

# Siddharth Maddali, Ph.D

Research Scientist (BBP Division)



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)**  
**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**

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).

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