Arushi Saxena

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Education

Center for Earthquake Research and Information University of Memphis, TN
PhD candidate in Geophysics *Aug. 2015 – Present*
Advisor: Dr. Eunseo Choi
Thesis Title: *Understanding intraplate seismicity and lithospheric deformation in the Central Eastern US using numerical modeling and receiver functions*

Indian Institute of Technology Roorkee, India
Integrated Master and Bachelor of Technology in Geophysics *Aug. 2009 – Aug. 2014*
Advisor: Dr. Rambhatla G. Sastry
Thesis Title: *Non invasive hydraulic conductivity estimation using microgravity survey*

Current Research Experience

Intraplate seismicity and lithospheric deformation in the Central Eastern US

- Investigated earthquake generation in the New Madrid Seismic Zone and the Eastern Tennessee Seismic zone using 3D numerical models.
- Incorporated rheology based on the observed regional seismic tomography.
- Computed stress distribution using open source codes including PyLith and ASPECT.

Sp receiver functions in Central Eastern US

- Employed different stacking techniques in synthetic seismograms to best detect Sp phase at the lithosphere-asthenosphere boundary.
- Delineated lithosphere structures beneath the Mississippi Embayment using Sp receiver functions from all seismic stations in the region.

Non-localization of shear bands in plasticity

- Demonstrated dependence of shear bands orientation on the mesh resolution in finite element plastic and viscoplastic numerical models.
- Tested implicit gradient method in ASPECT that averages plastic strains over nearby finite elements to alleviate the mesh dependency.

Publications

- **Arushi Saxena**, Eunseo Choi, Christine Powell and Charles Langston (submitted). "Possible orthopyroxene enrichment in the upper mantle below the Mississippi Embayment" *Journal of Geophysical Research*
- **Arushi Saxena**, Eunseo Choi, Christine Powell and Khurram Aslam (in-review). "Stress concentration due to lithospheric drip on the seismicity in the Central and Southeastern US." *Journal of Geophysical Research*
- **Arushi Saxena** and Charles Langston (in-prep). "Detecting lithospheric discontinuities beneath the Mississippi Embayment using S wave receiver functions." *Bulletin of the Seismological Society of America*

- **Arushi Saxena**, Christine A. Powell and Eunseo Choi (in-prep), "Origin of a circular Pn anisotropy in the Mississippi Embayment. *Geophysical Research Letters*
- Yu Geng, Christine A. Powell and **Arushi Saxena** (in-review), "Joint local and teleseismic tomography in the central United States and implications for the origin of intraplate seismicity." *Journal of Geophysical Research*

Industry Experience

Junior Geophysicist Lagos, Nigeria
Sterling Energy and Oil *Aug., 2014 – June, 2015*
Seismic data interpretation and well tying using Petrel and Decision Space Desktop server.

Conference Presentations

- Detecting lithospheric discontinuities beneath the Mississippi Embayment using S wave receiver functions, *Eastern Section Seismological Society of America, 2019*
- Evolution of lithospheric drip and its impact on the seismicity in the Central and Southeastern US, *AGU Fall Meeting, 2018*
- Numerical modeling of slab-released Fluids in the New Madrid Seismic Zone, *AGU Fall Meeting, 2017*
- GeoTrust Hub: A Platform For Sharing And Reproducing Geoscience Applications, *AGU Fall Meeting, 2017*

Workshops Attended

- Ada Lovelace Workshop on Mantle Dynamics (2019) sponsored by CIG at Sienna, Italy
- Machine Learning Workshop (2019) at CERI
- XSEDE HPC workshop (2018) supported by CERI at Knoxville, TN
- ASPECT Hackathon (2018) sponsored by CIG at Walker Lake, California
- Coupling of Tectonic and Surface Processes workshop (2018) sponsored by CIG at Boulder, Colorado
- ASPECT Hackathon (2017), sponsored by CIG at Blue Ridge, Atlanta
- Analog modeling workshop (2017) sponsored by Organizers at Austin, Texas
- Crustal Deformation Modeling workshop (2017) sponsored by CIG at Golden, Colorado
- Broadband seismic stations deployment in wavefields experiment (2016) sponsored by IRIS at Oklahoma

Technical Skills

- **Programming**: Python (NumPy, SciPy, Pandas, Matplotlib), Matlab, C++, Shell scripts, High performance computing, Parallelized programming.
- **Softwares**: Eclipse, Paraview, ArcGIS, Petrel, SAC, GMT, InkScape, LaTex, Trelis.

Memberships and Honors

- AGU Fall Meeting Student travel grant awardee, 2017.
- Student Member of American Geophysical Union, 2017 - present.
- Student Representative for Academic Program Committee, 2017 - present.
- Student Member of Seismological Society of America, 2018 - present.

- Treasurer, Society for Exploration Geophysicist Student Chapter at the University of Memphis, 2016-2017.
- Treasurer, Earth Sciences at Indian Institute of Technology, Roorkee, 2012-2013.
- Graduate Aptitude Test in Engineering Scholarship awardee, India, 2013-2014.
- Summer Research Fellowship, Indian Academy of Sciences awardee, May 2011-July 2011.

References

- Dr. Eunseo Choi, Associate Professor, CERI, University of Memphis, echoi2@memphis.edu
- Dr. Charles Adam Langston, Director and Professor, CERI, University of Memphis, clangstn@memphis.edu
- Dr. John Naliboff, Assistant Research Scientist, CIG, University of California Davis, jbnaliboff@ucdavis.edu