCIENCE RESEARCH CENTER THE GRADUATE CENTER CITY UNIVERSITY OF NEW YORK

APS physics American Physical Society

AIP American Institute of Physics

OSA The Optical Society

THE GRADUATE CENTER CITY UNIVERSITY OF NEW YORK

ASRC: 85 St. Nicholas Terrace, New York, NY 10031

Conference flier of the conference

Organizing Committee: Andrea Alù, CUNY; Nader Engheta, Penn; Azriel Genack, CUNY; Vinod Menon, CUNY; Ekmel Özbay, Bilkent; Mordechai Segev, Technion; Matthew Sfeir, CUNY.

Conference Aim: The aim of the conference was to strengthen the foundational principles of scientific inquiry of unfettered discourse across borders without regard to nationality, religion, or politics. The focus was on interactions with countries in the Middle East and on highlighting the important contributions made to photonics by scientists from the Middle East. This was accomplished by providing a forum to US, European, and Middle Eastern scientists for discussion of cutting-edge photonics research. Because the principle of open engagement is so precious to the photonics community, the conference was attended by international leaders in photonics. Many speakers opened their remarks with an appreciation for the chance to be counted for open engagement.

Spirit of the Conference and Scientific Program: There was palpable excitement among the participants in the conference. First would be that so many trailblazers in photonics are also many scientists just starting their careers. In addition, the conference was a celebration of the new photonics initiative at the ASRC. But fundamentally, the conference is an opportunity to recognize the importance of the Middle East as a source of leading researchers in photonics in the US and around the world. The conference was an opportunity to express our debt to them and to support scientists from this region. At the same time, it is a chance to support scientific engagement between the US and Europe and the Middle East, and between the nations of the Middle East. The conference is an affirmation of the basic tenets that underpin the scientific enterprise - unfettered engagement with the physical world and with colleagues around the world; a culture in which the truth matters, and statements must be verified, without reliance on preconceived notions. Indeed, one's most rewarding day in science is the day one discovers that what one has always accepted as true, and even fundamental, needs to be reinterpreted, leading to a broader perspective.

Panel Discussion: The conference featured a panel discussion:

Photonics 3.0: A Worldwide Quest for the Next Technology Revolution held at The Graduate Center of CUNY.

The panel took a hard look at the challenge of open engagement in the Middle East and proposed ways to move forward. The panel was moderated by Andrea Alù of the Advanced Science Research Center (ASRC); The Graduate Center, CUNY. Panelists were Esen Ercan Alp, Argon National Laboratory, Chair, Synchrotron-light for Experimental Science and Applications in the Middle East (SESAME) Scientific Advisory Committee, Federico Capasso, Harvard University Nader Engheta, University of Pennsylvania, and Mordechai Segev, Technion – Israel Institute of Technology

Advanced Science Research Center: The conference was organized by the Advanced Science Research Center and by the Physics Program of the Graduate Center of CUNY.

The conference was the first large conference at the Photonics Initiative at the Advanced Science Research Center and was an opportunity for people in the photonics to become acquainted with the ASRC.

Expenditures of funds supplied by the Office of Naval Research:

The total record of expenditures on this grant was for \$14,381.28, generously supported by ONR. This grant was used to pay \$100 registration fees for 16 graduate students, for travel to the conference of six invited speakers, including one panelist, of subway fare from the ASRC to The Graduate Center of CUNY to attend the panel discussion entitled “Photonics 3.0: A Worldwide Quest for the Next Technology Revolution,” and a set of contributed talks by student and postdocs.

Conference Sponsors:

The Office of Naval Research
The Photonics Initiative of the Advanced Science Research Center of CUNY
The Graduate Center of CUNY
The American Physical Society
The Optical Society of America
The American Institute of Physics (Applied Physics Letters, AVS Vacuum Science)
Nature Photonics Group
Air Force Office of Scientific Research
The Photonics Initiative of the Advanced Science Research Center of CUNY
The Graduate Center of CUNY
Teledyne Princeton Instruments
NeaSpec
Hitachi High-Tech
Nature Photonics Group
Wiley Publishing

Exhibitors:

The American Institute of Physics (Applied Physics Letters, AVS Vacuum Science)
Teledyne Princeton Instruments
NeaSpec
Hitachi High-Tech

The conference program can be found at the link: [Conference Program.](#)

The program of our panel and early career symposium can be found at the links: [Reception, Panel & Early-Career Scientist Symposium.](#)

We awarded 3 student awards, as follows:

Best Poster Award, sponsored by American Physical Society

Dorri Halbertal, Columbia University

Nano-optical studies of Moiré super-lattice domains in twisted graphene heterostructures

Early-Career Symposium Best Talk Award, sponsored by Nature Photonics, NPG
Zoé-Lise Deck-Léger, Polytechnique Montréal
Scattering at Interluminal Interface

Early-Career Symposium Best Talk Award, sponsored by Wiley
Alexander Cerjan, The Pennsylvania State University
Experimental Realization of a Weyl Exceptional Ring

Presentation Data:

- Invited Presentations: 40
- Contributed oral Presentations: 20
- Poster Presentations: 10
- Panel Discussion, 1 moderator and 4 panelists.



Andrea Alù speaking at the opening session of the US/Middle East Conference on Photonics on November 4, 2021



Evening panel discussion of the US/Middle East Conference on Photonics on November 4, 2019. Panelists from left to right: Federico Capasso, Harvard University, Mordechai Segev, Technion – Israel Institute of Technology, University Nader Engheta, University of Pennsylvania, and Esen Ercan Alp, Argon National Laboratory, Chair, Synchrotron-light for Experimental Science and Applications in the Middle East (SESAME) Scientific Advisory Committee. Panel moderator, Andrea Alù of the ASRC and CUNY Graduate Center, not shown.



Conference sessions
(above) and discussions
(left).