

Niraj K. Inamdar, Ph.D.

Education

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

Professional Experience: Details

Chief Technology Officer, Santa Barbara Infrared, Inc.

Santa Barbara, California	2025 - present
Chief Technology Officer for industry leader in electro-optical and infrared test and characterization systems. Product lines include industry-benchmark MEMS-based infrared scene projectors, blackbodies, optical collimators, target projectors, and integrated EO/IR test systems. 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.	

Director and Chief Architect, Terran Orbital—A Lockheed Martin Company

Irvine, California	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. Led successful RCCA investigation and implementation of propulsion system rework of 42 Tranche 1 Tracking Layer SVs. - 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 12 subcontractor/vendor relationships, system requirements, and program technical processes. Led program through successful SRR (11/2024). Chief Architect for Big Dawg SDA Constellation proposal (\$300M prime contract). Chief architect for Terran's first capture and development contract with a Japanese customer, MELCO (opticalcom platform; \$5M)	

Senior Manager, EO/IR Systems Engineering, Mission Performance, and Test, Lockheed Martin Space

Sunnyvale, California	2022 - 2024
- I led a systems engineering organization of 80+ engineers (spread over California, Colorado, and Pennsylvania) whose work encompasses systems engineering, integration, test, and performance for Lockheed Martin's active and passive EO/IR sensor payload portfolio across the National Security Space, Military Space, and Civil & Commercial Space lines of business. Previously, I led a separate mission performance and data processing organization of 30+ engineers whose work lay at the forefront of computer vision and advanced mission data processing executed both on orbit and on the ground for LM's EO/IR space systems. - With program management/PXO, I ensured program, IRAD, and capital projects implementing my team's products executed successfully and in support of LM Space's short-, medium-, and long-term objectives. I architected LM Space product strategy in the development of mission data processing, signal chains and algorithms (leveraging traditional- and AI/ML-based techniques), modeling, and simulations, and coordinated the same across the LM Enterprise. - Outside the scope of my management responsibilities, I contributed to technical execution across mission areas, including: hyperspectral imaging system and algorithm development, event-based sensor architecture and signal processing design, and signal processing and overall mission performance of the Hawkeye Sensor on the Next Generation Interceptor (\$4B successful competitive downselect). I was 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 oil and gas company, and guided its successful execution through its first phase.	

Raytheon Intelligence & Space

El Segundo, California

Chief System Architect and Associate Director, Systems Engineering Center

2021 - 2022

Senior Principal Systems Engineer

2019 - 2021

Led performance and design activities across broad portfolio of programs—ranging from production programs to IRAD—at all system abstraction levels, and across the spectrum for sensing (EO/IR active and passive; multimode radar) and communications (lasercom and RF) applications. **My work led directly to securing roughly \$2B in business.** Some highlights include:

- **Signal Chain Architect and Performance Lead, NGG OPIR.** Led development and design of new algorithms and space and ground signal chain architectures. Designed and wrote implementations for new self-consistent onboard adaptive spatiotemporal data packet allocation and target detection algorithms (leading to dynamic sensitivity $\sim 10 - 100\times$ greater than legacy techniques); all onboard image processing algorithms; and ground signal chain and data packet management algorithms on go-fast Next Gen Overhead Persistent Infrared (OPIR) Geo program. Designs used on multiple other programs. Constructed high-fidelity image generation and physical effects models (with combinatorial impact analysis) and carried out new characterization of focal plane array data. Led 16-engineer team through further design, development, and integration & test activities (including firmware, software, and optical engineering unit verification and test) and development of mission performance assessment environment through successful PDR, CDR, and competitive downselect against incumbent. Technical Lead, R3 resiliency effort. **\$1.2B in new business secured.**
- **Chief Mission Architect and Analyst, SDA Tranche 1 Tracking Layer (\$250M prime contract).**
- Created new algorithms for high-throughput automated photonic integrated circuit (PIC) layout and developed new optical phased array voltage mapping, calibration, and steering techniques. Constructed end-to-end system performance models for PIC-based optical communication networks (Kyber) and the same for Everlong. **LSE, Lasercom Subsystem, Everlong.**
- **Lead Architect and Systems Engineer, Alma. Primary Investigator, Rushmore Tech I. Performance CPT Lead, Verona portfolio** (led 14 senior engineers across the US). **Chief System Architect, STACK (Space-time Adaptive Cryptography and Kinematics),** a new integrated PNT+cryptography authentication protocol. **Mission Performance Lead, Track Custody Demonstration (\$605M prime contract for ensuing Missile Track Custody).**

