Francesco Monticone

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Summary of Research Interests and Accomplishments

My current research interests are in the areas of *applied electromagnetics, metamaterials, plasmonics, nanotechnology, and nanophotonics*, spanning a broad range of topics including *extreme scattering engineering, cloaking and invisibility, nanoparticles, nanocircuits, nanoantennas, parity-time symmetry, active devices and advanced metasurfaces*, with particular emphasis on cross-disciplinary research that takes inspiration from different scientific domains. In this context, I have extensively worked on translating and exploiting well-established methods and concepts from microwave/antenna engineering and circuit theory to the realm of optics, photonics and nanotechnology.

I have authored and co-authored more than 70 scientific contributions published or under review in peer-reviewed journal papers, book chapters and peer-reviewed conference proceedings, receiving more than 600 citations in the past three years. In particular, my first-author papers have appeared in several high-impact journals, including Physical Review Letters (three times selected as "Editor's Suggestion"), Nature Nanotechnology, Proceedings of the IEEE, and Science. Some of my recent research work has been picked up by national and international media outlets, such as BBC, NBC News and Time Magazine.

Education

Sept 2011 - present

PhD program in Electrical and Computer Engineering.
Expected graduation date: Spring 2016.

The University of Texas at Austin, Austin, TX

- Advisor: Prof. Andrea Alù.
- Seven classes completed with a GPA of 3.98/4.0.
- PhD Proposal: *Scattering and Radiation Engineering Using Metamaterials, Metasurfaces and Plasmonics: from Invisibility, Resonant Scattering and Light Trapping, to All-Optical Signal Manipulation and Processing*, Nov. 2014.

2009 - 2011

Master of Science degree (*Laurea Specialistica* degree) in Electronics Engineering.

Politecnico di Torino, Torino, Italy

- Summa cum laude and honors (110/110 e lode), 20 classes with a GPA of 29.7/30 (Italian academic grading system) and 9 lodi (additional honors points).
- Thesis in Applied Electromagnetics: *Theoretical analysis and design of a conformal electromagnetic cloak based on periodically-modulated microstrip lines on a flexible polymeric shell*. Part of the thesis work was carried out at the Faculty of Science of Macquarie University, Sydney, Australia (see section "Experience").
- Advisor: Prof. Mario Orefice, Co-advisor: Prof. Ladislau Matekovits.

2005 - 2009

Bachelor of Science degree (*Laurea* degree) in Electronics Engineering.

Politecnico di Torino, Torino, Italy

- Thesis in Applied Electromagnetics: *Design and analysis of width-modulated microstrip line based high impedance surfaces.*
- Advisor: Prof. Ladislau Matekovits.

Research Experience

Sept 2011 - present

Graduate Research Assistant

The University of Texas at Austin, Austin, TX
Metamaterials and Plasmonics Research Laboratory

- Advisor: Prof. Andrea Alù
- Research activity:
  - *Scattering engineering at the extreme with metamaterials and plasmonics*: plasmonic resonances, cloaking, superscattering, Fano resonances, electromagnetically induced transparency, directional scattering/emission/absorption, embedded photonic eigenstates.
  - *Fundamental physical bounds* on scattering processes, wave manipulation, and electromagnetic invisibility.
  - *Plasmonic and dielectric nanoparticles and nanostructures*: giant optical magnetism, metamaterial-inspired optical nanocircuitry (metatronics), optical nanocircuits and nanoantennas. Plasmonic nanoparticles for bio-chemical imaging/sensing and biomedical applications.
  - *Active, nonlinear, nonreciprocal, nonlocal, and multi-physics* metamaterial and metasurface devices.
  - *Advanced metasurfaces and patterned surfaces*: metasurfaces for wave manipulation, hyperbolic metasurfaces, computational metasurfaces, broadband mantle cloaking devices, mantle cloaks for non-invasive imaging and sensing.
  - *Parity-time symmetric metamaterials and metasurfaces*: loss-immune all-angle negative refraction and aberration-free imaging.
  - *RF antennas*: phased arrays, reflectarrays and transmitarrays, leaky-wave antennas. *Microwave circuits and components.*

