

Siddharth Maddali, Ph.D

Research Scientist, GPG/BBP Division (Broadband Plasma)



NOTE: Icons are clickable links.

Summary

Computational scientist with a demonstrated record of research and development. **1+ years** in the semiconductor industry. Previous stints at top US national laboratories. **7+ years' professional experience** in X-ray and optical microscopy, Fourier/wave optics, imaging algorithms, signal processing, high-performance computing, scientific software development and condensed matter physics. Professional with strong fundamentals and a Doctor of Philosophy (Ph.D.) in physics. Passionate about computation in any applied scientific field.

Citizenship: India

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/physical/wave optics, microscopy, diffraction, scattering, condensed matter physics	Linear algebra, imaging, reconstruction, signal processing, inverse problems, simulations	Python, MATLAB, development on Linux, scripting, automation
Expert	Quantum & statistical physics, mechanics, electromagnetism, acoustics	Statistics, probability, visualization, complex analysis	High-performance/parallel computing, GPU programming
Functional	Semiconductors, Instrumentation/experimental design	Differential equations, machine learning, data science	C/C++, Linux sysadmin
Elementary/on the side	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
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— Optical wafer inspection with broadband illumination

Argonne National Laboratory Staff Scientist: Materials Science Division	Chicago, IL, USA Oct 2019 — Oct 2022
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- **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 -driven materials discovery applied to steel alloy data for 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* (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.

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