Associate Physical Scientist, RAND Corporation

Santa Monica, California

2018 - 2019

Developed design, optimization, and analysis products for execution and operations in all service branches, with primary customer focus and interface at OSD, AFSPC, and DARPA. Some highlights include:

- **Methodology for defining resilient space enterprise in support of Joint Force.** Lead. Developed analytical framework for assessing and designing resilient and hardened space systems and constellations, and created numerous supporting high fidelity models (missile dynamics, air- and spacecraft dynamics and detection, and radiation effects). Sponsor: US Air Force (USAF).
- **PLEO constellations.** Lead. 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).
- **Modeling operational energy requirements and distribution.** Lead. 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. Sponsor: Office of the Secretary of Defense (OSD).
- **Mosaic warfare.** Developed mathematical framework and models for optimization of Mosaic warfare systems (DARPA).
- **Fast acquisition for TRMC.** Lead. Identified driving and nascent capabilities and technologies for space, quantum computing, and air autonomy test and evaluation, assessed current infrastructure, and recommended actions for new ones. Developed taxonomy for space threats, offensive and defensive space capabilities, corresponding concepts and physical models (OSD).
- **Space Mission Force readiness.** Lead. Created interactive visualization tool to track operational task and readiness relationships for the Air Force, with primary application towards Space Mission Forces (USAF).

Other FY19 projects included defining and assessing universal C2 languages (OSD) and space launch location investment prioritization (USAF).

Senior Member of Technical Staff, The Aerospace Corporation

El Segundo, California

2017 - 2018

- Principal Investigator, Forward Engineering (2017 - 2018). Led initiative through corporation's iLab to develop techniques to forward engineer innovative concepts for the Corporation and its customers. Project included novel need-space and solution-space generation exercises integrated with concurrent engineering/concept design methodologies, with demonstration through case studies such as lasercom and planetary defense.

- Lead, Project Rogue Flash (2018). Lead of six-person team which generated concepts for rapid missile defense and warning capability reconstitution. Team member, Project Thor Blue/Black Swan Futures Foresighting workshop (2018).
- Created flexible 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.
- Mission Analysis Engineer, Surface Water & Ocean Topography (SWOT; 2017 - 2018). Performed earned value management for NASA mission. Developed software utilities in Python and Excel to significantly decrease analysis time (from 8+ hours to a few seconds) and increase analysis fidelity through IMS/EVM tool interface.
- High-level responsibilities included participating in broad range of architecture-level design activities (with emphasis on development and evaluation of innovative and cost-effective space systems architectures, concepts, and performance) and supporting end-to-end modeling.
- Other activities included: Developing a variety of utilities in Python and VBA to improve architecture-level mission analysis and Enterprise information exchange (2017 - 2018); mentoring graduate and undergraduate interns on planetary defense study through Concept Design Center (2017); and supporting Hosted Payload Office through interface requirements definition and document generation (2017).

Research Assistant, Massachusetts Institute of Technology

Cambridge, Massachusetts

2011 - 2016

- Constructed the first self-consistent planet formation models accounting for core-nucleated gas accretion, thermal evolution, and dynamical interactions via giant impacts in order to constrain formation pathways for super-Earths and mini-Neptunes. Wrote novel code (including shock hydrodynamics and thermal evolution models) and interpolation routines. Several manuscripts in varying stages of preparation in addition to those already published, as well as work reconstructing the natural remanent magnetism of asteroid 433 Eros using SPICE kernels and observational constraints (2014 - 2016).*
- Science and Optics Lead for [REXIS](#), an X-ray imaging spectrometer which will examine surface composition of asteroid 101955 Bennu for NASA's [OSIRIS-REx](#) mission. Constructed instrument system performance model, modeling Solar X-ray and asteroid fluorescence spectra, as well as instrument response (including radiation damage) and data interpretation in order to determine whether REXIS can place Bennu within an analogue meteorite class and infer its formation history (2012- 2014). Led team based at MIT and Harvard-Smithsonian CfA. Carried out instrument cover deployment dynamics and shielding analysis, coded aperture mask and frame design, and engineering model thermal test (2011 - 2014).
- Developed quaternion dynamics models, leapfrog integrator, and control laws in MATLAB and Simulink for NIAC-funded project investigating use of high-temperature superconductors for electromagnetic formation flight and structures deployment (2011 - 2012).
- Modeled dynamics and control of small satellite optical communication systems for startup Planetary Resources, Inc. (PRI) from inception of the company and under NAIC funding. Built testbed with telescopes and demonstrated tip-tilt mirror laser control (2012 - 2013).

