Andrea Fratalocchi
King Abdullah University of Science and Technology
Computer, Electronic, Mathematical Sciences and Engineer (CEMSE)
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EDUCATION

Roma Tre University, Rome, Italy, 2003-2007
Ph.D. in Electrical Engineering
Dissertation Title: Energy dynamics in nonlinear optical lattices: from fundamentals to applications
Advisor: Prof. Gaetano Assanto

Roma Tre University, Rome, Italy, 1998-2003
MSc in Electrical Engineering
Dissertation Title: Discrete solitons in nonlinear waveguide arrays realized in liquid crystals
Advisor: Prof. Gaetano Assanto
In Italy we do not have a BS program, the University gives a MSc title after the completion of a 5 years program with no intermediate title.

PROFESSIONAL EXPERIENCE

1 Jan 2023 – Present Full Professor, CEMSE, KAUST University
1 Jul 2016 – 31 Dec 2022 Associate Professor, CEMSE, KAUST University
11-18 Oct 2015 Visiting Professor, Australia National University, Australia
17-24 March 2014 Visiting Professor, Harvard University, USA
4-12 Dec 2013 Visiting Professor, Harvard University, USA
25-31 May 2013 Visiting Professor, Harvard University, USA
24 Oct 2015 – 2 Nov 2012 Visiting Professor, National University of Singapore, Singapore
7-10 July 2012 Visiting Professor, INRS-EMT, Quebec University, Canada
22 May 2011 – 4 June 2011 Visiting Professor, Cambridge University, UK
14-21 May 2011 Visiting Professor, University of St. Andrews, UK
2011-2016 Assistant Professor, CEMSE, KAUST
2009-2011 Researcher, Sapienza University, Rome, Italy
2007-2009 "New Talent" Researcher at "Enrico Fermi" Research Center, Rome, Italy

RESEARCHER ID NUMBER

ORCId: 0000-0001-6769-4439
Web of Science Researcher ID: F-1056-2015
SCOPUS: 55926483600

HONORS AND SCHOLARLY AWARDS (Student or post-doc advisees are underlined)

- OSA Fellows Committee Board Member 2024-2026
- Fellow of Optica (former OSA), 2019
- Fellow of the Institute of Physics (IOP), 2019
- Senior Member of IEEE, 2019
- META Best Presentation Award – Awarder to PhD Student V. Mazzone for his work on Anapole chains, 2018
- GCC Enterprise Award as best electrical engineer of the year, 2017
- Journal of Optics Outstanding Referee Award, 2017

- Entered in the Guinness World Record for developing the "Darkest Material Made by Mankind", 2015
- Nature Exceptional Referee Award, 2015
- European Physics Lett. (EPL) Best Presentation Award - Awarded to PhD Student J. S. T. Gongora for the work `Superfocusing properties of disordered plasmonic nanolenses', 2014
- KAUST Dean Award - Awarded to PhD Student M. Bonifazi, 2014
- KAUST Dean Award - Awarded to PhD Student Y. Tian, 2013
- KAUST Provost Award - Awarded to PhD Student J. S. T. Gongora, 2012
- Nature Exceptional Referee Award, 2012
- KAUST Provost Award - Awarded to MS Student L. D. Toth, 2011

PROFESSIONAL AFFILIATIONS

Optica (Fellow), Institute of Physics (Fellow), IEEE (Senior Member), ACS, SPIE

PUBLICATIONS

***Since I joined KAUST I published a total of 207 publications:**

1) A total of **6** Patents
2) A total of **4** Peer-Reviewed Books
3) A total of **73** articles in peer-review journals (**12** Nature(s), **7** Advanced Material(s), **3** Nano Energy, **8** Laser & Photonics Reviews, **1** Science Advances, **2** Light: Sciences and Applications, **3** Nanophotonics, **2** Phys. Rev. Lett.)
4) A total of **50** Invited/Keynote/Plenary Talks in International peer-reviewed Conferences
5) A total of **74** proceedings in International peer-reviewed Conferences

I am in the top 2% in Optics Worldwide (Updated science-wide author databases of standardized citation indicators, PLOS, *https://doi.org/10.1371/journal.pbio.3000918*)

Publications at KAUST

Peer-Reviewed Books (*corresponding author; student or post-doc advisees are underlined)

1. F. Wang and A. Fratalocchi, **Metamaterials for high efficiency solar desalination with carbon zero emission**, Chapter in Book "**Thermal plasmonics and metamaterials for low-carbon society**", (CRC Press, 2024)

2. J. S. T. Gongora and A. Fratalocchi*, **Non-radiating sources**, Chapter in Book "**All-Dielectric Nanophotonics**", (Elsevier, 2023)
3. Gongora, Juan Sebastian Totero; Fratalocchi, Andrea*, "**AB-Initio techniques for light matter interaction at the nanoscale",** Computational Chemistry Methodology in Structural Biology and Materials Sciences, pp. 309–338, Apple Academic Press, Toronto; New Jersey: Apple Academic Press, 2017.
4. Gongora, Juan Sebastian Totero; Fratalocchi, Andrea*, **Harnessing Disorder at the Nanoscale**, Bhushan, Bharat (Ed.): Encyclopedia of Nanotechnology, pp. 1441–1453, Springer Netherlands, Dordrecht, 2016, ISBN: 978-94-017-9780-1.

Patents (student or post-doc advisees are underlined)

1. Fratalocchi, A; Lopez, Arturo B; Makarenko, M; Getman, F; Wang, Q, **Light Processing Device Based on Multilayer Nano-Elements** Patent 3918384 (published), 2021
2. Fratalocchi, A; Lopez, Arturo B; Makarenko, M; Getman, F; Wang, A, **HOCULUS (Hyplex) Imaging System** Patent USSN 63/277,741 (pending), 2021

3. Fratalocchi, A; Makarenko, M; Li, X; Lin, R; Fariborzi, H; Alshehri, Ali A; Yang, K, **Ultrafast integrated artificial intelligent optical chip** 2020, (US Patent 62/963,747).
4. Fratalocchi, A; Cruz, A M; Mazzone, V; Di Falco, A, **Optical encryption terminal, cryptography key distribution system and method of generating cryptography keys in a cryptography key distribution system,** 2020 Patent USPTO16132017.
5. Fratalocchi, A; Di Fabrizio, E; Gongora, Juan Sebastian T; Coluccio, Maria L; Candeloro, P; Cuda, G, **Analytic device including nanostructures,** Patent 10048211, 2017.
6. Fratalocchi, A; Mazzone, V; Bonifazi, M; Ashok, A; Aldawsari, A; **Integrated Bioreactor System**, Patent US-2022-0135919-A1, 2022.

Peer-Reviewed Journal Articles (*corresponding author; student or post-doc advisees are underlined)

1. Makarenko, M., Burguete-Lopez, A., Wang, Q. *et al.* **Hardware-accelerated integrated optoelectronic platform towards real-time high-resolution hyperspectral video understanding**. *Nat Commun* **15**, 7051 (2024). https://doi.org/10.1038/s41467-024-51406-6
2. Maksim Makarenko, Qizhou Wang, Arturo Burguete-Lopez, Andrea Fratalocchi; **Photonic optical accelerators: The future engine for the era of modern AI?**. *APL Photonics* 1 November 2023; 8 (11): 110902. https://doi.org/10.1063/5.0174044
3. T. K. Ng *et al*., "Globalization in Photonics Research and Development," in *IEEE Photonics Journal*, vol. 16, no. 1, pp. 1-9, Feb. 2024, Art no. 0600209, doi: 10.1109/JPHOT.2023.3337312
4. Burguete-Lopez, A., Makarenko, M., Bonifazi, M. *et al.* **Real-time simultaneous refractive index and thickness mapping of sub-cellular biology at the diffraction limit**. Commun Biol **7**, 154 (2024). https://doi.org/10.1038/s42003-024-05839-w
5. F. Xiang, N. Li, A. Burguete-Lopez, Z. He, M. Elizarov, A. Fratalocchi, **Light-Induced Quantum Reconfiguration of Oxyhydroxides for Photoanodes with 4.24% Efficiency and Stability Beyond 250 Hours**. *Adv. Mater.* 2024, 2405478. https://doi.org/10.1002/adma.202405478
6. N. Li, A. Fratalocchi, **Innovative Strategies for Photons Management on Ultrathin Silicon Solar Cells**. Global Challenges 2024, 8, 2300306. https://doi.org/10.1002/gch2.202300306
7. Martin Barkey, Rebecca Büchner, Alwin Wester, Stefanie D. Pritzl, Maksim Makarenko, Qizhou Wang, Thomas Weber, Stefan A. Maier, Andrea Fratalocchi, Theobald Lohmüller, and Andreas Tittl, **High-Q pixelated metasurfaces enable in-situ IR spectroscopy and explainable AI classification of photoswitchable lipid membranes**, ACS nano *18* (18), 11644-11654 (2024)
8. Xiang, Fei; Zhao, Xuhong; Yang, Jian; Li, Ning; Gong, Wenxiao; Liu, Yizhen; Burguete-Lopez, A.; Li, Yulan; Niu, Xiaobin; Fratalocchi, Andrea, **Enhanced Selectivity in the Electroproduction of H2O2 via F/S Dual-Doping in Metal-Free Nanofibers**, Adv. Mater. (2023) **[Cover]**
9. Li, N.; Xiang, F.; Elizarov, M. S.; Makarenko, M.; Lopez, A. B.; Getman, F.; Bonifazi, M.; Mazzone, V.; Fratalocchi, A.*, **Large-Scale and Wide-Gamut Coloration at the Diffraction Limit in Flexible, Self-Assembled Hierarchical Nanomaterials,** Adv. Mater. 2108013, 2022. **[Cover]**
10. M. Elizarov, Y. S. Kivshar, A. Fratalocchi*, **Inverse-designed metaphotonics for hypersensitive detection**, ACS Nanoscience Au (2022) **[Invited Article]**
11. Getman, F; Makarenko, M; Burguete-Lopez, A; Fratalocchi*, A, **Broadband vectorial ultrathin optics with experimental efficiency up to 99% in the visible region via universal approximators**, Light: Science & Applications, vol. 10, no. 1, pp. 47, 2021.
12. Li, Ning; Xiang, Fei; Fratalocchi, Andrea*, **Silicon-Based Photocatalysis for Green Chemical Fuels and Carbon Negative Technologies,** Advanced Sustainable Systems, pp. 2000242, 2021.