Sept 2015 - present

Visiting Student Researcher

FOM Institute AMOLF, Amsterdam, The Netherlands
Resonant Nanophotonics Group

- Supervisors: Prof. Andrea Alù, Prof. Femius Koenderink.
- Research activity: Light trapping in the radiation continuum, cloaked sensors for near-field imaging techniques, interaction of metamaterials and metasurfaces with electron beams, cathodoluminescence, nano-optics and nanophotonics.

July 2010 - Oct 2010

Visiting Student Researcher

Macquarie University, Sydney, Australia
Centre for Electromagnetic and Antenna Engineering (CELANE)

- Funding: Travel Grant awarded by Politecnico di Torino (see Section "Awards").
- Supervisors: Prof. Mario Orefice, Prof. Ladislau Matekovits and Prof. Karu Esselle.
- Research activity: Electromagnetic band-gap materials. Broadband cloaking devices working in the microwave/millimeter-wave range.

2009 - 2011 **Research Assistant**

Politecnico di Torino, Torino, Italy
Applied Electromagnetics Group

- Supervisors: Prof. Mario Orefice, Prof. Ladislau Matekovits.
- Research activity: Electromagnetic band-gap materials and high-impedance metasurfaces.

Teaching Experience

2014 - present **Occasional Lecturer** - EE325: "Electromagnetic Engineering"

The University of Texas at Austin, Austin, TX
Department of Electrical and Computer Engineering

Lectures on vector calculus, electrostatics, magnetostatics, and electromagnetic theory. Problem solving sessions.

Sep 2011 - present Mentored and tutored undergraduate and graduate students on several research projects in the areas of plasmonics, metamaterials and nanophotonics.

The University of Texas at Austin, Austin, TX.
Metamaterials and Plasmonics Research Laboratory

Sep 2015 - present Tutored graduate students on research projects in the areas of plasmonics, metamaterials and nanophotonics.

FOM Institute AMOLF, Amsterdam, The Netherlands.
Resonant Nanophotonics Group.

Spring 2013 **Teaching Assistant** - EE 383P-6: "Optoelectronic Devices"

The University of Texas at Austin, Austin, TX
Department of Electrical and Computer Engineering

Tutored students on specific subjects of solid-state physics, optics and electronics. Office hour assistance to students. Organized additional one-to-one sessions for students in need of further assistance. Graded homework, student presentations and exams.

Spring 2009 **Teaching Assistant** - "Complements of Electromagnetic Fields"

Politecnico di Torino, Torino, Italy
Department of Electronics and Telecommunications

Tutored undergraduate students in basic electromagnetic theory and numerical simulation software.

Aug 2005 - July 2011 Private tutoring for high school and undergraduate students in mathematics, physics and applied electronics (analog and digital).

Francesco Monticone

Professional Service

Active peer reviewer

for the journals *Physical Review Applied*, *Physical Review B*, *ACS Photonics*, *Optics Express*, *Optics Letters*, *Scientific Reports*, *Journal of Applied Physics*, *IEEE Antennas and Wireless Propagation Letters*, *IEEE Transactions on Antennas and Propagation* and several international conferences.

Sponsor and Exhibitor Organizer

for the international conferences Metamaterials'2015, Oxford, UK, September 7-10, 2015, and Metamaterials'2016, Chania, Crete, Greece, 17-22 September 2016. In 2015, I raised the highest amount of sponsor money of this conference series so far.

