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EDUCATION

- Ph.D. Physics, *Massachusetts Institute of Technology* (09/2008 – 08/2014)
B.S. Academic Talent Program, Mathematics and Physics, (ranked 2/55)
Tsinghua University, Beijing, China (09/2004 – 08/2008)

APPOINTMENTS

- Assistant Professor, Department of Physics, *University of Pennsylvania* (Jan 2018 –)
Elliman Faculty Fellow, Vagelos Institute for Energy Science and Technology, *University of Pennsylvania* (Jan 2018 –)
Joint Postdoc, Prof. Marin Soljačić group, Physics Department, *MIT* (09/2014 – 12/2017)
Joint Postdoc, Prof. Mordechai Segev group, Physics Department, *Technion* (09/2014 – 12/2017)
Graduate Student, Prof. Marin Soljačić group, Physics Department, *MIT* (01/2010 – 08/2014)
Graduate Student, Prof. Eric Hudson group, Physics Department, *MIT* (08/2008 – 01/2010)

HONORS AND AWARDS

- AFOSR Young Investigator Program Award (2018)
Finalist, Carl E. Anderson Award for Outstanding Doctoral Dissertation in Laser Science, American Physical Society (2015)
MIT, Presidential Fellowship (09/2008 – 09/2009)
Tsinghua University, National Scholarships (09/2005 – 09/2007)
Tsinghua University, Outstanding Freshman Scholarship (09/2004)

PEER-REVIEWED PUBLICATIONS

(* equal contribution † corresponding author)

- “Observation of bulk Fermi arc and polarization half charge from paired exceptional points“, H. Zhou*, C. Peng*, Y. Yoon, C. W. Hsu, K. A. Nelson, L. Fu, J. D. Joannopoulos, M. Soljačić, B. Zhen†, *Science* (in-press, 2018).
- “General theory of spontaneous emission at exceptional points” A. Pick*, B. Zhen*, O. D. Miller, C. W. Hsu, F. Hernandez, A. W. Rodriguez, O. D. Miller, M. Soljačić, and S. G. Johnson, *Optics Express* 25, 11, 12325 (2017). **Editor’s Pick**
- “Topologically-enabled optical nano-motors” O. Ilic, I. Kaminer, B. Zhen, O. Miller, H. Buljan, and M. Soljačić, *Science Advances*, 3, 6, e1602738 (2017).
- “Dynamically encircling exceptional points: exact evolution and polarization state conversion” A. U. Hassan, B. Zhen, M. Soljačić, M. Khajavikhan, and D. Christodoulides, *Physical Review Letters*, 118, 093002 (2017).
- “Symmetry, stability, and computation of degenerate lasing modes.” D. Liu, B. Zhen, L. Ge, F. Hernandez, A. Pick, S. Burkhardt, M. Liertzer, S. Rotter, and S. G. Johnson, *Physical Review A*, 95, 023835 (2017).
- “Spectrally and Spatially Resolved Smith-Purcell Radiation in Plasmonic Crystals with Short-Range Disorder” I. Kaminer, S. E. Kooi, R. Shiloh, B. Zhen, Y. Shen, J. J. López, R. Remez, S. A. Skirlo, Y. Yang, J. D. Joannopoulos, A. Arie, and M. Soljačić, *Physical Review X*, 7, 011003 (2017).
- “Direct imaging of isofrequency contours in photonic structures” E. C. Regan*, Y. Igarashi*, B. Zhen*†, I. Kaminer, C. W. Hsu, Y. Shen, J.D. Joannopoulos, and M. Soljačić, *Science Advances*, 2, 1601591 (2016).