13. Li, HuangJingWei; Liu, Kang; Fu, Junwei; Chen, Kejun; Yang, Kexin; Lin, Yiyang; Yang, Baopeng; Wang, Qiyou; Pan, Hao; Cai, Zhoujun; Li, Hongmei; Cao, Maoqi; Hu, Junhua; Lu, Ying-Rui; Chan, Ting-Shan; Cortés, Emiliano; Fratalocchi, Andrea; Liu, Min*, **Paired Ru–O–Mo ensemble for efficient and stable alkaline hydrogen evolution reaction,** Nano Energy, vol. 82, pp. 105767, 2021, ISSN: 2211-2855.
14. Makarenko, Maksim; Wang, Qizhou; Burguete-Lopez, Arturo; Getman, Fedor; Fratalocchi, Andrea*, **Robust and Scalable Flat-Optics on Flexible Substrates via Evolutionary Neural Networks,** Advanced Intelligent Systems, 2100105, 2021.
15. Wang, Qizhou; Makarenko, Maksim; Burguete-Lopez, A.; Getman, Fedor; Fratalocchi, Andrea, **Advancing statistical learning and artificial intelligence in nanophotonics inverse design**, Nanophotonics, 2021.
16. Tunesi, J.; Peters, L.; Gongora, J. S. Totero; Olivieri, L.; Fratalocchi, Andrea; Pasquazi, A.; Peccianti, M., **Terahertz emission mediated by ultrafast time-varying metasurfaces**, Phys. Rev. Research vol. 3, L042006, 2021**.**
17. Mazzone, Valerio; Bonifazi, Marcella; Aegerter, Christof M.; Cruz, Aluizio M.; Fratalocchi, Andrea*, **Clean Carbon Cycle via High-Performing and Low-Cost Solar-Driven Production of Freshwater,** Advanced Sustainable Systems, 202100217, 2021.
18. Bogdanov, Andrey A.; Fratalocchi, Andrea; Kivshar, Yuri, **The science of harnessing light's darkness,** Nanophotonics, vol. 10, no. 17, pp. 4171–4173, 2021.
19. Gongora, Juan S. Totero; Fratalocchi, Andrea*, **Integrated nanolasers via complex engineering of radiationless states,** Journal of Physics: Photonics, vol. 3, no. 1, pp. 011001, 2020.
20. Makarenko, M; Burguete-Lopez, A; Getman, F; Fratalocchi, A*, **Generalized Maxwell projections for multi-mode network Photonics,** Scientific Reports, vol. 10, no. 1, pp. 9038, 2020, ISSN: 2045-2322.
21. Lin, Ronghui; Mazzone, Valerio; Alfaraj, Nasir; Liu, Jianping; Li, Xiaohang; Fratalocchi, Andrea*, **On-Chip Hyperuniform Lasers for Controllable Transitions in Disordered,** Laser & Photonics Reviews, vol. 14, no. 2, pp. 1800296, 2020.
22. Fu, Hui-Chun; Varadhan, Purushothaman; Tsai, Meng-Lin; Li, Wenjie; Ding, Qi; Lin, Chun-Ho; Bonifazi, Marcella; Fratalocchi, Andrea; Jin, Song; He, Hau*, **Improved performance and stability of photoelectrochemical water-splitting Si system using a bifacial design to decouple light harvesting and electrocatalysis,** Nano Energy, pp. 104478, 2020, ISSN: 2211-2855.
23. Tian, Y; Li, N; Bonifazi, M; Fratalocchi, A*, **Harnessing complex photonic systems for renewable,** Advances in Physics: X, vol. 5, no. 1, pp. 1768898, 2020.
24. Mazzone, Valerio; Falco, Andrea Di; Cruz, Al; Fratalocchi, Andrea*, **Photonics based perfect secrecy cryptography: Toward fully classical implementations,** Applied Physics Letters, vol. 116, no. 26, pp. 260502, 2020.
25. Fratalocchi, Andrea; Fleming, Adam; Conti, Claudio; Falco, Andrea Di Falco*, **NIST-certified secure key generation via deep learning of physical unclonable functions in silica aerogels**, Nanophotonics, pp. 20200368, 2020.
26. Bonifazi, Marcella; Mazzone, Valerio; Li, Ning; Tian, Yi; Fratalocchi, Andrea*, **Free-Electron Transparent Metasurfaces with Controllable Losses for Broadband Light Manipulation with Nanometer Resolution,** Advanced Optical Materials, vol. 8, no. 1, pp. 1900849, 2019.
27. Geraldi, Andrea; Laneve, Alessandro; Bonavena, Luis Diego; Sansoni, Linda; Ferraz, Jose; Fratalocchi, Andrea; Sciarrino, Fabio; Cuevas, Álvaro; Mataloni, Paolo*, **Experimental Investigation of Superdiffusion via Coherent Disordered Quantum Walks,** Phys. Rev. Lett., vol. 123, pp. 140501, 2019.
28. Sait, M; Mazzone, V; Fratalocchi, A*, **Broadband holography via structured black silicon nano-antennas,** Applied Sciences, vol. 9, no. 7, 2019.

29. Koshelev, K; Favraud, G; Bogdanov, A; Kivshar, Y; Fratalocchi, A*, **Nonradiating photonics with resonant dielectric nanostructures,** Nanophotonics, vol. 8, no. 5, pp. 725-745, 2019
30. Ma, Chun; Liu, Changxu; Huang, Jianfeng; Ma, Yuhui; Liu, Zhixiong; Li, Lain-Jong; Anthopoulos, Thomas D; Han, Yu; Fratalocchi, Andrea; Wu, Tom*, **Plasmonic-Enhanced Light Harvesting and Perovskite Solar Cell Performance Using Au Biometric Dimers with Broadband Structural Darkness,** Solar RRL, pp. 1900138, 2019.
31. Falco, A Di; Mazzone, V; Cruz, A; Fratalocchi, A*, **Perfect secrecy cryptography via mixing of chaotic waves in irreversible time-varying silicon chips,** Nature Communications, vol. 10, no. 1, pp. 5827, 2019, ISSN: 2041-1723.
32. Mao, P; Liu, C; Favraud, G; Chen, Q; Han, M; Fratalocchi, A*; Zhang, S*, **Broadband single molecule SERS detection designed by warped optical spaces,** Nature Communications, vol. 9, no. 1, 2018.
33. Favraud, G; Gongora, J S T; Fratalocchi, A*, **Evolutionary Photonics for Renewable Energy, Nanomedicine, and Advanced Material Engineering,** Laser and Photonics Reviews, vol. 12, no. 11, 2018
34. Lin, C -H; Li, T -Y; Cheng, B; Liu, C; Yang, C -W; Ke, J -J; Wei, T -C; Li, L -J; Fratalocchi, A; He, J -H*, **Metal contact and carrier transport in single crystalline CH 3 NH 3 PbBr 3 perovskite,** Nano Energy, vol. 53, pp. 817-827, 2018
35. Liu, Changxu; Huang, Jianfeng; Hsiung, Chia-En; Tian, Yi; Wang, Jianjian; Han, Yu; Fratalocchi, Andrea*, **High-Performance Large-Scale Solar Steam Generation with Nanolayers of Reusable Biomimetic Nanoparticles,** Advanced Sustainable Systems, vol. 1, no. 1-2, pp. 1600013, 2017.
36. Galinski, H; Favraud, G; Dong, H; Gongora, J S T; Favaro, G; Döbeli, M; Spolenak, R; Fratalocchi, A*; Capasso, F, **Scalable, ultra-resistant structural colors based on network metamaterials,** Light: Science and Applications, vol. 6, no. 5, e16233, 2017.
37. Tian, Y; de Arquer, F P García; Dinh, C -T; Favraud, G; Bonifazi, M; Li, J; Liu, M; Zhang, X; Zheng, X; Kibria, M G; Hoogland, S; Sinton, D; Sargent, E H; Fratalocchi, A*, **Enhanced Solar-to-Hydrogen Generation with Broadband Epsilon-Near-Zero Nanostructured Photocatalysts,** Advanced Materials, vol. 29, no. 27, 1701165, 2017
38. Gongora, J S Totero; Miroshnichenko, A E; Kivshar, Y S; Fratalocchi, A*, **Anapole nanolasers for mode-locking and ultrafast pulse generation,** Nature Communications, vol. 8, 2017
39. Mazzone, V; Gongora, J S T; Fratalocchi*, A. **Near-field coupling and mode competition in multiple anapole systems,** Applied Sciences (Switzerland), vol. 7, no. 6, 542, 2017
40. Li, F; Wang, H; Kufer, D; Liang, L; Yu, W; Alarousu, E; Ma, C; Li, Y; Liu, Z; Liu, C; Wei, N; Wang, F; Chen, L; Mohammed, O F; Fratalocchi, A; Liu, X; Konstantatos, G; Wu, T.*, **Ultrahigh Carrier Mobility Achieved in Photoresponsive Hybrid Perovskite Films via Coupling with Single-Walled Carbon Nanotubes,** Advanced Materials, vol. 29, no. 16, 1602432, 2017
41. Galinski, H; Fratalocchi, A; Döbeli, M; Capasso, F*, **Light Manipulation in Metallic Nanowire Networks with Functional Connectivity,** Advanced Optical Materials, vol. 5, no. 5, 1600580, 2017
42. Labelle, A J; Bonifazi, M; Tian, Y; Wong, C; Hoogland, S; Favraud, G; Walters, G; Sutherland, B; Liu, M; Li, J; Zhang, X; Kelley, S O; Sargent, E H; Fratalocchi, A*, **Broadband Epsilon-near-Zero Reflectors Enhance the Quantum Efficiency of Thin Solar Cells at Visible and Infrared Wavelengths,** ACS Applied Materials and Interfaces, vol. 9, no. 6, pp. 5536-5565, 2017
43. Gongora, J S Totero; Favraud, G; Fratalocchi, A*, **Fundamental and high-order anapoles in all-dielectric metamaterials via Fano-Feshbach modes competition,** Nanotechnology, vol. 28, no. 10, 104001, 2017
44. Bruck, R; Liu, C; Muskens, O L; Fratalocchi, A; Falco, A Di*, **Ultrafast all-optical order-to-chaos transition in silicon photonic crystal chips,** Laser and Photonics Reviews, vol. 10, no. 4, pp. 688-695, 2016.

