

Siddharth Maddali, Ph.D

Research Scientist, Broadband Plasma Division



NOTE: Icons are clickable links.

Education

Ph.D, Applied physics/materials science — <i>Carnegie Mellon University</i>	Pittsburgh, PA, USA 2009 — 2016
M.Sc, Physics — <i>Indian Institute of Technology - Madras</i>	Chennai, India 2007 — 2009
B.Sc, Physics, mathematics, electronics — <i>Bangalore University</i>	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) Milpitas, CA, USA
Research Scientist: Broadband Plasma (BBP) Division Nov 2022 — present

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

Argonne National Laboratory Chicago, IL, USA
Staff Scientist: Materials Science Division 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 Chicago, IL, USA
Post-doctoral researcher: Materials Science Division 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

Graduate student: Physics Dept.

Pittsburgh, PA, USA

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* (Principal investigator; \$930,000).
- ANL LDRD: *Detecting critical micro-structural processes with artificial intelligence* (Principal investigator, \$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).

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