8. “Perfect single-sided radiation and absorption without mirrors” H. Zhou, B. Zhen[†], C. W. Hsu, O. D. Miller, S. G. Johnson, J. D. Joannopoulos, and M. Soljačić, *Optica*, 3, 10, 1079-1086 (2016).
9. “Bound states in the continuum” C.W. Hsu*, B. Zhen*, A.D. Stone, J.D. Joannopoulos, and M. Soljačić, **Invited review at *Nature Review Material***, 1, 16048 (2016).
10. “Shrinking light to allow forbidden transitions on the atomic scale”, N. Rivera*, I. Kaminer*, B. Zhen, J. D. Joannopoulos, and M. Soljačić, *Science*, 353 (6296), 263-269 (2016).
11. “Electromagnetic pathway: flexible yet robust”, B. Zhen and M. Soljačić, *Nature Materials, Views and News*, 15, 494-495 (2016).
12. “Optically thin metallic films for high-radiative-efficiency plasmonics”, Y. Yang, B. Zhen, C. W. Hsu, O. D. Miller, J. D. Joannopoulos, and M. Soljačić, *Nano Letters*, 16, 4110-4117 (2016).
13. “Substrate-independent light confinement in bioinspired all-dielectric surface resonators”, E. Regan, Y. Shen, J. Lopez, C. W. Hsu, B. Zhen, J. D. Joannopoulos, and M. Soljačić, *ACS Photonics*, 3, 352-356 (2016).
14. “Controlling directionality and dimensionality of wave propagation through separable bound states in the continuum” N. Rivera, C.W. Hsu, B. Zhen, H. Buljan, J. D. Joannopoulos, and M. Soljačić, *Scientific Report*, 6, 33394 (2016).
15. “Formation Mechanism of Guided Resonance and Bound States in the Continuum in Photonic Crystal Slabs”, X. Gao*, C. W. Hsu*, B. Zhen, L. Xiao, J. D. Joannopoulos, and M. Soljačić, *Scientific Report*, 6, 31908 (2016).
16. “Spawning Rings of Exceptional Points out of Dirac Cones”, B. Zhen*, C.W. Hsu*, Y. Igarashi*, L. Ling, I. Kaminer, A. Pick, S.-L. Chua, J. D. Joannopoulos, and M. Soljačić, *Nature*, 525, 354, (2015).
17. “Topological nature of optical bound states in the continuum” B. Zhen*, C. W. Hsu*, L. Ling, A. D. Stone, and M. Soljačić, *Physical Review Letters* 113, 257401 (2014).
18. “Fabricating Centimeter-scale High Quality Factor 2D-periodic Photonic Crystal Slabs” J. Lee, B. Zhen, S.-L. Chua, O. Shapira, and M. Soljačić, *Optics Express* 22, 3724 (2014).
19. “Modeling of threshold and dynamics behavior of organic Nanostructured lasers.” S.-L. Chua, B. Zhen, J. Lee, J. Bravo, E. Ippen, O. Shapira, and M. Soljačić, **Invited article in *Journal of Material Chemistry C*** 2, 1463 (2014).
20. “Transparent Displays Enabled by Resonant Nanoparticle Scattering”, C. W. Hsu, B. Zhen, W. Qiu, O. Shapira, B. G. Delacy, J. D. Joannopoulos, and M. Soljačić, *Nature Communications* 7, 3152 (2014).
21. “Enabling Enhanced Emission and Low-Threshold Lasing of Organic Molecules Using Special Fano Resonances of Macroscopic Photonic Crystals”, B. Zhen*, S.-L. Chua*, J. Lee, A. W. Rodriguez, X. Laing, S. G. Johnson, J. D. Joannopoulos, M. Soljačić, and O. Shapira, *Proceedings of the National Academy of Sciences* 110 (34) 13711-13716 (2013). [**Featured on the cover**]
22. “Observation of Trapped Light within the Radiation Continuum” C. W. Hsu*, B. Zhen*, J. Lee, S.-L. Chua, S. G. Johnson, J. D. Joannopoulos, and M. Soljačić, *Nature* 499 (7457), 188-191 (2013)
23. “Bloch Surface Eigenstates within the Radiation Continuum” C. W. Hsu, B. Zhen, S.-L. Chua, S. G. Johnson, J. D. Joannopoulos, and M. Soljačić, **Invited Article in *Light: Science & Applications*** 2(7), 84 (2013).