Professional Memberships

- Institute of Electrical and Electronics Engineers (**IEEE**).
  Graduate student member (2009 - present).
- IEEE Antennas and Propagation Society (**IEEE AP-S**). Student member (2012 - present).
- American Physical Society (**APS**). Student member (2011 - present).
- American Association for the Advancement of Science (**AAAS**).
  Student member (2012 - present).
- Optical Society of America (**OSA**). Student member (2013 - present).
- IEEE Photonics Society (**IEEE IPS**). Student member (2013 - present).
- Virtual Institute for Artificial Electromagnetic Materials and Metamaterials.
  Student member (2015 - present).

Scientific Honors, Awards and Recognitions

2015 **IEEE Photonics Society Graduate Student Fellowship**
"The IEEE Photonics Society established the Graduate Student Fellowship Program to provide Graduate Fellowships to outstanding Society student members pursuing graduate education within the Society field of interest (electro-optics, lasers, photonics, optics, or closely related fields)". The Society awards up to ten Fellowships each year worldwide, based on research excellence and contributions to the Society's publications and conferences.

2015 **FGSA Travel Award for Excellence in Graduate Research**
Awarded by the American Physical Society, to support the participation to the 9th International Congress on Advanced Electromagnetic Materials in Microwaves and Optics - Metamaterials 2015, Oxford, UK, September 7-10, 2015. "The FGSA Travel Award recognizes graduate students who have made noteworthy progress in their academic careers. This includes both graduate students who demonstrate great potential as well as those with considerable accomplishments in their field".

2015 **Honorable Mention**
Student Paper Competition of the 2015 IEEE International Symposium on Antennas and Propagation and North American Radio Science Meeting, Vancouver, Canada, July 19-25, 2015, with the paper: F. Monticone, C. Valagiannopoulos, and A. Alù, "Aberration-Free Planar Focusing based on Parity-Time Symmetric Nonlocal Metamaterials".

2015 **USNC-URSI Travel Fellowship Grant Award 2015**
"For technical merit", to support the participation to the 2015 North American Radio Science Meeting in Vancouver, Canada, July 19-25, 2015.

2014 **H.L. Bruce Endowed Graduate Student Fellowship**
One of the most prestigious fellowships awarded by the Graduate School of The University of Texas at Austin.

2013 **Physical Review Letters "Editors' choice"**
For the paper F. Monticone, and A. Alù, "Embedded Photonic Eigenvalues in 3D Nanostructures".

2014 **Honorable Mention**
Student Paper Competition of the 2014 IEEE AP-S International Symposium on Antennas and Propagation, Memphis, Tennessee, USA, July 6-11, 2014, with the paper: F. Monticone, V. Galdi, N. Engheta, and A. Alù, " 'Computing Metasurfaces' to Perform Mathematical Operations".

2013 **IEEE Antennas and Propagation Society Doctoral Research Award**
Awarded by the IEEE Antennas and Propagation Society (AP-S) for my project proposal entitled "Molding the Scattering Response with Metamaterials and Plasmonics".

2013 **Best Student Paper Award (1st prize)**
Metamaterials 2013 Student Paper Competition, with the paper: F. Monticone and A. Alù, "On the Physical Bounds of Cloaking and Invisibility".

2013 **Incubic/Milton Chang Travel Award**
Awarded by the Optical Society of America (OSA).

2013 **Full Membership**
Scientific Honor Society Sigma Xi.

2013 **Honorable Mention**
Student Paper Competition of the 2013 IEEE AP-S International Symposium on Antennas and Propagation, Orlando, Florida, USA, July 7-12, 2013, with the paper: F. Monticone, Xiaoqin Li, and A. Alù, "Strong Optical Magnetism and Fano Resonances in Asymmetric Plasmonic Metamolecules".

2013 **Physical Review Letters "Editors' choice"**
For the paper F. Monticone, N. Mohammadi Estakhri, and A. Alù, "Full Control of Nanoscale Optical Transmission with a Composite Metascreen".

2013 **Physical Review Letters "Editors' choice"**
For the paper F. Monticone, C. Argyropoulos, and A. Alù, "Multi-Layered Plasmonic Covers for Comblike Scattering Response and Optical Tagging".

