Sajid Ali

PhD Candidate
Applied Physics
Northwestern University

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Education

2016–Present **Northwestern University**, *Evanston, IL*,
Ph.D., Applied Physics,
Computational x-ray optics, Technique development for X-ray Microscopy.

2011–2016 **IIT Madras**, *Chennai, India*,
Masters of Tech. in Microelectronics and VLSI Design Electrical Engg.,
Master's Thesis : Impurity induced magnetism in Graphene.

2011–2016 **IIT Madras**, *Chennai, India*,
Bachelors of Technology, Electrical Engg.,
Minor: Physics.

Research Experience

2018–Present **X-Ray Wave Propagation**,
X-Ray Microscopy Group, Northwestern University, PI: Prof Chris Jacobsen.
- Developing parallelized computer codes for large scale wave propagation.
- Implemented finite difference based wave propagation in PETSc.

2016–2019 **Zone Plate Testing**,
X-Ray Microscopy Group, Northwestern University, PI: Prof Chris Jacobsen.
- Tested high aspect ratio zone plates for efficiency and tilt tolerance at APS and NSLS.
- Developed code to simluate the effect of tilt misalignment.

2015–2016 **Magnetism in Graphene**,
Computaional Condensed Matter Group, IIT Madras, PI: Prof Ranjit Nanda.
- Investigated the magnetic properties of ntercalated bilayer graphene using DFT.
- Performed stability analysis for those which exhibited a non-trivial magnetic moment.

Summer 2015 **A preliminary DFT Study on the stability of cathode materials**,
Center for Automotive Energy Materials, ARCI IITM Research Park, PI: Dr Sahana MB.
- Studied the relative stability of three structural phases of a novel cathode material for Li-ion batteries.
- Created complex heterostructures and studied their electronic structure using DFT.

Teaching Experience

2018 **Dept. of Physics & Astron., Northwestern University**, *Evanston, IL*, Teaching Assistant.
- Undergraduate Lab methods course for calculus based EM
- Led laboratory sections to demonstrate and facilitate experiments.
- Held discussion hours to facilitate learning by one-on-one discussion of homework problems.

2015 **Dept. of Electrical Engg., IIT Madras**, *Chennai, India*, Teaching Assistant.
- Introduction to the basics of scientific computing using C and Python.
- Facilitated lab sessions, held office hours and graded assignments.

Publications

2020 **Tunable hard x-ray nanofocusing with Fresnel zone plates fabricated using deep etching** Kenan Li, **Sajid Ali**, Michael Wojcik, Vincent De Andrade, Xiaojing Huang, Hanfei Yan, Yong S. Chu, Evgeny Nazaretski, Ajith Pattammattel, and Chris Jacobsen *Optica Vol. 7, Issue 5, pp. 410-416 (2020)*

2020 **Effect of tilt on circular zone plate performance** Sajid Ali and Chris Jacobsen *Journal of the Optical Society of America A Vol. 37, Issue 3, pp. 374-383 (2020)*

2018 **Zone Plate Performance as a Function of Tilt Analyzed via Multislice Simulations** Syed Sajid Ali, Kenan Li, Michael Wojcik and Chris Jacobsen *Vol 24, Suppl. S2 (Proc. of the 14th Intl. Conf. on X-ray Microsc. 2018) pp. 298-299*

2016 **Magnetism in intercalated graphene** Sajid Ali, BRK Nanda *AIP Conference Proceedings 1731, 130040*

Conference & Workshops

2019 **PEARC19**, *Chicago, USA*,
Award : Most Outstanding Student Modeling Challenge Presentation.

2019 **PETSc User Meeting**, *Atlanta, USA*,
Talk: X-Ray Wave Propagation in PETSc,
Panel: Simulation Beyond PDEs (Can PETSc do more?).

2018 **X-Ray Microscopy**, *Saskatoon, Canada*,
Poster: Zone Plate Performance as a Function of Tilt Analyzed via Multislice Simulations.

2016 **DAE Solid State Physics Symposium**, *New Delhi, India*,
Poster: Magnetism in Intercalated Graphene.

2014 **Strongly correlated systems: From models to materials**, *Bengaluru, India*,
Workshop on therorical and computational tools to study strongly correlated electron systems.

Outreach, Volunteer and Leadership Experience

2019–Present XSEDE Student Champion at NU

2019–Present Literature Review volunteer at NumFOCUS DISC

2018–Present Contributor to open source software

2018 Taught a class on Emergence for Splash at NU

2013 Graphic Designer for Saarang, IIT Madras

2013 Coordinator for Shaastra Symposium, IIT Madras

2012–2013 Coordinator for Colloquium, IIT Madras

Computer Skills

Programming Python, C, Matlab, Bash

Software PETSc, Scientific Python, QuantumEspresso

Perf. Eng. Intel VTune, Intel APS

Sys. Admin. Spack, Environment Modules, yum, dnf, apt

Soft. Eng. Git , Travis CI, Codecov, Flake8, GNU Debugger

Platforms Linux (CentOS, RHEL, Fedora, Ubuntu), Windows