# Siddharth Maddali, Ph.D

#### Research Scientist, GPG/BBP Division (Broadband Plasma)







NOTE: Icons are clickable links.

# Summary

Physicist specializing in computational microscopy and imaging for condensed matter systems.

# Education

**Ph.D**, Applied physics

— Carnegie Mellon University

MS, Physics

— Carnegie Mellon University

M.Sc, Physics

— Indian Institute of Technology - Madras

**B.Sc**, Physics, mathematics, electronics

Bangalore University

Pittsburgh, PA, USA 2010 - 2016

Pittsburgh, PA, USA

2009 - 2010

Chennai, India

2007 - 2009

Bengaluru, India 2004 - 2007

#### 7 Skills

Proficiency	Physics	Computation	Programming
	Fourier optics, diffraction, scattering, microscopy, condensed matter physics	Linear algebra, imaging, reconstruction, signal processing, inverse problems	Python, MATLAB, dev. on Linux, scripting, automation
🖔 Expert	Quantum & statistical physics, mechanics, electromagnetism, acoustics	Statistics, probability, visualization, complex analysis	Parallel computing/HPC, GPU programming
☐ Functional	Instrumentation/experimental design, nonlinear dynamics	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)

**Research Scientist**: Broadband Plasma (BBP) Division

- Optical wafer inspection with broadband illumination

**Argonne National Laboratory** 

**Staff Scientist:** Materials Science Division

Milpitas, CA, USA Nov 2022 — present

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.

**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.

### **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).

#### ☐ Hobbies & Activities

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

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