2013 **USNC-URSI Travel Fellowship Grant Award 2013**
"For technical merit", to support the participation to the 2013 USNC-URSI National Radio Science Meeting in Boulder, CO, USA.

2012 Selected to attend the "**2012 Gordon Research Conference (GRC) on Plasmonics**" and the associated "Gordon Research Seminar" (GRS). These selective and prestigious events bring together the best students and scientists working in the field of Plasmonics.

2010 Selected to attend the "**IBM EMEA Best Student Recognition Event**" in July 2010 at the IBM Research and Development Lab in Boeblingen, Germany. This annual event is organized by IBM for about 65 selected top students of engineering, mathematics and economics, from Europe, the Middle East and Africa.

2010 Recipient of a **Student Travel Grant** awarded by Politecnico di Torino to carry out the master's thesis project at Macquarie University in Sydney, Australia, with the project proposal "Wideband Cloaking Devices".

Scientific Contributions

Summary

- **28** papers, published or under review, in peer-reviewed international journals, including 1 Science, 1 Proceedings of the IEEE, 1 Nature Nanotechnology, 1 Nature Communications, 1 Physical Review X and 3 Physical Review Letters.
- **43** conference papers and talks.
- **2** book chapters.
- **Google Scholar Profile:** https://scholar.google.com/citations?user=IrARKxQAAAAJ&hl=en&oi=ao

Peer-Reviewed Journal Papers

[1] F. Monticone, and A. Alù, **"Invisibility Exposed: Physical Bounds on Passive Cloaking,"** under review.

[2] F. Monticone*, C. Valagiannopoulos*, and A. Alù, **"Aberration-Free Imaging Based on Parity-Time Symmetric Nonlocal Metasurfaces,"** under review. * Joint first authorship.

[3] F. Monticone, and A. Alù, **"Metamaterial and Plasmonic Devices,"** Reports on Progress in Physics, under review, (*invited review paper*).

[4] F. Qin*, L. Ding*, L. Zhang*, F. Monticone*, C. C. Chum, J. Deng, S. Mei, Y. Li, J. Teng, M. Hong, S. Zhang, A. Alù, and C. W. Qiu, **"Hybrid bilayer plasmonic metasurface efficiently manipulates visible light,"** Science Advances, in press, 2015. * Joint first authorship.

[5] C. Valagiannopoulos,* F. Monticone,* and A. Alù, **"PT-Symmetric Planar Devices for Field Transformation and Imaging,"** Journal of Optics, in press, 2015, (*invited paper*). * Joint first authorship.

[6] R. Fleury*, F. Monticone*, and A. Alù, **"Invisibility and Cloaking: Origins, Present, and Future Perspectives,,"** Physical Review Applied, Vol. 4, No. 3, 037001 (20 pages), September 1, 2015, (*invited review paper*). * Joint first authorship.
doi: 10.1103/PhysRevApplied.4.037001

[7] B. Hopkins, D. S. Filonov, A. E. Miroshnichenko, F. Monticone, A. Alù, and Y. S. Kivshar, **"Interplay of magnetic responses in all-dielectric oligomers and magnetic Fano resonances,"** ACS Photonics, Vol. 2, No. 6, pp. 724-729, June 1, 2015.
doi: 10.1021/acsphotonics.5b00082

[8] F. Monticone, and A. Alù, **"Leaky-Wave Theory, Techniques and Applications: From Microwaves to Visible Frequencies,"** Proceedings of the IEEE, Vol. 103, No. 5, pp. 793-821, May 26, 2015, (*invited paper*). [The paper has been featured on the cover. A prolog by J. Esch, introducing our paper, has also appeared on the same issue]
doi: 10.1109/JPROC.2015.2399419