45. Huang, J; Zhu, Y; Liu, C; Shi, Z; Fratalocchi, A; Han, Y*, **Unravelling Thiol's Role in Directing Asymmetric Growth of Au Nanorod-Au Nanoparticle Dimer**, Nano Letters, vol. 16, no. 1, pp. 617-623, 2016.
46. Gongora, J S T; Fratalocchi, A*, **Optical force on diseased blood cells: Towards the optical sorting of biological matter,** Optics and Lasers in Engineering, vol. 76, pp. 40-44, 2016.
47. Huang, J; Liu, C; Zhu, Y; Masala, S; Alarousu, E; Han, Y; Fratalocchi, A*, **Harnessing structural darkness in the visible and infrared wavelengths for a new source of light,** Nature Nanotechnology, vol. 11, no. 1, pp. 60-66, 2016.
48. Gongora, Juan Sebastian Totero; Miroshnichenko, Andrey E; Kivshar, Yuri S; Fratalocchi, Andrea*, **Energy equipartition and unidirectional emission in a spaser nanolaser,** Laser & Photonics Reviews, vol. 10, no. 3, pp. 432-440, 2016.
49. Liu, Changxu*; Huang, Jianfeng, **Physicist meets chemist,** Nature Nanotechnology, vol. 11, no. 1, pp. 104–104, 2016, ISSN: 1748-3387.
50. Liu, C; van der Wel, R E C; Rotenberg, N; Kuipers, L; Krauss, T F; Falco, A Di; Fratalocchi*, A, **Triggering extreme events at the nanoscale in photonic seas,** Nature Physics, vol. 11, no. 4, pp. 358–363, 2015, ISSN: 1745-2473.
51. Huang, J; Zhu, Y; Liu, C; Zhao, Y; Liu, Z; Hedhili, M N; Fratalocchi, A; Han, Y*, **Fabricating a Homogeneously Alloyed AuAg Shell on Au Nanorods to Achieve Strong, Stable, and Tunable Surface Plasmon Resonances,** Small, vol. 11, no. 39, pp. 5214-5221, 2015.
52. Coluccio, M L; Gentile, F; Das, G; Nicastri, A; Perri, A M; Candeloro, P; Perozziello, G; Zaccaria, R P; Gongora, J S T; Alrasheed, S; Fratalocchi, A; Limongi, T; Cuda, G; Fabrizio, E Di*, **Detection of single amino acid mutation in human breast cancer by disordered plasmonic self-similar chain**, Science Advances, vol. 1, no. 8, e1500487, 2015.
53. Liu, C; Wel, R E C Van Der; Rotenberg, N; Kuipers, L; Krauss, T F; Falco, A Di; Fratalocchi*, A, **Triggering extreme events at the nanoscale in photonic seas,** Nature Physics, vol. 11, no. 4, pp. 358-363, 2015.
54. Labelle, A J; Thon, S M; Masala, S; Adachi, M M; Dong, H; Farahani, M; Ip, A H; Fratalocchi, A; Sargent, E H*, **Colloidal quantum dot solar cells exploiting hierarchical structuring,** Nano Letters, vol. 15, no. 2, pp. 1101-1108, 2015.
55. Fratalocchi, A*; Dodson, C M; Zia, R; Genevet, P; Verhagen, E; Altug, H; Sorger, V J, **Nano-optics gets practical Early-career researchers share their thoughts on how to make use of the ability to manipulate light at the nanoscale,** Nature Nanotechnology, vol. 10, no. 1, pp. 11-15, 2015.
56. Ruocco, G; Fratalocchi, A*, **Period doubling induced by thermal noise amplification in genetic circuits,** Scientific Reports, vol. 4, 7088, 2014.
57. Liu, C; Falco, A Di; Fratalocchi, A*, **Dicke phase transition with multiple superradiant states in quantum chaotic resonators,** Physical Review X, vol. 4, no. 2, 2014.
58. Brambila, D S; Fratalocchi, A*, **Nonlinearly-enhanced energy transport in many dimensional quantum chaos,** Scientific Reports, vol. 3, 2359, 2013.
59. Liu, C; Falco, A Di; Molinari, D; Khan, Y; Ooi, B S; Krauss, T F; Fratalocchi, A*, **Enhanced energy storage in chaotic optical resonators,** Nature Photonics, vol. 7, no. 6, pp. 473-478, 2013.
60. Fratalocchi, A*, **Anderson localization: The role of quantum symmetries,** Nature Photonics, vol. 7, no. 4, pp. 271-273, 2013.
61. Marruzzo, A; Schirmacher, W; Fratalocchi, A; Ruocco, G*, **Heterogeneous shear elasticity of glasses: The origin of the boson peak,** Scientific Reports, vol. 3, 1407, 2013.
62. Marruzzo, A; Köhler, S; Fratalocchi, A; Ruocco, G; Schirmacher, W*, **Vibrational anomalies and marginal stability of glasses,** European Physical Journal: Special Topics, vol. 216, no. 1, pp. 83-93, 2013.
63. Crosta, M; Trillo, S; Fratalocchi, A*, **The Whitham approach to dispersive shocks in systems with cubic–quintic nonlinearities,** New Journal of Physics, vol. 14, no. 9, pp. 093019, 2012.

64. Molinari, D; Fratalocchi, A*, **Route to strong localization of light: The role of disorder,** Optics Express, vol. 20, no. 16, pp. 18156-18164, 2012.
65. Crosta, M; Fratalocchi, A; Trillo, S*, **Double shock dynamics induced by the saturation of defocusing nonlinearities,** Optics Letters, vol. 37, no. 10, pp. 1634-1636, 2012.
66. Falco, A Di; Krauss, T F; Fratalocchi, A*, **Lifetime statistics of quantum chaos studied by a multiscale analysis,** Applied Physics Letters, vol. 100, no. 18, 184101, 2012.
67. Allsopp, N; Ruocco, G; Fratalocchi, A*, **Molecular dynamics beyonds the limits: Massive scaling on 72 racks of a BlueGene/P and supercooled glass dynamics of a 1 billion particles system,** Journal of Computational Physics, vol. 231, no. 8, pp. 3432-3445, 2012.
68. Crosta, M; Trillo, S; Fratalocchi, A*, **Crossover dynamics of dispersive shocks in Bose-Einstein condensates characterized by two- and three-body interactions,** Physical Review A - Atomic, Molecular, and Optical Physics, vol. 85, no. 4, 043607, 2012.
69. Fratalocchi, A; Armaroli, A; Trillo, S*, **Time-reversal focusing of an expanding soliton gas in disordered replicas,** Phys. Rev. A, vol. 83, pp. 053846, 2011.
70. Fratalocchi, A; Ruocco, G*, **Single-Molecule Imaging with X-Ray Free-Electron Lasers: Dream or Reality?** Phys. Rev. Lett., vol. 106, pp. 105504, 2011.
71. Crosta, M; Fratalocchi, A; Trillo, S*, **Bistability and instability of dark-antidark solitons in the cubic-quintic nonlinear Schrödinger equation,** Physical Review A - Atomic, Molecular, and Optical Physics, vol. 84, no. 6, 063809, 2011.
72. Fratalocchi, A*, **Mode-locked lasers: Light condensation,** Nature Photonics, vol. 4, no. 8, pp. 502-503, 2010.
73. Fratalocchi, A*, **Statistical analysis of complex systems with nonclassical invariant measures,** Physical Review E - Statistical, Nonlinear, and Soft Matter Physics, vol. 83, no. 2, 021116, 2011.

