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

M.Sc, Physics

- Indian Institute of Technology - Madras

B.Sc, Physics, mathematics, electronics

— Bangalore University

Pittsburgh, PA, USA

2009 - 2016

Chennai, India

2007 - 2009

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

Post-doctoral researcher: ORISE Fellow

Pittsburgh, PA, USA May 2016 — Nov 2016

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

Carnegie Mellon University

Pittsburgh, PA, USA

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

P 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).

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