[9] X. Ding*, F. Monticone*, K. Zhang, L. Zhang, D. Gao, S. N. Burokur, A. de Lustrac, Q. Wu, C. W. Qiu, and A. Alù, **"Ultrathin Pancharatnam-Berry Metasurface with Maximal Cross-Polarization Efficiency,"** Advanced Materials, Vol. 27, No. 7, pp. 1195-1200, February 18, 2015. * Joint first authorship.
doi: 10.1002/adma.201405047

[10] A. Silva, F. Monticone, G. Castaldi, V. Galdi, A. Alù, and N. Engheta, **"Doing Math with Light,"** Optics and Photonics News, Year in Optics 2014, Vol. 25, No. 12, p. 52, December 1, 2014.
available at: Optics and Photonics News

[11] F. Monticone, and A. Alù, **"Trapping Light in Plain Sight: Embedded Eigenstates in Open 3D Nanostructures,"** Forum for Electromagnetic Research Methods and Application Technologies (FERMAT), Vol. 6, No. 1, November 3, 2014.
available at: FERMAT - News and Views

[12] F. Monticone, and A. Alù, **"The Quest for Optical Magnetism: From Split-Ring Resonators to Plasmonic Nanoparticles and Nanoclusters,"** Journal of Materials Chemistry C, Vol. 2, No. 43, pp. 9059-9072, October 16, 2014, (*invited feature article*).
doi: 10.1039/C4TC01406E

[13] F. Monticone, and A. Alù, **"Physical Bounds on Electromagnetic Invisibility and the Potential of Superconducting Cloaks,"** Photonics and Nanostructures - Fundamentals and Applications, Special Issue for Metamaterials 2013, Vol. 12, No. 4, 330-339, August 2014, (*invited paper*).
doi: 10.1016/j.photonics.2014.05.008

[14] F. Monticone, and A. Alù, **"Embedded Photonic Eigenvalues in 3D Nanostructures,"** Physical Review Letters, Vol. 112, No. 21, 213903 (5 pages), May 29, 2014. [This paper has been selected as PRL Editor's Suggestion]
doi: 10.1103/PhysRevLett.112.213903.

[15] J. Shi*, F. Monticone*, S. Elias*, Y. Wu, D. Ratchford, X. Li, and A. Alù, **"Modular Assembly of Optical Nanocircuits,"** Nature Communications, Vol. 5, No. 3896, May 29, 2014. * Joint first authorship.
doi: 10.1038/ncomms4896.

[16] C. Argyropoulos, F. Monticone, N. Mohammadi Estakhri, and A. Alù, **"Tunable Plasmonic and Hyperbolic Metamaterials,"** International Journal of Antennas and Propagation, Special Issue on 'Reconfigurable Electromagnetics through Metamaterials', Vol. 2014, 532634 (11 pages), April 6, 2014, (*invited paper*).
doi: 10.1155/2014/532634.

[17] F. Monticone, and A. Alù, **"Metamaterials and Plasmonics: From Nanoparticles to Nanoantenna Arrays, Metasurfaces and Metamaterials,"** Chinese Physics B, Vol. 23, No. 4, 047809 (12 pages), March 20, 2014, (*invited review paper*). [This paper was the most downloaded Chinese Physics B paper in 2014]
doi: 10.1088/1674-1056/23/4/047809.

[18] A. Silva*, F. Monticone*, G. Castaldi, V. Galdi, A. Alù, and N. Engheta, **"Performing Mathematical Operations with Metamaterials,"** Science, Vol. 343. No. 6167, pp. 160-163, January 10, 2014. [A Perspective from A. Sihvola has appeared on the same issue, pp. 144-145; News highlights have appeared on Phys.org, Nanowerk, AzoNano, Laser Focus World, Tech Times, The Alcalde, La Repubblica, New Scientist, Live Science, ANSA, Penn Current, UT News, among others] * Joint first authorship.
doi: 10.1126/science.1242818

[19] F. Monticone, and A. Alù, **"Metamaterial-Enhanced Nanophotonics,"** Optics and Photonics News, Year in Optics 2013, Vol. 24, No. 12, p. 35, November 26, 2013.
doi: 10.1364/OPN.24.12.000035.