CONFERENCES

Invited, Keyonte and Plenary Speaker

1. A. Fratalocchi, “Universal light encoders: artificial intelligent optical hardware for real-time hyperspectral imaging and ultrasensitive detection”, AES 2023. [**Keynote**]
2. A. Fratalocchi, “Large-area Metasurfaces for High-definition Structural Coloration and Stable, Efficient Water-splitting”, PIERS 2023 [**Invited**]
3. A. Fratalocchi, “Real-time, High-resolution Hyperspectral Video Understanding and Ultrasensitive Detection via Universal Light Encoders”, PIERS 2023 [**Invited**]
4. A. Fratalocchi, “High-resolution and real-time hyperspectral imaging with universal light encoders”, SPIE Photonics WEST 2023. **[Invited]**
5. A. Fratalocchi, “Universal light encoders: next-generation artificial intelligent hardware”, International School on advanced studies on machine learning Photonics, 2022. **[Invited]**
6. A. Fratalocchi, “Carbon negative metamaterial technologies”, META 2022**. [Invited]**
7. A. Fratalocchi, “Universal light encoders: artificial intelligent photonics hardware for next generation ultra-flat optics and vision systems”, International Forum for Advanced Photonics, Zhejiang University, Hangzhou, China, June 1, 2022. **[Invited]**
8. A. Fratalocchi, “Universal light encoders for next generation artificial intelligent hardware in optical systems and hyperspectral imaging”, 2nd Colloquium on the physics and applications of metasurfaces, Florence, Italy, July 18-22 2022. **[Invited]**
9. A. Fratalocchi, A route to experimental artificial intelligence metasurfaces: from components to integrated systems, SPIE Photonics Europe, Strasbourg, 3-7 April 2022, France. **[Invited]**
10. A. Fratalocchi, Inverse design of photonic devices, International Conference on Photonics in Switching and Computing (PSC), 3-7 July, Toyama, Japan, 2022 **[Invited]**

11. A. Fratalocchi, “Universal light encoders: artificial intelligence hardware for light processing components and integrated systems” in AES 2022, the 8th International Conference on Antennas and Electromag-netic Systems, May 24, 2022 – May 27, 2022, Marrakesh (Morocco) **[Invited]**
12. A. Fratalocchi, Artificial intelligence enabled high-performance ultra-flat optics for vectorial light management: from components to integrated systems, Smart nanomaterials 2022, 7-10 December, Paris **[Invited]**
13. A. Fratalocchi, Inverse design of Metamaterials with almost ideal efficiency for vision, Workshop on visual applications of flexible metasurfaces, Metamaterial center, University of Exter, 13 December 2022, UK. **[Invited]**
14. A. Fratalocchi, Broadband vectorial ultra-flat optics with up to 99% experimental efficiency in the visible, MetaNANO 2020, 14-18 September. **[Invited]**
15. A. Fratalocchi, Advanced and inexpensive solar desalination systems, META2020, July 22, 2020 **[Invited]**
16. A. Fratalocchi, Complex materials created by warped spaces for energy harvesting, bio-imaging, and broadband light control at the nanoscale, META 2019, July 25, 2019 **[Invited]**
17. A. Fratalocchi, “Machine learning metamaterials with 99% experi-mental efficiency and 50 nm thickness for broadband vectorial light control”,Artificial Intelligence in nanophotonics (IWANNWorkshop) (2019), July 9, 2019 **[Invited]**
18. A. Fratalocchi, “Ultra-flat meta-optics with experimental efficiency exceeding 98% in the visible for vectorial light control designed via artificial intelligence”,US/Middle East Conference on Photonics ,CUNY, NewYork (2019) **[Invited]**
19. "Optical neurocomputing with anapoles", METANANO 2019 15 - 19 July 2019 St. Petersburg, Russia **[Invited]**
20. A. Fratalocchi. Controlling light via nanoscale oxides. METANANO. Sochi, Aug. 2018. **[Keynote Talk]**
21. A. Fratalocchi, harnessing broadband light in nanoscale materials via geometrical deformations. Invited talk at “EU ERC conference spatiotemporal mode complexity”. Sep 2018. **[Invited]**
22. A. Fratalocchi. Evolutionary Photonics, META 18, Jul 2018. **[Plenary Talk]**
23. A. Fratalocchi. Applications of complex photonics. Invited lecture at ITMO Doctoral school on nanophotonics 2018. June 2018. **[Invited]**
24. A. Fratalocchi. Evolutionary Photonics and the imitation game of Nature, at the Schrödinger Colloquium, University of Zurich, Switzerland. Nov. 2018. **[Honorary Lecture]**
25. A. Fratalocchi. Towards Photonics "Dark matter": Anapole integrated lasers, SPIE Optics and Photonics Congress, 6-10 Aug. 2017 in San Diego, CA, USA. **[Invited]**
26. A. Fratalocchi. Epislon near zero Photonics for Photocatalysis and record efficient Photovoltaics, Discrete, Nonlinear and Disordered Optics (08 - 12 May 2017), Max Plank Institute, Germany. **[Invited]**
27. A. Fratalocchi. Anapole Nanolasers, META'17, the 8th International Conference on Metamaterials, Photonic Crystals and Plasmonics, Incheon - Seoul, South Korea July 25 – 28, 2017. **[Invited]**
28. A. Fratalocchi. Complex Epsilon Near Zero metamaterials, The 8th International Conference on Surface Plasmon Photonics, May 22-26, 2017 Taipei, Taiwan **[Invited]**
29. A. Fratalocchi. Engineering complex nanolasers: from spaser quantum information sources to near-field anapole lasers, Photonics WEST, 28 January - 2 February 2017 , San Francisco (US) **[Invited]**
30. A. Fratalocchi, On-chip, ultrafast pulse generation with near-field anapole nanolasers, vol. Part F52-IPRSN 2017, 2017.
31. A. Fratalocchi, Dark chameleon nanoparticles for lasing and water purification, META 2016, 25-28 July, Spain. **[Invited]**

32. A. Fratalocchi, Dark metamaterial lasers, Disorder, Interactions, Turbulence and Wave Dynamics: Fundamentals and Applications, 2-6 May 2016, Turkey. **[Invited]**
33. A. Fratalocchi, Femtosecond dynamics of the spaser and "dark" metamaterial lasers, Nonlinear waves - Theory and Applications, June 2016, Beijing, China. **[Invited]**
34. A. Fratalocchi. Evolutionary photonics, CHAOS 2016 (http://www.cmsim.org), London, May 23-26 2016. **[Invited]**
35. A. Fratalocchi, Evolutionary Photonics technologies and nanomaterials for energy harvesting and lasing, Energy, Materials and Nanotechnology workshop on Quantum Technology, April 2016, Thailand. **[Invited]**
36. A. Fratalocchi, Evolutionary Photonics: a review of recent results. Year-of-light Conference Photonics Middle East, Dec. 2015, Qatar. **[Invited]**
37. A. Fratalocchi, Disordered black-body lasers and neuromorphic metamaterials, Asia Communications and Photonics Conference 2015 (ACP 2015), Hong-Kong, Nov. 2015. **[Invited]**
38. A. Fratalocchi, Evolutionary Photonics, NANOMETA15, Seefeld, Austria, 4-8 Jan. 2015. **[Invited]**
39. A. Fratalocchi, Evolutionary Photonics: from chaotic energy harvesting to black-body lasers, Energy, Material and Nanotechnology on optoelectronics, April 11-14 (2015), Beijing, China. **[Invited]**
40. A. Fratalocchi, Evolutionary Photonics: dark nanomaterials for energy harvesting, Energy, Material and Nanotechnology on quantum technologies, April 24-27 (2015), Beijing, China. **[Invited]**
41. A. Fratalocchi, Evolutionary Photonics with a twist, PIERS 2015 Prague, July 6-9 Czech Republic. **[Invited]**
42. A. Fratalocchi, Dark nanolasers, Nonlinear Photonics: Theory, Materials, Applications, 29 June - 02 July, 2015, St. Petersburg, Russia. **[Invited]**
43. A. Fratalocchi, Black-body lasers, The Annual Laser Physics Workshop 2015, Shanghai, China, August 21-25, 2015. **[Invited]**
44. A. Fratalocchi, Dark metamaterials, 5th Annual World Congress of Nano Science and Technology, September 24-26, 2015, Xian, China. **[Invited]**
45. A. Fratalocchi, Complexity-Driven Photonics, The Nonlinear Meeting 17-22 May 2014, Edimburg, UK (This conference has selected the 50 most famous nonlinear scientists in the world) **[Invited]**
46. A. Fratalocchi, When disorder is just right, META-14, 20-23 May 2014, Singapore. **[Invited]**
47. A. Fratalocchi, Complex Optics, Laser Optics 2014, 30 June- 4 July 2014, St. Petersburg. **[Invited]**
48. A. Fratalocchi, Complexity-Driven architectures for light, IEEE Photonics Conference, 12-16 October 2014, San Diego, CA (USA). **[Invited]**
49. A. Fratalocchi, A brief lecture on light and complexity, Advances in Nonlinear Photonics, 29 Sep.-3 Oct. 2014, Minsk, Belarus. **[Plenary Talk]**
50. A. Fratalocchi, dispersive shock waves in Schrodinger systems with random and high order nonlinear effects,The Eighth IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, March 25-28, 2013 Georgia Center for Continuing Education University of Georgia, Athens, GA, USA. **[Invited]**
51. A. Fratalocchi, Disordered driven Photonics, Photonics North 2013, Ottawa, June 3-5, Canada. **[Invited]**
52. A. Fratalocchi, Enlightening complexity, CLEO Europe, 12-16 may 2013, Munich, Germany. **[Invited]**
53. A. Fratalocchi, Complex Photonics: getting inspiration from Nature, Photonica 2013, 24-28 August, Belgrade, Serbia. **[Invited]**

Selected Peer-Reviewed Conference Proceedings of my Students (*Platform Speaker; **Poster; Student or post-doc advisees are underlined)

