

Education

Massachusetts Institute of Technology , Department of Earth, Atmospheric and Planetary Sciences Ph.D., Planetary Science GPA: 5.0/5.0. Dissertation: <i>The Formation and Evolution of Planetary Systems</i>	Cambridge, MA 2016
Massachusetts Institute of Technology , Department of Mechanical Engineering S.M., Mechanical Engineering GPA: 5.0/5.0. Thesis: <i>Analysis and Implementation of the Bilayer Microfluidic Geometry</i>	Cambridge, MA 2011
University of Pennsylvania , School of Engineering and Applied Science B.S.E., Mechanical Engineering Magna Cum Laude. Senior Design Projects: <i>Reconnaissance Robot; Envirodyne Filtration Tank Cleaning System</i>	Philadelphia, PA 2008
University of Pennsylvania , The Wharton School, Aresty Institute of Executive Education Certificate in Product Management and Strategy	Philadelphia, PA 2022

Professional Experience: Summary

○ Chief Technology Officer, Santa Barbara Infrared	2025 - present
○ Director and Chief Architect, Terran Orbital—A Lockheed Martin Company	2024 - 2025
○ Senior Manager, EO/IR Systems Engineering, Mission Performance, and Test, Lockheed Martin Space	2022 - 2024
○ Chief System Architect and Associate Director, Raytheon Intelligence & Space	2021 - 2022
○ Senior Principal Systems Engineer, Raytheon Intelligence & Space	2019 - 2021
○ Associate Physical Scientist, RAND Corporation	2018 - 2019
○ Senior Member of Technical Staff, The Aerospace Corporation	2017 - 2018

Professional Experience: Details

Santa Barbara Infrared Chief Technology Officer	Santa Barbara, CA 2025 - present
○ Chief Technology Officer for industry leader in electro-optical and infrared hardware and test equipment. Product lines include industry-benchmark MEMS-based infrared scene projectors, EO/IR blackbodies, optical collimators, target projectors and more. Responsible for all elements of new product development, technical execution, staff technical training, research and development, vendor and customer interfaces, including Prime, USG, and international customers.	
Terran Orbital—A Lockheed Martin Company Director and Chief Architect	Irvine, CA 2024 - 2025
○ Director of Platforms and Mission Engineering and enterprise-wide Chief Architect, owning technical product development and alignment across the company at module, bus, space vehicle, and system levels, and supporting technical processes. Functional management of Platforms and Mission Engineering directorate, which owns systems architecture; product engineering; and guidance, navigation and control engineering throughout company (18 direct reports). Day-to-day responsibilities included detailed technical development, analysis, and design at bus, payload, and vehicle level; process development; vendor and customer management; business development; and other enterprise support activities, such as root cause and corrective action.	
○ Chief Engineer, space segment technical and IPT lead on a 10-satellite constellation on SDA Tranche 2 Tracking Layer Gamma program (\$254M prime USG contract, Terran's first). Owned space segment technical design and programmatic execution, including subcontractor/vendor relationships, system requirements, and program technical processes. Led program through successful SRR. Chief architect for Terran's first capture and development contract with a Japanese customer, MELCO. Led successful RCCA investigation and implementation of propulsion system rework of 42 Tranche 1 Tracking Layer SVs.	
Lockheed Martin Space Senior Manager, EO/IR Systems Engineering, Mission Performance, and Test	Sunnyvale, CA 2022 - 2024
○ Lead a systems engineering organization of 80+ engineers (spread over CA, CO, and PA) whose work encompasses systems engineering, integration, test, and performance for LM's active and passive EO/IR sensor payload portfolio. Previously led separate mission performance and data processing organization of 30+ engineers whose work lay at forefront of computer vision and advanced mission data processing executed on orbit and on the ground.	
○ Oversee LM Space product strategy in the development of AI, ML, algorithms, processing, and simulations, and coordinate the same across the LM Enterprise. With program management/PXO, I ensure program, IRAD, and capital projects implementing my team's products execute successfully.	
○ Outside my management responsibilities, I continue to contribute to technical execution across mission areas, including: HSI system and algorithm development, event-based sensor architecture and signal processing design, and signal processing and overall mission performance of the Hawkeye Sensor on NGI. I am the architect, PI, and primary technical developer of LM's novel level 2 sensor data fusion capability (L2FE), was technical lead on successful capture of LM's first contract with an O&G company, and guided its execution.	
Raytheon Intelligence & Space Chief System Architect and Associate Director, Systems Engineering Center Senior Principal Systems Engineer	El Segundo, CA 2021 - 2022 2019 - 2021
○ Signal Chain Architect and Performance Lead, NGG OPIR. Led development and design of novel algorithms and space and ground signal chains. Wrote implementations for self-consistent onboard adaptive spatiotemporal data packet allocation and target identification; onboard image processing; and ground signal chain and data packet management on go-fast Next Gen OPIR Geo program through successful PDR, CDR, and competitive downselect against incumbent, with designs used on multiple other programs. Led 16-engineer team through further design, development, and performance analysis activities and development of performance assessment environment. Technical Lead, R3 resiliency	

effort. \$1.2B in new business secured.

