

Joseph L. Ponsetto

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SUMMARY

An energetic, passionate physicist and engineer with proven, vertically-integrated skills and the ability to deliver a product from start to finish. Experienced in full-stack design of photonic systems for optical communication in space and terrestrial applications. Flexible, cooperative, intellectually curious, and a fast learner with the ability to lead by example.

SKILLS

- Hardware design and characterization: free-space and fiber optics, CW and pulsed lasers, optical amplifiers, coherent and IMDD transceivers, navigation systems, accelerometers, gyroscopes, gas sensing, inductive sensing, current sensing, photodiodes, analog front-end design, oscilloscopes, function generators, spectrum analyzers, BERT, DAQ, microscopy
- Programming languages: Python, MATLAB, Android Linux, C++, C, LabVIEW, JavaScript
- Design/simulation software: CST, COMSOL, Zemax, Altium, VPIphotonics, NX, Mathematica
- Cleanroom fabrication: nanoimprint lithography, plasma etching, spin coating, ellipsometry, EBPVD, SEM, FIB, AFM
- Administrative/OS: Windows, Linux, L^AT_EX, Microsoft Office, Google Apps, Adobe Acrobat
- Leadership: public speaking, written and oral communication, fundraising, group organization
- Autodidacticism: web development, computer architecture, amateur radio and electronics
- Language: reading, writing, speaking, and comprehension in English and Spanish

WORK EXPERIENCE

SpaceX; Hawthorne, CA

Sr. Space Lasers Engineer, 2022 - Present

- Designing a state of the art space-based laser communication terminal for Starlink and other ventures, focusing on the fiber amplifier and coherent transceiver
- Successfully introduced the first fully in-house fiber amplifier, owning the technical product and business outcome from conceptualization through prototyping and qualification, to volume production

Space Lasers Engineer, 2019 - 2022

- Responsible for the fiber amplifier design on the company's first-ever inter-satellite laser
- Resolved several inherited hardware reliability problems to ensure mission success

Avionics Test Engineer, 2017 - 2019

- Supported rigorous qualification of new avionics for the world's most advanced rockets and spacecraft
- Designed and implemented robust acceptance test systems for avionics and sensors, responsible for all aspects of test system hardware and software

Electrical Engineering Department, University of California, San Diego; La Jolla, CA

Powell Research Fellow, 2010 - 2016

- Led and published research under Prof. Z. Liu in the areas of super-resolution microscopy, nanophotonics, and plasmonic structures for imaging and lithography applications
- Designed, fabricated, characterized, and successfully implemented a nano-antenna array within a complex optoelectronic system to achieve super-resolution optical imaging
- Developed breadth and depth of interdisciplinary experience in experimental optics, fabrication, sensing, signal processing, reconstruction algorithms, and software prototyping

- Conducted and published research under Prof. S. Radic in the areas of nonlinear fiber optics, optical ADC preprocessing via four-wave mixing, and EDFA transient mitigation
- Designed, built, and tested many optoelectronic tools: complex free-space optics platforms, custom EDFAs, ultrashort pulse characterizers, and frequency comb generators
- Lectured, tutored, graded, and created course material for electrical engineering classes as a graduate teaching assistant

Physics Department, Boston College; Chestnut Hill, MA

Research Assistant, 2008 - 2010

- Conducted and published research under Prof. W. Padilla on the photonic properties of metamaterials

EDUCATION

University of California, San Diego, La Jolla, CA

Ph.D. Applied Physics (ECE); 2016

M.S. Applied Physics (ECE); 2012

Boston College, Chestnut Hill, MA

B.S. Physics, Minors in Mathematics and Hispanic Studies; 2010

Student exchange semester at Pontificia Universidad Católica; Santiago, Chile

TEACHING

- ECE 25: Introduction to Digital Design
- ECE 45: Circuits and Systems
- ECE 101: Linear Systems Fundamentals
- ECE 109: Engineering Probability and Statistics

LEADERSHIP / AWARDS / CERTIFICATIONS

- Invited speaker at Aerospace Corp MRQW, 2021
- Invited keynote speaker at UCSD PhD recruitment event, 2019
- Powell Research Fellow, UCSD, 2010 - 2016
- Vice President of UCSD Departmental Graduate Student Council, 2013 - 2014
- Department Representative to UCSD Graduate Student Association, 2010 - 2015
- Micro-MBA Certificate, UCSD, 2014
- Dean's List, Boston College, 2006 - 2010
- FCC-licensed amateur radio technician (callsign: KM6DDU), 2016 - Present
- PADI-licensed Advanced Open Water Diver, 2016 - Present
- Member IEEE, OSA, SPIE, SPS

SELECTED PUBLICATIONS

- J. L. Ponsetto et al., “*Experimental demonstration of localized plasmonic structured illumination microscopy*”, ACS Nano, Vol. 11, pp. 5344-5350 (2017)
- J. L. Ponsetto and Z. Liu, “*The far-field superlens*” in “*Plasmonics and super resolution imaging*”, Pan Stanford Publishing (2017)
- W. Wan[†], J. L. Ponsetto[†], and Z. Liu, “*Numerical study of hyperlenses for three-dimensional imaging and lithography*”, Opt. Expr., Vol. 23, pp. 18501-18510 (2015) [[†]Equal contribution]
- J. L. Ponsetto, F. Wei, and Z. Liu, “*Localized plasmon assisted structured illumination microscopy*”, Nanoscale, Vol. 6, pp. 5807-5812 (2014)