1. Elizarov, Maxim; Li, Ning; Fratalocchi, Andrea, "Laser-Induced Engineering of Nanomaterial Phase and Shape for 3D Light Control at the Nanoscale", 10.1109/cleo/europe-eqec57999.2023.10232276
2. Makarenko, Maksim; Burguete-Lopez, A.; Wang, Qizhou; Getman, Fedor; Giancola, Silvio; Ghanem, "Metasurface Light Encoders Enable Real-Time Hyperspectral Imaging and Video Understanding", 10.1109/cleo/europe-eqec57999.2023.10231864
3. Li, Ning; Wang, Qizhou; He, Zhao; Burguete-Lopez, A.; Xiang, Fei; Fratalocchi, Andrea, "Machine Learning Empowers Large-Scale Optical Sensors for Ultrasensitive Detection", 10.1109/cleo/europe-eqec57999.2023.10231928
4. Xiang, Fei; Li, Ning; Burguete-Lopez, A.; He, Zhao; Elizarov, Maxim; Fratalocchi, Andrea, "Record Efficient and Stable Si-Based Photoanodes Enabled by Ultrathin Transition-Metal Alloy Film for Solar-Assisted Water Splitting", 10.1109/cleo/europe-eqec57999.2023.10232261
5. Burguete-Lopez, A.; Makarenko, Maksim; Wang, Qizhou; Getman, Fedor; Fratalocchi, Andrea, "Metrology System Based on Metasurface Implementation of Artificial Inteligence", 10.1109/cleo/europe-eqec57999.2023.10231970
6. Wang, Qizhou; Fu, Qiang; Maksim, Makarenko; Lopez, Arturo Burguete; Heidrich, Wolfgang; Fratalocchi, "Data-driven Broadband Achromatic Metalens via First-principle End-to-end Inverse Design", 10.1364/cleo at.2023.jw2a.93
7. Fei Xiang, Xuhong Zhao, Jian Yang, Ning Li, Xiaobin Niu, Andrea Fratalocchi, "Highly active and selective metal-free nanofibers for H2O2 electroproduction via F/S dual-doping", ACS Spring 2023
8. Maxim Elizarov, Yuri S. Kivshar, and Andrea Fratalocchi, "Compact sensor based on inversely designed ultrahigh RI metamaterial", Photonics West 2023

9. M. Makarenko, A. Burguete-Lopez, Qizhou Wang, F. Getman, A. Fratalocchi, "High-resolution and real-time hyperspectral imaging with universal light encoders", Photonics West 2023
10. Q. Wang, Q. Fu, M. Makarenko, A. Lopez, W. Heidrich, and A. Fratalocchi, "Data-driven Broadband Achromatic Metalens via First-principle End-to-end Inverse Design," in CLEO 2023, Technical Digest Series (Optica Publishing Group, 2023), paper JW2A.93.
11. A. Burguete-Lopez, M. Makarenko, Q. Wang, F. Getman, and A. Fratalocchi, "Artificial-Intelligence Empowered Universal Metrology Optical Camera," in CLEO 2023, Technical Digest Series (Optica Publishing Group, 2023), paper JTu2A.25.
12. M. Makarenko, A. Burguete-Lopez, Q. Wang, F. Getman, S. Giancola, B. Ghanem, and A. Fratalocchi, "Real-time hyperspectral video understanding via universal metasurface encoders," in CLEO 2023, Technical Digest Series (Optica Publishing Group, 2023), paper AW3K.3.
13. Elizarov, Maxim; Fratalocchi, Andrea, "Subwavelength optical waveguiding via inverse designed deformation of reflective surface", CLEO (2022)
14. Getman, Fedor; Makarenko, M.; Wang, Q.; Burguete-Lopez, A.; Fratalocchi, Andrea, "Use of neural networks fro designing robust flat-optics on flexible substrates", CLEO (2022)
15. F. Xiang, Ning Li, and Andrea Fratalocchi, "Engineering Si-based photoanode with ultra-thin transition-metal alloy film for efficient and stable photoelectrochemical water oxidation", ACS Fall 2022
16. Fei Xiang, Xuhong Zhao, Jian Yang, Ning Li, Wenxiao Gong, Yizhen Liu, Arturo Burguete-Lopez, Yulan Li, Xiaobin Niu, and Andrea Fratalocchi, "Manipulating the selectivity towards H_2O_2 electroproduction on metal-free carbon nanofibers: Synergistic effect of intermolecular charge transfer coupled with electron spin redistribution", ACS Fall 2022

17. M. Makarenko, A. Burguete-Lopez, Q. Wang, F. Getman, Silvio Giancola, Bernard Ghanem, A. Fratalocchi*, “Real-time Hyperspectral Imaging in Hardware via Trained Metasurface Encoders”, CVPR, 2022. **[Top 5 accepted paper]**
18. Arturo Burguete-Lopez, Maksim Makarenko, Fedor Getman, Andrea Fratalocchi, ”Cellular refractive index and thickness recovery via unsupervised learning framework " SPIE Photonics West 2022
19. Qizhou Wang, Arturo Burguete-Lopez, Maksim Makarenko, Fedor Getman, Andrea Fratalocchi, “Robust and scalable flat-optics on flexible substrates through evolutionary neural networks,” SPIE Photonics West 2022
20. Maksim Makarenko, Qizhou Wang, Arturo Burguete-Lopez, Fedor Getman, Andrea Fratalocchi, “Neural network-aided design and fabrication of deformation robust flexible flat optics,” SPIE Photonics West 2022
21. Qizhou Wang, Arturo Burguete-Lopez, Maksim Makarenko, Fedor Getman, Andrea Fratalocchi, “Robust Flat Optics for Broadband Light Control on Flexible Substrates,” OSA Advanced Photonics Congress 2021
22. Fedor Getman, Arturo Burguete-Lopez, Maksim Makarenko, Andrea Fratalocchi, “Broadband vectorial ultra-flat optics with up to 99% experimental efficiency in the visible,” META 2021
23. Arturo Burguete-Lopez, Maksim Makarenko, Fedor Getman, Andrea Fratalocchi, “Metasurface Enabled Single Measurement Recovery of Thickness and Refractive Index Maps of Cells,” OSA Optical Design and Fabrication Congress 2021
24. Qizhou Wang, Arturo Burguete-Lopez, Maksim Makarenko, Fedor Getman, Andrea Fratalocchi, “Highly-efficient flat-optics inverse design platform via fast trained neural predictors,” OSA Optical Design and Fabrication Congress 2021
25. Fedor Getman, Qizhou Wang, Arturo Burguete-Lopez, Maksim Makarenko, Andrea Fratalocchi, “Artificial-intelligence enhanced bio-mimetic eye color camera,” OSA Optical Design and Fabrication Congress 2021
26. Arturo Burguete-Lopez, Maksim Makarenko, Qizhou Wang, Fedor Getman, Andrea Fratalocchi, “Metasurface design platform for highly efficient wavefront engineering,” CLEO EU 2021
27. Arturo Burguete-Lopez, Maksim Makarenko, Fedor Getman, Qizhou Wang, Andrea Fratalocchi, “Complete High Performance Silicon Flat Optics at Visible Wavelength,” CLEO US 2021
28. Arturo Burguete-Lopez, Maksim Makarenko, Fedor Getman, Qizhou Wang, Andrea Fratalocchi, “Artificial-intelligence Assisted, Label-free Imaging of Sub-cellular Biology,” OSA Biophotonics Congress: Optics in the Life Sciences 2021
29. Arturo Burguete-Lopez, Maksim Makarenko, Fedor Getman, Qizhou Wang, Andrea Fratalocchi, “Learning framework for unsupervised cellular refractive index and thickness measurement,” Frontiers in Optics & Laser Science 2021
30. Maksim Makarenko, Arturo Burguete-Lopez, Fedor Getman, Qizhou Wang Andrea Fratalocchi, “Robust Flat Optics for Broadband Light Control on Flexible Substrates,” METANANO 2021
31. Ning Li, Andrea Fratalocchi, “Wide gamut, single-wafer, flexible structural coloration via wet chemistry with resolution beyond diffraction limit,” CLEO 2021, San Jose McEnery Convention Center, San Jose, CA, United States
32. Ning Li, Andrea Fratalocchi, “Large-scale, high-resolution, wide-gamut structural coloration of flexible substrate,” CLEO/Europe EQEC 2021, Munich, Germany
33. Ning Li, Fei Xiang, Maxim S. Elizarov, Maksim Makarenko, Arturo B. Lopez, Fedor Getman, Andrea Fratalocchi, “Large-scale, >100000DPI full color gamut on rigid and flexible substrates with self-assembled hierarchical nanostructures,” OSA Advanced Photonics Congress 2021, Le Centre Sheraton Montreal Hotel, Montreal, Quebec, Canada