[20] F. Monticone, and A. Alù, **"Do Cloaked Objects Really Scatter Less?,"** Physical Review X, Special Issue on Metamaterials, Vol. 3, No. 4, 041005 (10 pages), October 21, 2013, (*invited paper*). [Press coverage by BBC, NBC News, Physics World, Live Science, Gizmag, Mashable, The Horn, The Alcalde, Bio News Texas, National Journal, Time Magazine, among others]
doi: 10.1103/PhysRevX.3.041005

[21] C. Argyropoulos, F. Monticone, G. D'Aguanno, and A. Alù, **"Plasmonic Nanoparticles and Metasurfaces to Realize Fano Spectra at Ultraviolet Wavelengths,"** Applied Physics Letters, Vol. 103, No. 14, 143113 (4 pages), October 1, 2013.
doi: 10.1063/1.4823575.

[22] C. Argyropoulos, N. Mohammadi Estakhri, F. Monticone, and A. Alù, **"Negative Refraction, Gain and Nonlinear Effects in Hyperbolic Metamaterials,"** Optics Express, Focus Issue on Hyperbolic Metamaterials: Fundamentals and Applications, Vol. 21, No. 12, pp. 15037-15047, June 17, 2013, (*invited paper*).
doi: 10.1364/OE.21.015037.

[23] F. Monticone, N. Mohammadi Estakhri, and A. Alù, **"Full Control of Nanoscale Optical Transmission with a Composite Metascreen,"** Physical Review Letters, Vol. 110, No. 20, 203903 (5 pages), May 14, 2013. [This paper has been selected as PRL Editor's suggestion; Press coverage by Phys.org].
doi: 10.1103/PhysRevLett.110.203903.

[24] F. Monticone, C. Argyropoulos, and A. Alù, **"Multi-Layered Plasmonic Covers for Comblike Scattering Response and Optical Tagging,"** Physical Review Letters, Vol. 110, No. 11, 113901 (5 pages), March 12, 2013. [This paper has been selected as PRL Editor's suggestion].
doi: 10.1103/PhysRevLett.110.113901.

[25] F. Shafiei*, F. Monticone*, K. Q. Le, X. X. Liu, T. Hartsfield, A. Alù, and X. Li, **"A Subwavelength Plasmonic Metamolecule Exhibiting Magnetic-Based Optical Fano Resonance,"** Nature Nanotechnology, Vol. 8, pp. 95-99, January 27, 2013. [The paper has been featured on the cover. A News and Views by P. Nordlander highlighting our findings has also appeared in the same issue]. * Joint first authorship.
doi: 10.1038/nnano.2012.249.

[26] F. Monticone, C. Argyropoulos, and A. Alù, **"Layered Plasmonic Cloaks to Tailor the Optical Scattering at the Nanoscale,"** Scientific Reports, Special Issue for E-MRS 2012, Vol. 2, No. 912, December 3, 2012, (*invited paper*).
doi: 10.1038/srep00912.

[27] C. Argyropoulos, P. Y. Chen, F. Monticone, G. D'Aguanno, and A. Alù, **"Nonlinear Plasmonic Cloaks to Realize Giant All-Optical Scattering Switching,"** Physical Review Letters, Vol. 108, No. 26, 263905 (5 pages), June 27, 2012.
doi: 10.1103/PhysRevLett.108.263905.

[28] P. Y. Chen, F. Monticone, and A. Alù, **"Suppressing the Electromagnetic Scattering with an Helical Mantle Cloak,"** IEEE Antennas and Wireless Propagation Letters, Special Cluster on Metamaterials, Vol. 10, pp. 1598-1601, December 9, 2011, (*invited paper*).
doi: 10.1109/LAWP.2011.2179001.

