Siddharth Maddali, Ph.D

Research Scientist, GPG/BBP Division (Broadband Plasma)

KLA✚

NOTE: Icons are clickable links.

Summary

Physicist specializing in Fourier optics, microscopy/imaging algorithms and software development for materials science research and the semiconductor industry.

📚 Education

🎓 **Ph.D**, Applied physics — *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, microscopy, condensed matter physics	Linear algebra, imaging, reconstruction, signal processing, inverse problems	Python, MATLAB, development on Linux, scripting, automation
✋ **Expert**	Quantum & statistical physics, mechanics, electromagnetism, acoustics	Statistics, probability, visualization, complex analysis	Parallel computing/HPC, GPU programming
🖐 **Functional**	Semiconductors, Instrumentation/experimental design	Differential equations, machine learning, data science	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

— Optical wafer inspection with broadband illumination

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
<u>**Post-doctoral researcher**</u>: ORISE Fellow May 2016 — Nov 2016

— Machine learning -driven materials discovery applied to steel alloy data for optimized power plant components.

Carnegie Mellon University Pittsburgh, PA, USA
<u>**Graduate student**</u>: 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).

⬚ Hobbies & Activities

Swimming, hiking, biking, table tennis (ping-pong), squash.