Josué J. López

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Cambridge MA, 02139

Areas of Research

nanophotonics, photonic integrated circuits, heads-up displays, plasmonics, metamaterials, 2D materials

Education

Massachusetts Institute of Technology, Cambridge, MA — Expected 2020
PhD in Electrical Engineering & Computer Science
Concentration: Applied Physics & Devices
Minor: Business & Entrepreneurship
Advisor: Prof. Marin Soljačić

Massachusetts Institute of Technology, Cambridge, MA — 06/2017
Master of Science in Electrical Engineering & Computer Science

Rice University, Houston, TX — 05/2014
Bachelor of Science in Physics
Distinction in Research

Select Research Fellowships

Activate Entrepreneurial Research Fellow	2020
Facebook Fellowship (AR/VR Photonics and Optics)	2019
Alfred P. Sloan Foundation Graduate Scholarship	2017
National GEM Consortium Fellowship	2017
National Science Foundation Graduate Research Fellowship	2014
MIT Lemelson Presidential Graduate Fellowship	2014

Prior Research Experience

Rice University, Physics & Astronomy — 09/2011–05/2014
Undergraduate Researcher, Advisor: Prof. Jason H. Hafner

California Institute of Technology, Applied Physics & Material Science — 06/2012–08/2013
Summer Researcher, Advisor: Prof. Harry A. Atwater Jr.

Northwestern University, Material Science & Engineering — 06/2010–08/2011
Summer Researcher, Advisor: Prof. Mark C. Hersam

California Institute of Technology, Applied Physics & Material Science — 06/2008–08/2009
Summer Researcher, Advisor: Prof. Julia R. Greer

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Publications (Google Scholar Citations > 1200, h-index = 11)

(14) **López, J. J.** et al. On-Chip Photonic Crystal Luneburg Lens for Wide Field-of-View LIDAR, *In Preparation*
(13) **López, J. J.** et al. Planar-lens Enabled Beam Steering for Chip-scale LIDAR, *In Preparation*