Research Assistant, MIT & Charles Stark Draper Laboratory

Cambridge, Massachusetts

2009 - 2011

- Conducted research in microfluidics towards development of new devices for *in vitro* biomedical applications (advisors: Dr. Jeffrey Borenstein of Draper Labs and Prof. Linda Griffith of MIT).
- Developed the first analytical model characterizing solute transport and consumption in bilayer geometry and extended classical Sturm-Liouville theory of PDEs into multiple adjacent domains connected via Robin boundary conditions.
- Designed, built, populated, and analyzed bilayer microfluidic devices with hTERT mesenchymal stem cells. Research supported under Award Number R01EB010246 from the National Institute of Biomedical Imaging and Bioengineering.

Mechanical Engineer, Raytheon Space and Airborne Systems

El Segundo, California

2008 - 2009

- Design and drafting of assemblies for next generation radar and processing systems, Global Hawk and ASARS
- Sustaining mechanical engineer, AESA; sustaining mechanical engineer, P1196; and mechanical engineering lead, Transmit Drive integrated microwave assembly, MIRA. Mechanical design in Pro/E and circuit board layout in AutoCAD and Pantheon. Significant collaboration with electrical engineers and vendors throughout the design process.

* Passed doctoral qualifying exams in Mechanical Engineering Department in 2012. Switched to Earth, Atmospheric and Planetary Sciences Department in February 2014 and passed doctoral qualifying exams there in 2014.

Research Assistant, University of Pennsylvania School of Engineering and Applied Science

Philadelphia, Pennsylvania

2007 - 2008

- Optimized fabrication of carbon nanopipettes for biomedical applications using vapor deposition towards creating more graphitic (and less amorphous) probes ($\phi \approx 0.4 \mu\text{m}$; advisors: Prof. Haim Bau and Dr. Michael Schrlau).
- Investigated and developed methods of creating metallic pipettes/biological nanoprobes from Au and Ag.

Intern, Boeing Integrated Defense Systems, Satellite Development Center

El Segundo, California

Mechanical and Structural Engineer

2007

- Created engineering drawings and solid models. Supported a number of actions as liaison between Mechanical & Structural Engineering and Manufacturing Engineering, including reviewing processes, validating engineering drawings, and developing build plans and statements of work for programs such as MSV and Protostar.

Manufacturing Engineer

2006

- Created virtual, interactive simulations of satellite assembly, integration, and test processes in Advanced Technologies group in the Manufacturing Engineering homeroom.

Teaching**Adjunct Faculty, Santa Monica College Department of Physical Sciences**

Santa Monica, California

2017 - 2020

- Instructor for Engineering 11, *Engineering Graphics and Design*, during the fall terms of 2017 and 2018 and spring terms of 2019 and 2020. Designed the course to introduce students to the design life cycle (including need space generation, concept design, engineering design, and manufacturing) using wholly original course material and a guided term design project.
 - Also taught solid modeling/CAD, engineering drawing creation, and geometric dimensioning & tolerancing.
- Instructor for Engineering 16, *Dynamics*, during the spring terms of 2018 and 2019. Topics covered include kinematics of particles, systems of particles, rigid body dynamics, and mechanical vibrations and stability. Created all original lecture material and coding/modeling-based term project. [Original textbook written.](#)

Teaching Assistant, MIT Departments of Earth, Atmospheric and Planetary Sciences and Physics

Cambridge, Massachusetts

2014-2015

- Teaching assistant and grader for course 8.290/12.425/12.625, *Extrasolar Planets: Physics and Detection Techniques*, with Prof. Hilke Schlichting during the spring term of 2015, and Profs. Hilke Schlichting and Sara Seager during the spring term of 2014.
- Wrote significant amount of original course material, including physics notes and code for data analysis and planetary interior structure integration.

Teaching Assistant, MIT Department of Earth, Atmospheric and Planetary Sciences

Cambridge, Massachusetts

2014

- Teaching assistant and grader for course 12.098/12.S680, *Formation and Evolution of Planetary Systems*, with Prof. Hilke Schlichting during the fall term of 2014.

