

Siddharth Maddali, Ph.D

Research Scientist (BBP Division)



NOTE: Icons are clickable links.

Education

Ph.D, Applied physics/materials science
— *Carnegie Mellon University*

Pittsburgh, PA, USA
2009 — 2016

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 electromagnetism, 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, 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

Milpitas, CA, USA
Nov 2022 — present

- Computational imaging and characterization with broadband electromagnetic probes
- Inverse problem design

Argonne National Laboratory
Staff Scientist: Materials Science Division

Chicago, IL, USA
Oct 2019 — Oct 2022

- **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.

Argonne National Laboratory
Post-doctoral researcher: Materials Science Division

Chicago, IL, USA
Jan 2017 — Sep 2019

- Coherent X-ray diffraction -based 3D nanoscale materials imaging at very high beam energies.

National Energy Technology Laboratory

Pittsburgh, PA, USA

Post-doctoral researcher: ORISE Fellow

May 2016 — Nov 2016

- Machine learning & materials discovery for new steel alloys in optimized power plant components.

Carnegie Mellon University

Pittsburgh, PA, USA

Graduate student: Physics Dept.

Aug 2009 — Feb 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).