34. Arturo Burguete-Lopez, Maksim Makarenko, Fedor Getman, Andrea Fratalocchi, “Refractive index and thickness mapping of cells from color photographs”, SPIE photonics west, (6 - 11 March 2021)
35. Arturo Burguete-Lopez, Maksim Makarenko, Fedor Getman, Andrea Fratalocchi, “Broadband vectorial ultraflat optics with up to 99% experimental efficiency in the visible”, META, (20-23 July 2021.)
36. Maksim Makarenko, Fedor Getman, Arturo Burguete-Lopez,Andrea Fratalocchi, “Ultra-flat optics design platform for a high-efficient wavefront engineering”, META, 20-23 July 2021.
37. Fedor Getman, Arturo Burguete-Lopez, Maksim Makarenko, Andrea Fratalocchi, “Broadband Vectorial Ultra- Flat Optics With Up To 99% Experimental Efficiency In The Visible”, METANANO, (16 September 2020) **[Invited]**
38. M. Elizarov and A. Fratalocchi, “Subwavelength optical waveguiding via transformation optics approach”, METANANO 2021
39. A. Burguete-Lopez, F. Getman, M. Makarenko, A. Fratalocchi,”Inverse designed flat optics with 99% experimental efficiency in the visible”, ICLO, (2 November 2020)
40. A. Burguete-Lopez, F. Getman, M. Makarenko & A. Fratalocchi, “Broadband Ultra-flat Optics With Experimental Efficiencies Exceeding 99% at Visible Wavelengths”, CLEO Pacific Rim, (2 August 2020)
41. Burguete-Lopez, Arturo; Getman, Fedor; Makarenko, Maksim, Fratalocchi, Andrea, “Broadband Ultra-flat Optics with Experimental Efficiencies Exceeding 99% at Visible Wavelengths,” CLEO US, 10.1364/CLEOPR.2020.C1E_3, 2020
42. Arturo Burguete Lopez, Maksim Makarenko, Fedor Getman, Andrea Fratalocchi, "Artificial intelligence inverse design of ultra-flat meta-optics with experimental efficiencies exceeding 99% in the visible”, SPIE Photonics West 2020
43. Ning Li, Andrea Fratalocchi, "High-resolution and wide gamut nanoprinting of structural colors on cm-large areas”, SPIE Photonics West 2020
44. Redha Al Ibrahim, Andrea Fratalocchi, "Ultra-low power laser nano-printing of structural color and high resolution optical circuits”, SPIE Photonics West 2020
45. Marcella Bonifazi, Valerio Mazzone, Andrea Fratalocchi, Complex epsilon-near-zero materials enhances light absorption in ultra-thin solar cells,” META 2019
46. Tunesi, J.; Peters, L.; Gongora, J. S. Totero; Pasquazi, A.; Fratalocchi, Andrea; Peccianti, M, “Terahertz Time- Dependent Random Metamaterials”, OSA Advanced Photonics Congress (AP) 2019, paper NoTh3B, 2019
47. Tunesi, J.; Peters, L.; Gongora, J. S. Totero; Pasquazi, A.; Fratalocchi, Andrea; Peccianti, M., “Optically-Induced Dynamic Terahertz Metamaterials,” CLEO US, 10.1109/CLEOE-EQEC.2019.8872484
48. Yi Tian, Francisco Pelayo Garcia de Arquer, Cao-Thang Dinh, Gael Favraud, Marcella Bonifazi, Min Liu, Sjoerd Hoogland, Edward H. Sargent, Andrea Fratalocchi, “3D Multi-scale Nanostructured Plasmonic Materials for Record Efficient Hot-Carriers Based Photocatalysis,” META 2018
49. Bonifazi, M; Tian, Y; Fratalocchi, A*, “Complex epsilon-near-zero metamaterials for broadband light harvesting systems,” Proceedings of SPIE - The International Society for Optical Engineering vol. 10527, 2018.
50. Marcella Bonifazi, Valerio Mazzone, Andrea Fratalocchi, “Metal free, X-ray fabricated metamaterials reproduce full CYMK chromaticity system with 80 nm spatial resolution,” META 2018
51. Valerio Mazzone, Juan Sebastian Totero Gongora, Andrea Fratalocchi, “Near-field coupling and mode competition in anapole system,” META 2018 **[BEST PRESENTATION AWARD]**
52. Marcella Bonifazi, Yi Tian, Andrea Fratalocchi, “Broadband enhancement of light absorption in energy harvesting systems by complex epsilonnear- zero materials,” META 2018

53. Gael Favraud, Marcella Bonifazi, Valerio Mazzone, Yi Tian, Andrea Fratalocchi, “Artificial Intelligence Based Complex ENZ Network Nanomaterials for Large Scale Microprinting, Broadband Holograms and Bio-imaging,” META 2018
54. L. Peters, J.S. Totero Gongora, J. Tunesi, A. Pasquazi, A. Fratalocchi, and M. Peccianti, “Photo-induced THz Plasmonics in Black Silicon,” Advanced Photonics 2018.
55. Peters,; Gongora, J S T; Tunesi, J; Pasquazi, A; Fratalocchi, A; Peccianti, M, “Photo-induced THz Plasmonics in Black Silicon**,”** vol. Part F101-IPRSN 2018, 2018.
56. Bonifazi, Marcella; Mazzone, Valerio; Fratalocchi, Andrea, “X-ray created metamaterials: applications to metal-free structural colors with full chromaticity spectrum and 80 nm spatial resolution,” CLEO US, 10.1364/cleo_at.2018.jw2a.115, 2018
57. Luke Peters, Juan S. Totero Gongora, Jacob D. Tunesi, Andrea Fratalocchi, Alessia Pasquazi and Marco Peccianti, “Route to photo-enabled random terahertz metasurfaces,” Advanced Photonics, OSA Technical Digest (Optical Society of America, 2017), paper IM2A.5, 2017
58. Gongora, J. S. Totero; Miroshnichenko, Andrey E.; Kivshar, Yuri S.; Fratalocchi, Andrea, “Engineering complex nanolasers: from spaser quantum information sources to near-field anapole Lasers” Integrated Optics: Devices, Materials, and Technologies XXI, 10.1117/12.2249497, 2017
59. Gongora, J. S. Totero; Miroshnichenko, Andrey E.; Kivshar, Yuri S.; Fratalocchi, Andrea, “Ultrafast pulse generation in integrated arrays of anapole nanolasers,” CLEO EU, 10.1109/cleoe-eqec.2017.8086531, 2017
60. Mazzone, Valerio; Bonifazi, Marcella; Fratalocchi, Andrea, “Structural colours via metal free disordered nanostructures with nm resolution and full CYMK colour spectrum,” CLEO EU, 10.1109/CLEOE-EQEC.2017.8087092, 2017
61. Bonifazi, Marcella; Fu, Hui-chun; He, Jr-Hau; Fratalocchi, Andrea, “High performance nanostructured Silicon heterojunction for water splitting on large scales,” CLEO EU, 10.1109/CLEOE-EQEC.2017.8086647, 2017
62. Gongora, J. S. Totero; Miroshnichenko, Andrey; Kivshar, Yuri; Fratalocchi, Andrea, “On-chip Ultrafast Pulse Generator Based on Integrated Near-field Anapole Lasers,” CLEO US, 10.1364/CLEO_AT.2017.JTu5A.69, 2017.
63. Mazzone, Valerio; Di Falco, Andrea; Fratalocchi, Andrea, “Ultra-fast secure communication with complex systems in classical channels,” SPIE Photonics West, 10.1117/12.2251940||10.1117/12.2251940.5393348501001, 2017
64. Gongora, J. S. Totero; Miroshnichenko, Andrey E.; Kivshar, Yuri S.; Fratalocchi, Andrea, “Engineering complex nanolasers: from spaser quantum information sources to near-field anapole Lasers,” Integrated Optics: Devices, Materials, and Technologies XXI, 10.1117/12.2249497, 2017
65. Marcella Bonifazi, Valerio Mazzone, Andrea Fratalocchi, “Metal free structural colors via disordered nanostructures with nm resolution and full CYMK color spectrum” Photonics West, San Francisco 2017, USA.
66. Totero Gongora, Juan Sebastian; Miroshnichenko, Andrey E.; Kivshar, Yuri S.; Fratalocchi, Andrea, “Towards Nanoscale Quantum Information Sources with Spaser Technology”, 2016 QELS (OSA, USA) Fundamental Science, Paper# FTh4A.5.
67. Liu, Changxu; Huang, Jianfeng; Han, Yu; Fratalocchi, Andrea, “Bio-inspired ultra dark nanoparticles for lasing and water desalination,” 2016 CLEO (OSA, USA): Applications and Technology, Paper#JW2A.91.
68. Totero Gongora, Juan Sebastian; Miroshnichenko, Andrey E.; Kivshar, Yuri S.; Fratalocchi, Andrea, “Near-Field Nanolasers based on Nonradiating Anapole Modes,” 2016 QELS (OSA, USA) Fundamental Science, Paper# FTh3A.7.
69. Totero Gongora, Juan Sebastian; Miroshnichenko, Andrey E.; Kivshar, Yuri S.; Fratalocchi, Andrea, “Nonlinear emission from dark anapole modes and route to all-dielectric metamaterial near-field lasers,” 2016 Nonlinear Photonics (OSA), Paper# NT3A.2.