Visiting Instructor, Space Mission and System Design Program, Politecnico di Torino

Turin, Italy

2014

- One of three visiting instructors from MIT for a course in the Space Mission and System Design program for M.Sc. students at Politecnico di Torino (24 March-30 March and 28 May-15 June).
- Program focused on developing science and engineering requirements for a CubeSat mission to Mars, with my focus on applications to the Martian atmosphere and future habitability.

Teaching Assistant, MIT Department of Earth, Atmospheric and Planetary Sciences

Cambridge, Massachusetts

2013

- Teaching assistant and grader for course 12.815/12.816, *Atmospheric Radiation*, with Prof. Sara Seager during the fall term of 2013.
- Wrote significant amount of course material for students, including notes, 2D and 3D Monte Carlo scattering code, and code for correlated- k distribution radiative transfer.

Teaching Assistant, MIT Department of Aeronautics and Astronautics

Cambridge, Massachusetts

2011

- Teaching assistant for course 16.83, *Space Systems Engineering*, with Prof. Sara Seager and others during the fall term of 2011.

Teaching Assistant, University of Pennsylvania School of Engineering and Applied Science

Philadelphia, Pennsylvania

2006-2007

- Teaching assistant and grader for MEAM 245, *Introduction to Flight*, with Dr. Bruce Kothmann during the fall term of 2007 and Prof. Ira M. Cohen during the fall term of 2006.

Other Academic Employment

Graduate Resident Tutor, East Campus Dormitory, Massachusetts Institute of Technology

Cambridge, Massachusetts

2014 - 2016

- Live-in mentor for the Fifth East hall in MIT's East Campus dormitory

Laboratory Manager, Weiss Tech House, University of Pennsylvania

Philadelphia, Pennsylvania

2005 - 2008

- Managed open student laboratory and makerspace for the University, including logistics, lab set-up, drafting laboratory regulations, and lab instruction for both engineering and non-engineering students
- Held seminars and one-on-one sessions in design mentoring. Office hours held several hours per week focusing on mentoring, tutoring, CAD, and lab help.

Publications and Presentations

Journal Articles

- **N.K. Inamdar** and H.E. Schlichting. "Stealing the Gas: Giant Impacts and the Large Diversity in Exoplanet Densities". *Astrophysical Journal Letters*, **817** (2016).
- **N.K. Inamdar** and H.E. Schlichting. "The Formation of Super-Earths and Mini-Neptunes with Giant Impacts". *Monthly Notices of the Royal Astronomical Society*, **448** (2015).
- **N.K. Inamdar** and J.T. Borenstein. "Microfluidic cell culture models for tissue engineering". *Current Opinion in Biotechnology*, **22** (2011).
- **N.K. Inamdar**, L.G. Griffith, J.T. Borenstein. "Transport and shear in a microfluidic membrane bilayer device for cell culture". *Biomicrofluidics*, **5** (2011).
- D. Byun, Y. Lee, S.B.Q. Tran, V.D. Nguyen, S. Kim, B. Park, S. Lee, **N. Inamdar**, and H.H. Bau. "Electrospray on super-hydrophobic PTFE surface nozzle treated by Ar and O₂ ion beam". *Applied Physics Letters*, **92** (2008).

Refereed Conference Proceedings

- **N.K. Inamdar**, R.P. Binzel, J. Hong, B. Allen, J. Grindlay, R.A. Masterson. "Modeling the Expected Performance of the REolith X-ray Imaging Spectrometer (REXIS)". In: Proceedings of SPIE; 2014 August 18; San Diego, CA.
- D.B. Carte, **N.K. Inamdar**, M.P. Jones, R.A. Masterson. "Design and Test of a Deployable Radiation Cover for the REolith X-ray Imaging Spectrometer (REXIS)". In: Proceedings of the 42nd Aerospace Mechanisms Symposium; 2014 May 14-16; Baltimore, MD.
- B. Allen, J. Grindlay, J. Hong, R.P. Binzel, R. Masterson, **N.K. Inamdar**, M. Chodas, M.W. Smith, M.W. Bautz, S.E. Kissel, J. Villaseñor, M. Oprea, N. Induni. "The REolith X-Ray Imaging Spectrometer (REXIS) for OSIRIS-REx: Identifying Regional Elemental Enrichment on Asteroids". In: Proceedings of SPIE; 2013 September 5; San Diego, CA.
- **N. Inamdar**, L.G. Griffith, J. Borenstein. "Transport Model for Microfluidic Device for Cell Culture and Tissue Development". *Mater. Res. Soc. Symp. Proc.*, **1299** (2010).