(12) **López, J. J.**; Ambrosio, A.; Dai, S.; Huynh, C.; Bell, D. C.; Lin, X.; Rivera, N.; Huang, S.; Ma, Q.; Eyhusen, S.; et al. Large Photothermal Effect in Sub-40 Nm H-BN Nanostructures Patterned Via High-Resolution Ion Beam. *Small* **2018**, *14* (22).
(11) Qian, C.; Lin, X.; Yang, Y.; Gao, F.; Shen, Y.; **López, J. J.**; Kaminer, I.; Zhang, B.; Li, E.; Soljačić, M.; et al. Multifrequency Superscattering from Subwavelength Hyperbolic Structures. *ACS Photonics* **2018**, *5* (4), 1506–1511.
(10) Lin, X.; Yang, Y.; Rivera, N.; **López, J. J.**; Shen, Y.; Kaminer, I.; Chen, H.; Zhang, B.; Joannopoulos, J. D.; Soljačić, M. All-Angle Negative Refraction of Highly Squeezed Plasmon and Phonon Polaritons in Graphene–boron Nitride Heterostructures. *Proc. Natl. Acad. Sci.* **2017**, *114* (26), 6717–6721.
(9) Kaminer, I.; Kooi, S. E.; Shiloh, R.; Zhen, B.; Shen, Y.; **López, J. J.**; Remez, R.; Skirlo, S. A.; Yang, Y.; Joannopoulos, J. D.; et al. Spectrally and Spatially Resolved Smith-Purcell Radiation in Plasmonic Crystals with Short-Range Disorder. *Phys. Rev. X* **2017**, *7* (1), 11003.
(8) Lin, X.; Rivera, N.; **López, J. J.**; Kaminer, I.; Chen, H.; Soljačić, M. Tailoring the Energy Distribution and Loss of 2D Plasmons. *New J. Phys.* **2016**, *18* (10), 105007.
(7) Kaminer, I.; Katan, Y. T.; Buljan, H.; Shen, Y.; Ilic, O.; **López, J. J.**; Wong, L. J.; Joannopoulos, J. D.; Soljačić, M. Efficient Plasmonic Emission by the Quantum Cerenkov Effect from Hot Carriers in Graphene. *Nat. Commun.* **2016**, *7*.
(6) Regan, E. C.; Shen, Y.; **López, J. J.**; Hsu, C. W.; Zhen, B.; Joannopoulos, J. D.; Soljacic, M. Substrate-Independent Light Confinement in Bioinspired All-Dielectric Surface Resonantors. *ACS Photonics* **2016**.
(5) Brar, V. W.; Jang, M. S.; Sherrott, M.; Kim, S.; **López, J. J.**; Kim, L. B.; Choi, M.; Atwater, H. Hybrid Surface-Phonon-Plasmon Polariton Modes in Graphene/Monolayer H-BN Heterostructures. *Nano Lett.* **2014**, *14* (7), 3876–3880.
(4) Jang, M. S.; Brar, V. W.; Sherrott, M. C.; **López, J. J.**; Kim, L.; Kim, S.; Choi, M.; Atwater, H. A. Tunable Large Resonant Absorption in a Midinfrared Graphene Salisbury Screen. *Phys. Rev. B* **2014**, *90* (16), 165409.
(3) Brar, V. W.; Jang, M. S.; Sherrott, M.; **López, J. J.**; Atwater, H. A. Highly Confined Tunable Mid-Infrared Plasmonics in Graphene Nanoresonators. *Nano Lett.* **2013**, *13* (6), 2541–2547.
(2) Shastry, T. A.; Seo, J.-W. T.; **López, J. J.**; Arnold, H. N.; Kelter, J. Z.; Sangwan, V. K.; Lauhon, L. J.; Marks, T. J.; Hersam, M. C. Large-Area, Electronically Monodisperse, Aligned Single-Walled Carbon Nanotube Thin Films Fabricated by Evaporation-Driven Self-Assembly. *Small* **2013**, *9* (1), 45–51.
(1) **López, J. J.**; Greer, F.; Greer, J. R. Enhanced Resistance of Single-Layer Graphene to Ion Bombardment. *J. Appl. Phys.* **2010**, *107* (10), 104326.

Invited Presentations

"Novel photonics for optical beam steering and novel 3D fabrication toward complex metamaterials," *Division of Physics and Applied Physics*, Nanyang Technological University, July 2019, Singapore

"Planar-lens Enabled Beam Steering for Chip-scale LIDAR," *Conference on Lasers and Electro-Optics (CLEO)*, May 2018, San Jose, CA

"High-Resolution Ion Beam Patterning of 2D Materials," *MIT Lincoln Laboratory HLN Technical Seminar*, August 2016, Lexington, MA

"High-Resolution Ion Beam Patterning of 2D Materials," *New England Society for Microscopy Fall Meeting*, October 2016, Peabody, MA

Contributed Presentations

"All-dielectric Materials Integration for Planar-lens-based Optical Beam Steering," *MRS Fall Meeting*, November 2018, Boston, MA

"Large Photo-Thermal Effect in Sub-40 nm h-BN Nanostructures Measured via SPM," *Optical Scanning Probe Microscopy of 2D Quantum Materials, Harvard University*, October 2018, Cambridge, MA

"Large Photo-Thermal Effect in Sub-40 nm h-BN Nanostructures Patterned via High-Resolution Ion Beam," *APS March Meeting,* March 2018, Los Angeles, CA

Journals Refereed

ACS Nano Letters, Optics Express, IEEE Photonics Journal, IEEE Journal of Selected Topics in Quantum Electronics

Academic Honors and Awards (Complete List)