70. Marcella Bonifazi, Hui-Chun Fu, Jr Hau He, Andrea Fratalocchi, “Disordered metamaterials achieve broadband enhancement of quantum effciency of photoelectrochemical devices for water splitting”, META 16, the 7th International Conference on Metamaterials, Photonic Crystals and Plasmonics, Spain 2016.
71. Gongora, J.S.T., Miroshnichenko, A.E., Kivshar, Y.S., Fratalocchi, A., “Femtosecond dynamics of a spaser and unidirectional emission from a perfectly spherical nanoparticle”, CLEO: QELS - Fundamental Science, CLEO_QELS 2015.
72. Di Falco, A., Liu, C., Krauss, T.F., Fratalocchi, A., “Chaotic behaviour of photonic crystals resonators”Proceedings of SPIE - The International Society for Optical Engineering, 9370, art. no. 93700R, 2015.
73. Liu, C., Huang, J., Masala, S., Alarousu, E., Han, Y., Fratalocchi, A., “Blackbody metamaterial lasers” CLEO: QELS - Fundamental Science, CLEO_QELS, p. 1551p., 2015
74. Gongora, J.S.T., Miroshnichenko, A.E., Kivshar, Y.S., Fratalocchi, A., “Femtosecond dynamics of a spaser and unidirectional emission from a perfectly spherical nanoparticle”, CLEO: Science and Innovations, CLEO-SI, p. 2267, 2015
75. Totero Gongora, J.S., Miroshnichenko, A.E., Kivshar, Y.S., Fratalocchi, A., “Femtosecond dynamics of a spaser and unidirectional emission from a perfectly spherical nanoparticle”, CLEO: Applications and Technology, CLEO-AT 2015, art. no. JTu5A.5, 1012 p.
76. Liu, C., Van Derwel, R., Rotenberg, N., Kuipers, L., Krauss, T.F., Di Falco, A., Fratalocchi, A., “Extreme localization of light with femtosecond subwavelength Rogue waves”, CLEO: Science and Innovations, CLEO-SI 2015, p. 2267.
77. J.S. Totero Gongora, Coluccio, M.L., Zaccaria, R.P., di Fabrizio, E.M., Fratalocchi, A. “Superfocusing properties of disorder-enhanced plasmonic nanolenses,” META14, Singapore (2014). **[invited]**
78. J.S. Totero Gongora, “The role of disorder in plasmonic devices for biological applications, 3rd International Summit on Integrative Biology”, Chicago, Aug. 4-5 2014. **[invited]**
79. C. Liu, A di Falco, T.F. Krauss and A. Fratalocchi, “Bio-inspired, broadband light harvesting based on chaotic resonator”, Energy Symposium on Bio-Inspired Ideas for Sustainable Energy, Toronto, October 2014. **[invited]**
80. C. Liu, A. Di Falco, T.F. Krauss, A. Fratalocchi, “Broadband trapping of light in optical resonators by the assistance of chaos”, EMN EAST Meeting (Energy Materials Nanotechnology), Beijing, China (2014). **[invited]**
81. Liu, C., Di Falco, A., Fratalocchi, A. “Observation of superradiant phase transition in quantum chaos”, Conference on Lasers and Electro-Optics Europe - Technical Digest, 2014-January, art. no. 6988857.
82. Totero Gongora, J.S., Coluccio, M.L., Zaccaria, R.P., Di Fabrizio, E.M., Fratalocchi, A. “Superfocusing properties of disorder-enhanced plasmonic nanolenses” Conference on Lasers and Electro-Optics Europe - Technical Digest, 2014-January, art. no. 6989284.
83. Liu, C., Di Falco, A., Krauss, T.F., Fratalocchi, A. “Chaos-assisted, broadband trapping of light”, Conference on Lasers and Electro-Optics Europe - Technical Digest, 2014-January, art. no. 6988288.
84. Trillo, S., Totero, J.S., Fratalocchi, A., “Wave instabilities in nonlinear Schrödinger systems with non vanishing background”, Nonlinear Photonics, NP 2014.
85. Liu, C., Di Falco, A., Krauss, T.F., Fratalocchi, A., “Rogue waves generated through quantum chaos” Conference on Lasers and Electro-Optics Europe and International Quantum Electronics Conference, CLEO/Europe-IQEC 2013, art. no. 6801847.
86. Toth, L.D., Fratalocchi, A., “Light propagation in disordered media: From Maxwell equations to a spherical p-spin model and light condensation effects”, Conference on Lasers and Electro-Optics Europe and International Quantum Electronics Conference, CLEO/Europe-IQEC 2013, art. no. 6801459.
87. Brambila, D., Fratalocchi, A., ”Quantum-classical correspondence in multimensional nonlinear

systems: Anderson localization and "superdiffusive" solitons" Access Networks and In-house Communications, ANIC 2012.

88. Brambila, D., Fratalocchi, A., "Quantum-classical correspondence in multimensional nonlinear systems: Anderson localization and "superdiffusive" solitons", Integrated Photonics Research, Silicon and Nanophotonics, IPRSN 2012.

Publications before joining KAUST

1. S. Gentilini, A. Fratalocchi, and C. Conti. Signatures of anderson localization excited by an optical frequency comb. Physical Review B , 81(1), 2010.
2. S. Gentilini, A. Fratalocchi, L. Angelani, G. Ruocco, and C. Conti. Ultrashort pulse propagation and the anderson localization. Optics Letters , 34(2):130-132, 2009.
3. Claudio Conti, Andrea Fratalocchi, Marco Peccianti, Giancarlo Ruocco, and Stefano Trillo. Observation of a gradient catastrophe generating solitons. Physical Review Letters , 102(8), 2009.
4. Andrea Armaroli, Stefano Trillo, and Andrea Fratalocchi. Suppression of transverse instabilities of dark solitons and their dispersive shock waves. Physical Review A , 80(5), 2009.
5. A. Fratalocchi, C. Conti, G. Ruocco, and S. Trillo. Free-energy transition in a gas of noninteracting nonlinear wave particles. Physical Review Letters , 101(4), 2008.
6. A. Fratalocchi, C. Conti, G. Ruocco, and F. Sette. Nonlinear refraction of hard x rays. Physical Review B , 77(24), 2008.
7. A. Fratalocchi, C. Conti, and G. Ruocco. Three-dimensional ab initio investigation of light-matter interaction in mie lasers. Physical Review A , 78(1), 2008.
8. A. Fratalocchi, C. Conti, and G. Ruocco. Mode competitions and dynamical frequency pulling in mie nanolasers: 3d ab-initio maxwell-bloch computations. Optics Express , 16(12):8342-8349, 2008.
9. C. Conti, M. Leonetti, A. Fratalocchi, L. Angelani, and G. Ruocco. Condensation in disordered lasers: Theory, 3d+1 simulations, and experiments. Physical Review Letters , 101(14), 2008.
10. C. Conti, A. Fratalocchi, G. Ruocco, and F. Sette. Nonlinear optics in the x-ray regime: nonlinear waves and self-action e_ects. Optics Express , 16(12):8324-8331, 2008.
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14. Andrea Fratalocchi, Armando Piccardi, Marco Peccianti, and Gaetano Assanto. Nonlinear management of the angular momentum of soliton clusters: Theory and experiment. Physical Review A , 75(6), 2007.
15. Andrea Fratalocchi and Gaetano Assanto. Universal character of the discrete nonlinear schrodinger equation. Physical Review A , 76(4), 2007.
16. Andrea Fratalocchi and Gaetano Assanto. Symmetry-breaking instabilities in perturbed optical lattices: Nonlinear nonreciprocity and macroscopic self-trapping. Physical Review A , 75(6), 2007.
17. Andrea Fratalocchi and Gaetano Assanto. Nonlinear adiabatic evolution and emission of coherent bloch waves in optical lattices. Physical Review A , 75(1), 2007.
18. A. Fratalocchi, K. A. Rutkowska, M. A. Karpierz, and G. Assanto. Light induced angular steering via floquet-bloch band-tunnelling in one-dimensional liquid crystalline photonic lattices. Opto-Electronics Review , 15(4):210-214, 2007.
19. G. Assanto, A. Fratalocchi, and M. Peccianti. Spatial solitons in nematic liquid crystals: from bulk to discrete. Optics Express , 15(8):5248-5259, 2007.

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21. Andrea Fratalocchi and Gaetano Assanto. Light propagation through a nonlinear defect: symmetry breaking and controlled soliton emission. Optics Letters , 31(10):1489-1491, 2006.
22. Andrea Fratalocchi and Gaetano Assanto. Dispersion spectroscopy of photonic lattices. Optics Letters , 31(22):3351-3353, 2006.
23. A. Fratalocchi, G. Assanto, K. A. Brzdakiewicz, and M. A. Karpierz. Optically induced zener tunneling in one-dimensional lattices. Optics Letters , 31(6):790-792, 2006.
24. A. Fratalocchi and G. Assanto. Governing soliton splitting in one-dimensional lattices. Physical Review E , 73(4), 2006. 2.
25. A. Fratalocchi and G. Assanto. All-optical landau-zener tunneling in waveguide arrays. Optics Express , 14(5):2021-2026, 2006.
26. A. Fratalocchi, G. Assanto, K. A. Brzdakiewicz, and M. A. Karpierz. Optical multiband vector breathers in tunable waveguide arrays. Optics Letters , 30(2):174-176, 2005.
27. A. Fratalocchi, G. Assanto, K. A. Brzdakiewicz, and M. A. Karpierz. Discrete light propagation and self-trapping in liquid crystals. Optics Express , 13(6):1808-1815, 2005.
28. A. Fratalocchi, G. Assanto, K. A. Brzdakiewicz, and M. A. Karpierz. All-optical switching and beam steering in tunable waveguide arrays. Applied Physics Letters , 86(5), 2005.
29. A. Fratalocchi and G. Assanto. Optical switching in a liquid crystalline waveguide. Proceedings of Wfopc 2005: 4th Ieee/Leos Workshop on Fibres and Optical Passive Components , pages 271-274, 2005.
30. A. Fratalocchi and G. Assanto. Discrete light localization in one-dimensional nonlinear lattices with arbitrary nonlocality. Physical Review E , 72(6), 2005. 2.
31. A. Fratalocchi and G. Assanto. All-optical switching in a liquid crystalline waveguide. Applied Physics Letters , 86(5), 2005.
32. A. Fratalocchi, R. Asquini, and G. Assanto. Integrated electro-optic switch in liquid crystals. Optics Express , 13(1):32{37, 2005.
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37. A. Fratalocchi, M. Peccianti, C. Conti, and G. Assanto. Spiraling and cyclic dynamics of nematicons. Molecular Crystals and Liquid Crystals , 421:197-207, 2004. 10th International Topical Meeting on Optics of Liquid Crystals SEP 13-19, 2003 Aussois, FRANCE.
38. A. Fratalocchi, K. Brzdakiewicz, M. Karpierz, G. Assanto, and ieee. Discrete spatial solitons, breathers and steering in liquid crystal waveguide arrays. 2004 Ieee Leos Annual Meeting Conference Proceedings, Vols 1 and 2 , pages 839-840, 2004.
39. A. Fratalocchi, G. Assanto, K. A. Brzdakiewicz, and M. A. Karpierz. Discrete propagation and spatial solitons in nematic liquid crystals. Optics Letters , 29(13):1530-1532, 2004.
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RESEARCH FUNDS