Refereed Abstracts

- J. Hong, B. Allen, J.E. Grindlay, R.P. Binzel, R. Masterson, **N.K. Inamdar**, M. Chodas, M.W. Smith, M.W. Bautz, S.E. Kissel, J.N. Villaseñor, A. Oprea. "REolith X-Ray Imaging Spectrometer (REXIS) Aboard NASA's OSIRIS-REx Mission". In: American Astronomical Society Meeting Abstracts #224; 2014 June 1-5; Boston, MA.
- F. Nichele, S. Corbino, S. Seager, M. Knapp, **N. Inamdar**, V. Stamenkovic. "Three Scenarios for Valuable Planetary Science Missions on Mars: Next Generation of Cubesats to Support Space Exploration". In: Proceedings of the 65th International Astronautical Congress; 2014 September 29-October 3; Toronto, Canada.
- H.L. Bralower, **N.K. Inamdar**, S.E. Falcone, R.A. Masterson. "Design and Test of a Deployable Radiation Cover for the REolith X-ray Imaging Spectrometer (REXIS)". In: Proceedings of the 42nd Aerospace Mechanisms Symposium; 2014 May 14-16; Baltimore, MD.
- E.A. Vitol, M.G. Schrlau, **N. Inamdar**, H.H. Bau. "Raman spectroscopy analysis of synthesis effects on carbon nanopipette properties". In: Proceedings of the 236th National Meeting of the American Chemical Society; 2008 August 17-21; Philadelphia, PA. Division of Analytic Chemistry ANYL 398.

Book Chapters and Other Publications

- **Niraj K. Inamdar**. “Time Difference of Arrival Source Localization: Exact Linear Solutions for the General 3D Problem.” [arXiv: 2501.01076](#) (2024).
- **Niraj K. Inamdar**. “Small Satellite Optical Communication Networks: Analytical Models.” [arXiv: 1807.10393](#) (2018).
- **Niraj K. Inamdar** and 8 others. “Enhancing Decision Support for Assessing Space Mission Assurance: Technical Companion.” RAND PR-3591/1-AF (2018; [refereed](#)).
- **Niraj K. Inamdar** and 8 others. “(U) Enhancing Decision Support for Assessing Space Mission Assurance: Policy Report.” RAND PR-3591-AF (2018; [refereed](#)).
- **Niraj K. Inamdar** and 5 others. “Operational Energy Decision Aide: A Tool for Estimating Energy Use to Support Planning and Wargaming Activities.” RAND PR-3927-DHS (2018; [refereed](#)).
- **Niraj K. Inamdar** and 14 others. “Technology Investment Priorities to Improve First Response Capabilities.” RAND PR-3874-DHS (2018; [refereed](#)).
- Sivan Ginzburg, **Niraj K. Inamdar**, Hilke E. Schlichting. “Super-Earths: Atmospheric Accretion, Thermal Evolution and Envelope Loss”. [Book chapter](#) for *Formation, Evolution, and Dynamics of Young Solar Systems*. Springer (2017).
- **Niraj K. Inamdar**. “The (Non-)Magnetization of 433 Eros: Possible Mechanisms for the Lack of Magnetism as Measured by NEAR.” [arXiv: 1807.10393](#) (2013).
- **N.K. Inamdar**, L.G. Griffith, J.T. Borenstein. “Transport Models for 3-Dimensional Cell Culture Systems”. [Book chapter](#) for *Microfluidic Cell Culture Systems*. Elsevier (2013).
- G.V. Gettliffe and **N.K. Inamdar**. “High-Temperature Superconductors as Electromagnetic Deployment and Support Structures in Spacecraft”. NASA NIAC Phase I Final Report (2012).