Book Chapters

[1] F. Monticone,and A. Alù, **"Scattering at the Extreme with Metamaterials and Plasmonics,"** in A Handbook of Metamaterials and Nanophotonics, S. Maier, K. Shamonina, S. Guenneau, O. Hess, J. Aizpurua, eds., World Scientific, in press.

[2] P. Y. Chen, F. Monticone, C. Argyropoulos, and A. Alù, **"Plasmonic Optical Nanoantennas,"** in Modern Plasmonics, A. Maradudin, J. R. Sambles, W. L. Barnes, eds., Elsevier, Ch. 4, pp. 109-136, 2014.

Invited Talks and Seminars

[1] F. Monticone, and A. Alù, **"Extraordinary Light Trapping in Plasmonic and Metamaterial Structures,"** SPIE Photonics Europe, Brussels, Belgium, April 4, 2016.

[2] F. Monticone, **"On Passive and Active Metasurfaces,"** Nanophotonics Colloquium, FOM Institute AMOLF, Amsterdam, The Netherlands, December 6, 2015.

[3] F. Monticone, and A. Alù, **"Realization and Operation of Modular 3-D Optical Nanocircuits,"** 2015 IEEE International Symposium on Antennas and Propagation and North American Radio Science Meeting, Vancouver, Canada, July 19-25, 2015.

[4] F. Monticone, **"Cloaking devices,"** Faculty of Science, Macquarie University, Sydney, Australia, October 8, 2010.

Conference Papers and Talks

[1] F. Monticone, and A. Alù, **"Trapping Light in Plain Sight,"** Nanoscale Quantum Optics 2015, Amsterdam, The Netherlands, October 23, 2015.

[2] F. Monticone, and A. Alù, **"Leaky Waves, Wood's Anomalies and Extraordinary Optical Trapping,"** 9th International Congress on Advanced Electromagnetic Materials in Microwaves and Optics - Metamaterials 2015, Oxford, UK, September 7-10, 2015.

[3] F. Monticone, C. Valagiannopoulos, S. Savoia, R. Fleury and A. Alù, **"PT-Symmetric Metamaterial Systems for Aberration-Free Imaging and Wave Manipulation,"** 9th International Congress on Advanced Electromagnetic Materials in Microwaves and Optics - Metamaterials 2015, Oxford, UK, September 7-10, 2015.

[4] F. Monticone, and A. Alù, **"Embedded Photonic Eigenstates: Towards Ideal Light Localization and Confinement in Open Nanostructures,"** OSI 2015 - The International Conference on Optics of Surfaces and Interfaces, Austin, Texas, USA, June 28 - July 3, 2015.

[5] F. Monticone, N. Mohammadi Estakhri, and A. Alù, **"Linear and Nonlinear Optical Nano-Antennas,"** 2015 IEEE International Symposium on Antennas and Propagation and North American Radio Science Meeting, Vancouver, Canada, July 19-25, 2015, (*invited talk*).

[6] F. Monticone, C. Argyropoulos, and A. Alù, **"MIMO Optical Wireless at the Nanoscale,"** 2015 IEEE International Symposium on Antennas and Propagation and North American Radio Science Meeting, Vancouver, Canada, July 19-25, 2015.

[7] F. Monticone, and A. Alù, **"Embedded Scattering Eigenstates: Light Trapping in 2D and 3D Systems,"** 2015 IEEE International Symposium on Antennas and Propagation and North American Radio Science Meeting, Vancouver, Canada, July 19-25, 2015.

[8] F. Monticone, C. Valagiannopoulos, and A. Alù, **"Aberration-Free Planar Focusing based on Parity-Time Symmetric Nonlocal Metamaterials,"** 2015 IEEE International Symposium on Antennas and Propagation and North American Radio Science Meeting, Vancouver, Canada, July 19-25, 2015.