1. Ultra-Flat Light Processing Technology via Nanoscale Neural Networks, Funding Agency: KAUST Impact Accelerator Fund (IAF), Principal Investigator: Andrea Fratalocchi, 1 dec 2021-30 Nov 2022, Awarded 100K USD, My portion 100K USD.
2. HOCULUS: Artificial intelligence assisted hyperspectral imaging via complex metasurface projectors, Principal Investigator; Andrea Fratalocchi, Co-Investigator: Bernard Ghanem, Funding Agency: KAUST Artificial-Intelligence (AI) Initiative, Awarded 50K USD, my portion 50K USD,
3. Multi-functional Solar Water Desalination, Funding Agency: PERA COMPLEXITY (R&D Company in EU). Principal Investigator: Andrea Fratalocchi, Co-Investigator: C. Aegert (University of Zurich). 2019-2020, Awarded 100K USD, my portion 30K USD
4. Photonics of Chiral Nanostructures. Funding Agency: KAUST Office of Sponsored Research, Competitive Research Grant. Principal Investigator: Andrea Fratalocchi; Co-Investigator: F. Capasso (Harvard Univesity, USA). 1 Apr 2017 - 31 March 2020. (Awarded 1.05M USD, 3 years, my portion 630000 USD).
5. Multipurpose nano spectroscopies with spatial and temporal control through adiabatic compression and localization of surface plasmon polaritons. Funding Agency: KAUST Office of Sponsored Research, Competitive Research Grant. Principal Investigator: Enzo di Fabrizio; Co-Investigators: A. Fratalocchi, Matthias F. Kling (Ludwig Maximilians Universität München (LMU), Germany). 1-March-2015/28-Feb-2018 (Awarded $1.5M, my portion 200000 USD).
6. Optics and Plasmonics for efficient energy harvesting. Funding Agency: KAUST Office of Sponsored Research, Competitive Research Grant. Principal Investigator: Andrea Fratalocchi; Co-Investigators: Osman Bakr, Federico Capasso (Harvard University, USA). 1-Sep-2012/31-Aug-2015 (Awarded $1.5M, my portion 350000 USD).
7. Dispersive shock waves in complex systems. Funding Agency: Italian Government Projects of Research of National Interest (PRIN) project No. 2009P3K72Z. Principal Investigator: Stefano Trillo (Ferrara University, Italy); Co-Investigators: A. Fratalocchi, F. Baronio (Brescia University, Italy), C. Conti (Sapienza University, Italy). 2011-2013 (Awarded $350K).

RESEARCH SUPERVISED

Supervision at KAUST		
Primary Supervision - Masters	**Primary Supervision – PhD**	**Post Doc Supervision**
Completed: 10 In Progress: 0	Completed: 5 In Progress: 6	Total: 3

King Abdullah University of Science and Technology

PhD: Advisor

1) C. Liu, CEMSE; Light-Matter interactions in complex nanophotonics systems (Start date 2012; Graduated: May 2016)
   Positions after graduation:
   a) Research Fellow at Metamaterial Center (Prof. Shuang Zhang), Birmingham University, UK
   b) Humboldt Research Fellow at LMU (Prof. Stefan Maier), Munich, Germany

c) Presently Lecturer at University of Exter

2) J. S. T. Gongora, CEMSE; Complex quantum nanolasers (Start date 2013; Graduated: Apr 2017).
Positions after graduation:
a) Research Fellow at Sussex University (UK)
b) Helena Normaton Fellow at Sussex University (UK)
c) Leverhulme Early Career Fellow at Sussex University (UK)
d) Engineering and Physical Sciences Research Council (EPSRC) Award (UK)
e) Presently Senior Lecturer at Loughborough University (UK)

3) M. Bonifazi, CEMSE; complex metamaterials (start date 2013; graduated: 2018).
Positions after graduation:
a) Post-Doctoral Researcher at University of Zurich (Switzerland)
b) UZH Fellow at University of Zurich (Switzerland)
c) Currently received an offer for a Scientist position at Hitachi Energy (Switzerland)

4) Y. Tian, CEMSE; complex energy harvesting (start date 2013; graduated: 2018).
Positions after graduation:
a) Research Fellow at University of Sussex (UK)

5) V. Mazzone, CEMSE; perfect secrecy security with complex systems (start date 2013; graduated: 2018).
Positions after graduation:
a) Post-Doctoral Researcher at University of Zurich (Switzerland)
b) InnoSwiss Grant Award at UZH (Switzerland)

6) M. Elizarov, Physical Sciences and Engineering (PSE); started 2020.

7) M. Makarenko, CEMSE, started 2018.

8) F. Getman, CEMSE, started 2018.

9) A. Lopez, CEMSE, started 2020.

10) F. Xiang, CEMSE, started 2021.

11) Q. Wang, CEMSE, started 2021.

MS: Advisor

1) Barbara Oliveira, CEMSE; Refractive index mapping of biological cells via complex metamaterials (Start date 2019, graduated 2021),
Positions after graduation:
Research Scientist at Silicon Austria Labs (Austria)
2) Fei Xiang, CEMSE; Energy harvesting with complex systems (Start date: 2019, graduated 2021).
Positions after graduation:
PhD at KAUST
3) Redha Al Ibraim, CEMSE; Complex metamaterials for nanoprinting (start date 2018, graduated 2020).
Positions after graduation:

PhD at KAUST

4) Andris Erglis, CEMSE; Light localization in complex systems (start date 2016, graduated 2018).
   Positions after graduation:
   PhD at CERN.
5) L. D. Toth, CEMSE; Light condensation and localization in disordered photonic media: theory and large scale ab initio simulations (Start date: 2011; Graduated: 2013).
   Positions after graduation:
   PhD at EPFL (Switzerland).
6) E. D. Morales, CEMSE; Strong Localization in Disordered Media: Analysis of the Backscattering Cone (Start date: 2010; Graduated: 2012).
   Positions after graduation:
   PhD at EPFL (Switzerland).
7) A. M. V. Faez, CEMSE; Omnidirectional Photonic Band Gap Using Low Refractive Index Contrast Materials and its Application in Optical Waveguides. (Start date: 2010; Graduated: 2012).
   Positions after graduation:
   Saudi ARAMCO (Saudi Arabia).
8) D. Brambila, CEMSE; Quantum-Classical correspondence in nonlinear multidimensional systems: enhanced diffusion through soliton wave-particles (Start date: 2010; Graduated: 2012).
   Positions after graduation:
   PhD at Max-Borne Institute (Germany).
9) Yi Tian, CEMSE; Infrared absorbing solar cells based on disordered epsilon near to zero nano materials (Start date: 2013; Graduated: 2015).
   Positions after graduation:
   PhD at KAUST.
10) D. di Stefano, Dept. of Physics; Nonlinear imaging at the angstrom scale with XFEL sources. (Start date: 2009; Graduated: 2011).
    Positions after graduation:
    PhD at Fraunhofer Institute (Germany).

Postdoc supervised

1) Gael Favraud (Start date: 2013, departure date: 2018, PhD from Ecole Polytechnique, Paris, France)
   Positions after KAUST:
   a) Research fellow at Harvard University, US
2) Ning Li (Start date: 2018, end 2022, PhD from Jilin University, China 2017)
   now promoted Research Scientist at KAUST, starting 2022.
3) Zhao He (start date 2022, PhD from Key Laboratory of Carbon Materials, Institute of Coal Chemistry, Chinese Academy of Sciences in 2021)

UNIVERSITY SERVICE AND OUTREACH

Electric and Computer Engineering University Committees

1) 2012-2015, 2017-2018, Admission Committee
2) 2018-2020, Curriculum Committee [Chair]
3) 2021-2022, Qualifier Exam Committee [Chair]
4) 2016, Faculty Search Committee

CEMSE Division University Committees

1) 2019-2022, Student Recruiting Committee [Chair]

Outreach

PROFESSIONAL SERVICE

Evaluator expert for:

1) the European Commission for ERC Grants
2) the Velux Stiftung Science Foundation (Switzerland)
3) the Marie-Sklodowska-Curie Fellowships of the European Union Framework Programmes.
4) the Project Agency at the German Aerospace Center (DLR).

Editorial service:

1) Editor of Scientific Reports, Nature Publishing Group

Conference Organization:

5) Organizing Committee FS6 CLEO/QELS US (2020, 2021, 2022)

REVIEWER FOR JOURNALS

1) Science/Science Advances
2) Nature/Nature Photonics/Nature Comm/Nature Physics
3) Advanced Materials/Advanced Optical Materials/Advanced Sustainable Systems
4) Physical Review Letters/X/A/B/E
5) ACS Photonics
6) Optics Letters/Optics Express
7) Journal of Optics A/B
8) Europhysics Letters
9) Joule
10) Nanoenergy
11) Laser and Photonics Review