Some Talks, Poster Sessions, and Technical Reviews

- “Electro-optical/Infrared Testing.” Guest lecture for UC Santa Barbara Infrared Short Course. Provided overview of EO/IR testing hardware, systems, and measurements to over 40 industry professionals and students. 2026 June 25; Santa Barbara, CA.
- “Exploring Careers and College Majors”. Two 1-hour guest lectures for Counseling 12 at Santa Monica College for students exploring STEM careers. Also provided offline teaching material and mentoring to students who wished to further explore technical topics. 2022 October 10 and 17; online.
- “Building a Team (and a Payload) for the Next Generation”. Nominated by Vice President of Space & C2 to give Raytheon Intelligence & Space CEO and executive leadership “RED Talk”. 2021 September 21; El Segundo, CA.
- “Space Optical Communication Networks”. Held an invited half-day Raytheon-wide workshop on architecting space systems with a particular focus on optical communication networks. All-original presentation material supplemented with tool created for attendees, with modules on constellation design, atmospheric effects, and uplink and downlink budgets. 2020 November 2; online.
- “The Theoretical Minimum: Building a Common Analytical Toolset Across STEM Fields”. Held two invited workshops at Santa Monica College focusing on overarching mathematical themes across STEM fields. First focused on linear algebra, built up the theory of representations, and highlighted applications across various disciplines of tools like orthogonal basis expansions and Rayleigh quotients. Second workshop focused on differential equations and focused on practical techniques such as nondimensionalization, order of magnitude analysis, and numerical implementation; 2019 November 27 and December 6; Santa Monica, CA.
- “The Diversity of Observed Exoplanetary Systems: Pathways to Exoplanet Formation”. Invited talk for AIAA Exoplanets: In Search of Habitable Worlds Mini-Conference; 2019 August 21; Manhattan Beach, CA.
- “Visitors from Our Solar and Galactic Neighborhood: ‘Oumuamua and the Possibility of Visits by Rocks from Exoplanetary Systems”. Invited talk for AIAA Planetary Defense & Asteroid Exploration Mini-Conference; 2019 June 29; Rolling Hills Estates, CA.
- “The Story of Our Solar System as Told By Asteroids”. Invited talk for AIAA Planetary Defense & Asteroid Exploration Mini-Conference; 2018 June 30; Redondo Beach, CA.
- “Satellites, Telescopes, and Space Probes: Journeying into the Solar System (and Beyond)”. Invited guest lecture for EPS SCI 9, *Solar System and Planets*, at UCLA; 2018 March 15; Los Angeles, CA.
- “Pathways to Exoplanet Formation: Insight into the Diversity of Observed Exoplanetary Systems”. Aerospace Corporation Astronomy Club Talk; 2017 May 4; El Segundo, CA.
- “The Formation and Evolution of Planetary Systems”. Public thesis defense; 2016 August 2; Cambridge, MA.
- “Stealing the Gas: Giant Impacts and the Large Diversity in Exoplanet Densities”. Sant Cugat Forum on Exoplanets; 2016 April 21; Sant Cugat del Vallès, Spain.

- “Pathways to Exoplanet Formation: Insight into the Diversity of Observed Exoplanetary Systems”. Brown University Planetary Geosciences Lunch Colloquium; 2016 April 14; Providence, RI.
- “Pathways to Exoplanet Formation: Insight into the Diversity of Observed Exoplanetary Systems”. MIT Planetary Science Colloquium Series; 2015 December 8; Cambridge, MA.
- “The Formation of Super-Earths and Mini-Neptunes with Giant Impacts”. Poster session at 2015 Sagan Summer Workshop; 2015 July 27-31; Pasadena, CA.
- Invited speaker for MIT Department of Earth, Atmospheric, and Planetary Sciences Department Patron’s Circle fundraising event; 2015 April 8; Cambridge, MA.
- “The Formation of Super-Earths and Mini-Neptunes with Giant Impacts”. Physics of Exoplanets: From Earth-sized to Mini-Neptunes, Kavli Institute for Theoretical Physics; 2015 February 23-27; Santa Barbara, CA.
- “The Formation of Super-Earths and Mini-Neptunes with Giant Impacts”. MIT Planetary Science Colloquium Series; 2014 November 12; Cambridge, MA.
- “Modeling the Expected Performance of the REGolith X-ray Imaging Spectrometer (REXIS)”. Presented at the SPIE Optics + Photonics Conference; 2014 August 18; San Diego, CA.
- “Telescope System” and “Systems Performance Modeling”. REXIS Critical Design Review; 2014 February 18-19; Cambridge, MA.[†]
- “Elements of Spectroscopy”. MIT Space Systems Laboratory Seminar; 2013 May 17; Cambridge, MA.
- “REXIS”. Presented at the Annual Gathering of New England Planetary Scientists; 2013 April 27; Boston, MA.
- “Imaging System” and “Systems Performance Modeling”. REXIS Preliminary Design Review; 2013 January 31-February 1; Cambridge, MA.[†]
- “Science Overview”. REXIS Systems Requirements Review; 2012 January 23; Cambridge, MA.[†]
- “Transport Characteristics of Bilayer Device for Cell Culture and Tissue Development”. Poster session at the Annual Meeting of the Biomedical Engineering Society; 2011 October 13; Hartford, CT.
- “Transport Model for Microfluidic Device for Cell Culture and Tissue Development”. Poster session at the Materials Research Society Fall Meeting; 2010 November 30; Boston, MA.

