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**, 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) — 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 — 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).