- Chief Mission Architect and Analyst, SDA Tranche I Tracking Layer (\$250M prime contract).
- Performance Lead for photonic integrated circuit-based optical phased array communication networks (Kyber) and the same for Everlong. Created novel concepts and algorithms for automated PIC layout and calibration techniques. LSE, Laser Communication Subsystem (Everlong).
- Lead Architect and Systems Engineer, Alma. PI, Rushmore Tech I. Perf. CPT Lead, Verona (led 14 senior engineers across the US). Chief System Architect, STACK, a novel integrated PNT+crypto. authentication protocol. Mission Performance Lead, Track Custody Demonstration (\$605M prime contract for ensuing Missile Track Custody).

RAND Corporation

Santa Monica, CA

Associate Physical Scientist

2018 - 2019

Developed design, optimization, and analysis products for US Government customers, including:

- Methodology for defining resilient space enterprise in support of Joint Force. Developed analytical framework for assessing and designing resilient and hardened space systems and constellations, and created numerous supporting high fidelity models (USAF).
- Identified requirements for future SDA Tracking and Transport Layer constellations at tactical, operational, and strategic levels. Created and delivered tools to model proliferated LEO constellations from cradle to grave to replenishment to ID manufacturing, launch, management, and reconstitution requirements and to optimize architecture (OSD).
- Developed and delivered codeset to optimize operational energy transport scheduling and allocation for maritime domain and littoral interfaces at strategic and operational levels for wargaming and operations (OSD). Developed mathematical framework for optimization of Mosaic warfare systems (DARPA).

The Aerospace Corporation

El Segundo, CA

Senior Member of Technical Staff

2017 - 2018

- Principal Investigator, Project Delphi (2017 - 2018). Led initiative through corporation's iLab to develop techniques to forward engineer innovative concepts for the Corporation and its customers. Project included need-space and solution-space generation exercises integrated with concurrent engineering/concept design methodologies, with demonstration through several case studies.
- Lead, Project Rogue Flash (2018). Team generated out-of-the-box concepts for rapid missile defense and warning capability reconstitution. Team member, Project Thor Blue/Black Swan Futures Foresighting workshop (2018).
- Developed network analysis toolset (with Monte Carlo capabilities) for utility, reliability, resiliency, and link budget systems characterization. Developed models for optical communication networks, including novel acquisition probability and optimization calculations.
- Other activities: Participated in architecture-level design activities and supported end-to-end modeling. Developed utilities in Python and VBA to improve architecture-level mission analysis and Enterprise information exchange (2017-2018); mentored interns on planetary defense study through Concept Design Center (2017); and supported Hosted Payload Office (2017).

Teaching

- Former adjunct faculty at Santa Monica College in Physical Sciences Department. Past teaching experience at MIT, the Politecnico di Torino in Italy, and University of Pennsylvania. Details available upon request.

Publications and Presentations

- Extensive list of publications includes journal articles, conference proceedings, book chapters, and refereed abstracts. Extensive list of presentations includes conference talks and formal design reviews. Details available upon request.

Additional Details

- **Computing:** MATLAB, Simulink, AutoCAD, Pro/E, SolidWorks, Inventor, CATIA, UN*X, VBA, $\text{\LaTeX}$, Python, R, experience with C++, IDL, and DELMIA
- **Languages:** English, Italian, Latin, Gujarati, varying levels of familiarity with several other languages
- **Art:** Extensive portfolio of engineering/architectural design, figure drawing, and other artwork
- **Writing:** Details available upon request
- **Mentoring:** I have mentored undergraduate and graduate students at MIT, Penn, Stanford, and Princeton. Details available upon request.
- **Outreach and Other Activities:** Reviewer for *AJ*, *ApJ*, and *MNRAS*. Advisor, MIT Alumni Advisors Hub. Member, Benjamin Franklin Society, University of Pennsylvania. Director's Council Member, University of Pennsylvania Museum of Archaeology and Anthropology. Further details available upon request.

Selected Intellectual Property, Awards, Honors, and Fellowships

- "Photonic Integrated Circuit-Based Optical Phased Array Calibration Technique", US Patent 11,988,903 B2
- LTI Award (presented to < 1% employees), Lockheed Martin Space, 2023
- Invention Award, Raytheon Technologies, 2021
- Patent Award, Raytheon Technologies, 2021
- 2020 Innovators Award (2 $\times$), Raytheon I&S, 2020
- Invention Award, Raytheon Technologies (2 $\times$), 2020
- Achievement Award, Raytheon Intelligence & Space, 2020
- Finalist, Raytheon Innovation Challenge, 2020
- Asteroid 134180 Nirajnamdar named for me, 2016
- Robert R. Shrock Fellowship, 2015 - 2016
- On the Spot Award, MIT Division of Student Life, 2015
- Grayce B. Kerr Fellowship, 2014 - 2015
- Award for Excellence in Teaching, MIT Department of Earth, Atmospheric and Planetary Sciences, 2014
- Achievement Award, Raytheon SAS, 2009
- Research Fellowship, Draper Labs, 2009 - 2011
- Spotlight on Perf. Award, RF Surveillance Group, Raytheon SAS, 2009
- Engineering Excellence Award, Boeing Integrated Defense Systems, 2006