24. “Topological Dangling Bonds with Large Spin Splitting and Enhanced Spin Polarization on the Surface of Bi₂Te₃,” H. Lin, T. Das, Y. Okada, M. C. Boyer, W. D. Wise, M. Tomasik, B. Zhen, E. W. Hudson, W. Zhou, V. Madhavan, C. Ren, H. Ikuta, and A. Bansil, *Nano Letters* 13(5), 1915-1919 (2013).
25. “Observation and Differentiation of Unique High-Q Optical Resonances Near Zero Wave Vector in Macroscopic Photonic Crystal Slabs.” J. Lee*, B. Zhen*, S.-L. Chua*, W. Qiu, J. D. Joannopoulos, M. Soljačić, and O. Shapira, *Phys. Rev. Lett.* 109(6), 067401 (2012).

UNDER REVIEW

1. “Topological band theory for non-Hermitian Hamiltonians“, H. Shen, B. Zhen, L. Fu, arxiv 1706.07435.
2. “Bound states in the continuum in low contrast fiber Bragg gratings“, X. Gao*, C. W. Hsu*, B. Zhen, M. Soljacic, H. Chen, arxiv 1707.01247.
3. “Polarization state of radiation from a photonic crystal slab“, C. W. Hsu, B. Zhen, M. Soljacic, A. D. Stone, arxiv 1708.02197.

SELECTED NEWS COVERAGE

1. “Exceptional crystals” *MIT News, front page* (01/12/2018).
2. “Tiny motors are driven by light” *MIT News* (01/30/2017).
3. “Study opens new realms of light-matter interaction” *MIT News* (07/14/2016)
4. “How to Spawn an ‘Exceptional Ring?’” *DOE, Office of Science, front page* (09/14/2015).
5. “How to Spawn an ‘Exceptional Ring?’” *MIT News* (09/09/2015).
6. “Trapped Light Research Reveals ‘Twister’ Behavior”, *Optics and Photonics News*, November Issue 2014.
7. “Trapping Light with a Twister”, *MIT News, front page* (12/22/2014).
8. “Stick-on Screens Open Up a New Vista for Window Projections”, *BBC News* (01/21/2014).
9. “A Transparent Display without Limits”, *ABC News* (01/31/2014).
10. “Plasmons on Screen”, *Nature Materials*, February Issue 2014.
11. “Turning Your Windows into Movie Screens”, *Science/AAAS* (01/21/2014).
12. “Trapping the Light Fantastic”, *Nature* (07/11/2013).
13. “Quantum Physics Leads to Perfect Mirror”, *Scientific American* (07/24//2013).
14. “A Photonic Crystal Sets a Peculiar Trap”, *Physics Today*, September Issue 2013.
15. “A New Way to Trap Light”, *MIT News, front page* (07/11/2013).

PATENTS

1. “Methods and apparatus for transparent display using up-converting nanoparticles”, U.S. Patent number 9,458,989, issued 10/2016; W.O. Patent pending.
2. “Methods and apparatus for transparent display using scattering nanoparticles”, U.S. Patent number 9,335,027, granted 05/2016; W.O. Patent pending.
3. “Excitation enhancement and extraction enhancement with photonic crystals”, U.S. Patent number 8,969,831, issued 03/2015.
4. “Continuous-wave organic dye lasers and methods”, U.S. Patent number 8,837,550, issued 09/2014.

PRESENTATIONS (CONFERENCES, SEMINARS, AND COLLOQUIA)

