

Siddharth Maddali, Ph.D

Research Scientist, GPG/BBP Division (Broadband Plasma)



NOTE: Icons are clickable links.

Education

Ph.D, Applied physics/materials science — Carnegie Mellon University	Pittsburgh, PA, USA 2010 — 2016
MS, Physics — Carnegie Mellon University	Pittsburgh, PA, USA 2009 — 2010
M.Sc, Physics — Indian Institute of Technology - Madras	Chennai, India 2007 — 2009
B.Sc, Physics, mathematics, electronics — Bangalore University	Bengaluru, India 2004 — 2007

Skills

Proficiency	Physics	Computation	Programming
👉 Research	Fourier optics, diffraction, scattering, imaging, condensed matter physics	Linear algebra, Hilbert spaces, signal processing, inverse problems, groups, symmetry, geometry	Python, MATLAB, dev. on Linux, scripting, automation
👉 Expert	Quantum & statistical physics, mechanics, electromagnetism, acoustics	Data science, statistics, probability, visualization, complex analysis	Parallel computing/HPC, GPU programming
📄 Functional	Instrumentation/experimental design, nonlinear dynamics	Differential equations, machine learning, combinatorics	C/C++, Linux sysadmin
📄 Elementary	Dynamical systems, field theory	Bayesian inference, uncertainty quantification	HTML, Javascript, CSS

Experience

KLA Corp. (KLA-Tencor) Research Scientist: Broadband Plasma (BBP) Division — Computational imaging and characterization with broadband electromagnetic probes	Milpitas, CA, USA Nov 2022 — present
Argonne National Laboratory Staff Scientist: Materials Science Division — Imaging: Inverse problems for 3D nanoscale materials imaging using coherent X-ray probes. — Time-resolved studies: Signal processing methods for XPCS at free electron laser facilities. — Experiments: POCs & demonstrations for the above at APS/future APS-U instruments. — Fundraising: Research grants (LDRD, DoE), APS, ESRF user-time proposals. — Dissemination/Outreach: Publications, peer review, editorship, conferences, tech reports. — Mentoring/Organization: Postdocs, students (unofficial), workshop planning/chairing.	Chicago, IL, USA Oct 2019 — Oct 2022
Argonne National Laboratory Post-doctoral researcher: Materials Science Division — Coherent X-ray diffraction -based 3D nanoscale materials imaging at very high beam energies.	Chicago, IL, USA Jan 2017 — Sep 2019
National Energy Technology Laboratory Post-doctoral researcher: ORISE Fellow — Machine learning & materials discovery for new steel alloys in optimized power plant components.	Pittsburgh, PA, USA May 2016 — Nov 2016

- Dissertation on mining meso-scale materials physics from high-energy synchrotron data.
- Teaching mechanics & electromagnetism to undergraduate science majors.

Awards & Grants

- ANL LDRD: *Coherence-enhanced dark-field X-ray microscopy* (PI; \$930,000).
- ANL LDRD: *Detecting critical micro-structural processes with AI* (PI, \$100,000).
- Oak Ridge Institute for Science and Education (ORISE) post-doctoral fellowship (2016).
- Indian Institute of Technology Madras Merit Scholarship (2007 — 2009).
- Bangalore University undergraduate rank 5 (2007).