[9] F. Monticone, C. Valagiannopoulos, S. Savoia, R. Fleury and A. Alù, **"Parity-Time Symmetric Nonlocal Metamaterials for Focusing and Image Processing,"** 2015 APS March Meeting, San Antonio, Texas, USA, March 2-6, 2015.

[10] F. Monticone, and A. Alù, **"Scattering Engineering: From Broadband Cloaking and Resonance Effects, to Embedded Scattering Eigenvalues in 3D Nanostructures,"** 8th International Congress on Advanced Electromagnetic Materials in Microwaves and Optics - Metamaterials 2014, Copenhagen, Denmark, August 25-30, 2014.

[11] C. Della Giovampaola, B. Edwards, A. Silva, F. Monticone, G. Castaldi, V. Galdi, A. Alù, N. Engheta **"Recent Progress in Metamaterials That Perform Mathematical Operations,"** 8th International Congress on Advanced Electromagnetic Materials in Microwaves and Optics - Metamaterials 2014, Copenhagen, Denmark, August 25-30, 2014.

[12] F. Monticone, V. Galdi, N. Engheta, and A. Alù, **" 'Computing Metasurfaces' to Perform Mathematical Operations,"** 2014 IEEE International Symposium on Antennas and Propagation and USNC-URSI National Radio Science Meeting, Memphis, Tennessee, USA, July 6-12, 2014.

[13] C. Della Giovampaola, B. Edwards, A. Silva, F. Monticone, G. Castaldi, V. Galdi, A. Alù, and N. Engheta, **"Waveguide-based Metamaterials as a Platform for Mathematical Operations,"** 2014 IEEE International Symposium on Antennas and Propagation and USNC-URSI National Radio Science Meeting, Memphis, Tennessee, USA, July 6-12, 2014.

[14] A. Silva, F. Monticone, G. Castaldi, V. Galdi, A. Alù, and N. Engheta, **"Meta-material-Based Analog Computing,"** Third Mediterranean Photonics Conference, Trani, Italy, May 7-9, 2014.

[15] F. Shafiei, F. Monticone, K. Le, X. Liu, T. Hartsfield, A. Alù, X. Li, **"Plasmonic Magnetic Nanostructure,"** 2014 APS March Meeting, Denver, CO, March 3-7, 2014.

[16] J. Shi, S. Elias, F. Monticone, Y. Wu, D. Ratchford, X. Li, and A. Alù, **"Assembling Three-Dimensional Optical Stereo-Nanocircuits,"** 2014 APS March Meeting, Denver, CO, March 3-7, 2014.

[17] F. Monticone, X. Li, and A. Alù, **"Boosting Optical Magnetism with Symmetry Breaking in a Subwavelength Plasmonic Metamolecule,"** Frontiers in Optics 2013, Orlando, FL, USA, October 6-10, 2013.

[18] F. Monticone, and A. Alù, **"Controlling the Nanoscale Optical Transmission with Single and Stacked Metasurfaces,"** Frontiers in Optics 2013, Orlando, FL, USA, October 6-10, 2013.

[19] F. Monticone, and A. Alù, **"On the Physical Bounds of Cloaking and Invisibility,"** 7th International Congress on Advanced Electromagnetic Materials in Microwaves and Optics - Metamaterials 2013, Bordeaux, France, September 16-21, 2013. **[best student paper award]**.

[20] A. Silva, F. Monticone, G. Castaldi, V. Galdi, A. Alù, and N. Engheta, **"Mathematical Manipulation with Metamaterials,"** 7th International Congress on Advanced Electromagnetic Materials in Microwaves and Optics - Metamaterials 2013, Bordeaux, France, September 16-21, 2013.

[21] F. Monticone, X. Li, and A. Alù, **"Strong Optical Magnetism and Fano Resonances in Asymmetric Plasmonic Metamolecules,"** 2013 IEEE International Symposium on Antennas and Propagation, Lake Buena Vista, FL, July 7-12, 2013.

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