1. [Invited] “Non-Hermitian topological photonics”, workshop on “Photonic Topological Insulators”, *Banff International Research Station* (09/2017).
2. [Colloquium] “Topological properties of novel resonant states in nanophotonics”, Department of Physics, *University of Washington* (04/2017).
3. [University Seminar] “Nanophotonics in systems of large sizes”, Department of ECEE, *University of Colorado, Boulder, CO* (03/2017).
4. [University Seminar] “Nanophotonics in systems of large sizes”, Department of Electrical Engineering, *University of Washington* (03/2017).
5. [University Seminar] “Nanophotonics in systems of large sizes”, Department of Electrical and Computer Engineering, *UCSD, CA* (02/2017).
6. [University Seminar] “Nanophotonics in systems of large sizes”, Department of Physics, *University of Pennsylvania, PA* (02/2017).
7. [University Seminar] “Nanophotonics in systems of large sizes”, Department of Electrical and System Engineering, *Washington University at St. Louis, MO* (02/2017).
8. [University Seminar] “Nanophotonics in systems of large sizes”, Department of Electrical Engineering, *Penn. State University, PA* (01/2017).
9. [University Seminar] “Nanophotonics in systems of large sizes”, Department of Physics, *Virginia Tech, VA* (01/2017).
10. [University Seminar] “Nanophotonics in systems of large sizes”, Institute of Optics, *University of Rochester, NY* (01/2017).
11. [University Seminar] “Topological properties of exotic resonances in large-size nanophotonic systems”, Department of Physics, *University of Notre Dame, IN* (12/2016).
12. [Invited] “Topological theory of disallowed couplings”, *Frontier in Optics/Laser Sciences*, Rochester, NY (10/2016).
13. “High-Purcell high-quantum-yield gap-plasmon spontaneous emission enhancement based on optically thin metallic substrates”, *CLEO*, San Jose, CA (06/2016).
14. “Spawning rings of exceptional points out of Dirac cones”, *CLEO*, San Jose, CA (06/2016).
15. [University seminar] “Nanophotonics in systems of large sizes” *CREOL, University of Central Florida* (03/2016).
16. [Invited] “Topological nature of exotic resonances in nanophotonic systems of large sizes.” *Physics of Quantum Electronics*, Snowbird, UT (01/2016).
17. [Invited] “Spawning rings of exceptional points out of Dirac cones” *Frontier in Optics/Laser Sciences*, San Jose, CA (10/2015).
18. [University seminar] “Nanophotonics in systems of large sizes” *Pennsylvania State University* CAMP Seminar (10/2015).
19. [Special symposium] “Topological nature of bound states in the continuum and their applications in generating high-order vector beams”, *CLEO*, San Jose, CA (05/2015).
20. [Post-deadline] “Topological nature of bound states in the continuum”, *Frontier in Optics/Laser Sciences*, Tucson, AZ (10/2014).
21. “Enabling enhanced emission and low-threshold lasing of organic molecules using special Fano resonances of macroscopic photonic crystals”, *CLEO*, San Jose, CA (06/2014).

PROFESSIONAL ACTIVITIES

1. Subcommittee chair, *Frontier in Optics/Laser Sciences* (2016).
2. Reviewer for professorship application at Swiss National Science Foundation.

3. Referee for Science, Nature, Nature Materials, Nature Photonics, Nature Physics, Nature Communications, Scientific Reports, Advanced Materials, Advanced Optical Materials, Laser & Photonics Reviews, Physical Review X, Physical Review Letters, Physical Review A, Physical Review B, Optica, Optics Letters, Optics Express, Journal of the Optical Society of America B, Applied Optics, and Chemical Reviews,.
4. Presider for the session of “Nanophotonics I” at *Frontier in Optics*, Rochester, NY (10/2016). Presider for the session of “Electroplasmonics and optomechanics”, *CLEO*, San Jose, CA (06/2016). Presider for the session of “Semiconductor Nano-optics I” at *Frontier in Optics*, San Jose, CA (10/2015).

TEACHING EXPERIENCE

1. Physics 141/151, Electricity and Magnetism, University of Pennsylvania (Spring 2018)
2. Teaching assistant, Junior Labs (8.013), Physics Department, MIT (Fall 2009)

SUPERVISED STUDENTS

1. Saranesh Prembabu (06/2016 – 06/2017).
2. Sydney Gibson (06/2016 – 01/2017).
3. Hengyun Zhou (08/2015 – 08/2016).
4. Emma C. Regan (03/2015 – 08/2016).
5. Nicholas H. Rivera (10/2013 – 08/2016).
6. Imbert Wang (10/2013 – 07/2014).
7. Prashanth Venkataram (03/2013 – 06/2014).
8. Kevin Soedyatmiko (09/2012 – 06/2013).