Working Papers and Technical Notes

- Available upon request

Additional Details

- **Computing:** MATLAB, Simulink, AutoCAD, Pro/E, SolidWorks, Inventor, CATIA, UN*X, VBA, L^AT_EX, 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:** One undergraduate from the MIT EAPS Department on her Bachelor’s thesis (Z. Megyery, 2012), one undergraduate researcher (UROP) from the MIT AeroAstro and EAPS Departments for his work on REXIS (H. Siu, 2013), one EAPS UROP for his work on the transit signatures of planets with ring systems (R. Romero, 2014), and a number of others (graduate and undergraduate) on a less formal basis at both MIT and Penn. I have also mentored a senior undergraduate from Memorial University (Canada; 2013-2014); two graduate interns at Aerospace Corporation (2017); an International Baccalaureate student on mathematically modeling tire evolution, race strategy, and scheduling in Formula 1 (2021); multiple junior engineers at Raytheon (2019-2022); a master’s student in computer science at Stanford (S. Nethi, 2023-2024); a mechanical engineering undergraduate at Princeton (C. Gonzalez, 2025-present); and a mechanical engineering and business undergraduate at Penn (C. Yan, 2025-present).
- **Outreach and Other Activities:** An Astronomical Event (MIT, 9 October 2012); AAAS Annual Meeting Family Days (Boston, 16 February 2013); EAPS Patron’s Circle (MIT, 8 April 2015 and 7 April 2016); Boston: Sink or Swim (Boston Athenæum, 21 September 2015); and other MIT departmental, graduate student, and UROP outreach events (2013-2016). Co-organizer of MIT’s Planetary Science Colloquium Series (September 2015-August 2016). Reviewer for *Astronomical Journal*, *Astrophysical Journal*, and *Monthly Notices of the Royal Astronomical Society* (2016-present). Advisor, MIT Alumni Advisors Hub. Member, Benjamin Franklin Society, University of Pennsylvania. Director’s Council Member, University of Pennsylvania Museum of Archaeology and Anthropology.
- **Media:** Interviewed for work on exoplanets, work on REXIS, and work at MIT in general.[‡] Exoplanet work covered in “astrobites” astrophysics blog.[§]

[†] Presented to NASA Goddard Space Flight Center and external reviewers

[‡] https://www.youtube.com/watch?v=--MeKE_OUNU and <https://www.youtube.com/watch?v=Y2UiRam0uaI>

[§] <http://astrobites.org/2014/12/31/how-a-super-earth-gets-its-atmosphere-or-at-least-where-it-doesnt/>

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×), Raytheon I&S, 2020
- Invention Award, Raytheon Technologies (2×), 2020
- Achievement Award, Raytheon Intelligence & Space, 2020
- Finalist, Raytheon Innovation Challenge, 2020
- Asteroid 134180 Nirajinamdar named for me, 2016
- Robert R. Shrock Fellowship, 2015 - 2016
- Grant recipient, de Florez Fund for Humor, MIT, 2015
- 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
- Membership, Sigma Xi, 2011 (Declined)
- Research Fellowship, Charles Stark Draper Laboratory, 2009 - 2011
- Achievement Award, Raytheon SAS, 2009
- Lester B. Knight Fellowship, 2009 (Declined)
- Spotlight on Performance Award, RF Surveillance Group, Raytheon SAS, 2009
- Vittorini Prize, Finalist for Italian Composition, 2008
- Engineering Excellence Award, Boeing Integrated Defense Systems, 2006

[¶]<https://patents.google.com/patent/US11988903B2/en>