Activate Fellowship (DARPA supported)	2020
Winner, Arizona State University Innovation Open	2020
Facebook Fellowship (AR/VR Photonics and Optics)	2019
1st Place, MIT LL-ISN Solider Design Competition	2019
NextProf Nexus Selectee (UC Berkeley)	2018
Alfred P. Sloan Foundation PhD Scholarship	2017
National GEM Consortium Fellowship	2017
National Science Foundation Graduate Research Fellowship	2014
MIT Lemelson Presidential Graduate Fellowship	2014
Wagoner Foreign Study Scholarship, Rice University	2014
American Physical Society Minority Scholarship	2013
American Physical Society Minority Scholarship	2012
Gordon and Betty Moore Foundation Summer Research Fellowship	2012
Alliance/Merck Ciencia National Scholarship	2012
Mellon Mays Undergraduate Fellowship	2012
Math, Engineering, and Science Achievement Transfer Scholarship, State of California	2010
Kavli Nanoscience Institute Research Scholarship, California Institute of Technology	2009
Kavli Nanoscience Institute Research Scholarship, California Institute of Technology	2008

Mentees

Amel Amin Elfadil, MIT, undergraduate researcher	07/2019–Present
Yong Hui Lim, MIT, undergraduate researcher	09/2019–05/2020
Neil Aggarwal, MIT, undergraduate researcher	04/2016–12/2016
Priya Kikani, MIT, undergraduate researcher	02/2016–05/2016
Chad Auginash, University of Minnesota Duluth, undergraduate researcher	04/2015–08/2016

Service Honors and Awards

MIT Mens et Manus Award	2020
MIT Martin Luther King Jr. Leadership Award	2018
MIT Unsung Hero Award	2017

Select Diversity, Equity, and Inclusion Service

Massachusetts Institute of Technology, Cambridge, MA. 01/2018–Present

Member, MIT Academic Council Working Group

- Lead author of letter to the President and Academic Council on improving institute-wide DEI strategic plan
- Lead author of a memo regarding DEI improvements to the newly formed MIT College of Computing.
- Lead author of a memo regarding improvements to the search process for the MIT Chief Diversity Officer.
- Held one-on-one strategic meetings with the Provost regarding DEI benchmarking and strategic planning.
- Worked with the Vice-President, Vice-Chancellor, General Counsel, Chief Diversity Officer, and Dean for Student Life on institutional strategy regarding DEI initiatives within the Institute.

Rice University, Houston, TX. 08/2012–05/2013

President, Empowering Leadership Alliance

- Fundraised $5900 for a symposium that encouraged underrepresented groups to pursue science.
- Co-organized five sessions that taught 35 undergraduates leadership, research skills, and career planning.
- Analyzed post attendance surveys and co-wrote final report to determine most effective workshops.

Diversity, Equity, and Inclusion Service (Complete List)

MIT Graduate Student Council, *Vice-Chair of Diversity, Equity, Inclusion Committee* 06/2018–07/2019
MIT Academic Council Working Group, *Member* 01/2018–Present
MIT Graduate Students of Color Advisory Council, *Founding Member* 08/2017–Present
MIT Academy of Courageous Minority Engineers, *President* 08/2017–05/2018
MIT Forum on Racial and Environmental Equity and Justice, *Co-Chair of Committee* 12/2016–05/2017
MIT EECS Department Diversity Statement Committee, *Member* 12/2016–Present
MIT Office of Graduation Education, *Diversity Ambassador* 04/2016–Present
MIT Summer Research Program, *Application Reviewer and Mentor* 04/2015–02/2017
Rice University Empowering Leadership Alliance, *Student Board Member* 09/2011–05/2014

Technical and Academic Service

MIT EECS, Visiting Committee, *Graduate Student Panel and Report Writer* 04/2019
MIT Applied Physics Club Colloquium, *Co-Organizer* 09/2016–05/2017
Department of Defense Future Directions Workshop for Power and Energy, *Report Writer* 02/2016–02/2016
Rice University Society of Physics Students, *Co-President* 08/2013–05/2014

Academic and Professional Affiliations

MIT Lincoln Laboratory 2017–Present
MIT Center for Materials Science and Engineering 2015–Present
MIT Institute for Soldier Nanotechnologies 2015–Present
MIT Research Laboratory of Electronics 2015–Present
Materials Research Society 2015–Present
Institute of Electrical and Electronics Engineers 2014–Present
American Chemical Society 2014–Present
American Physical Society 2012–Present