

Ahmad Jan, Ph.D.

Phone: +1-865-274-2260

Skype: ajkhattak

Email: jana@ornl.gov

P. O. Box 2008, MS 6301

Building 4500N, F129-J

Oak Ridge, TN, 37831-6301, USA

SUMMARY

- A Computational Mathematician with PhD.
- Highly trained for developing/extending simulators for high performance scientific computing and modeling.
- Currently, a postdoctoral research associate at Climate Change Science Institute, Oak Ridge National Laboratory. Developing advanced multiphysics multiscale models to understand how a changing climate impacts the terrestrial water-cycle. Studying integrated surface/subsurface thermal hydrology.
- Research experience in subsurface characterization using Bayesian MCMC framework – model how CO₂ displaces brine in sand-stones.

EDUCATION

- **Ph.D. in Applied Mathematics** 2011 - 2015
University of Wyoming Wyoming, USA
Thesis: A Bayesian Framework for the Validation of Porous Media Flow Models at the Laboratory Scale
Advisors: Prof. Felipe Pereira and Prof. Myron Allen
- **M.S. in Computational Mathematics** 2005 - 2007
Ghulam Ishaq Khan Institute of Engineering Sciences & Technology KPK, Pakistan
Thesis: Nonlinear Partial Differential Equations and Meshless Radial Basis Functions Method
Advisor: Prof. S.I.A. Tirmizi
- **MSc in Applied Mathematics** 2007 - 2005
Quaid-i-Azam University Islamabad, Pakistan

EXPERIENCE

- **Postdoctoral Research Associate** Aug 2015 - Present
Oak Ridge National Laboratory Tennessee, USA
 - Developing a novel intermediate-scale model for the simulation of soil thermal hydrology in low-relief polygonal tundra – study permafrost degradation and responses of the temperature-sensitive Arctic ecosystems in warming climate. This computationally advantageous strategy bridges gap between fine-scale model and earth system model grid scale, enables to track thaw-induced subsidence and allows subcyclng different processes.
 - Developed a subgrid model to capture the effects of microtopographic features (depressions, obstructions) in the hyper-resolution models. Spatial variability in the surface elevation (microtopography) exists below the scale of a typical hyper-resolution grid cell and has significant effects on flow.
- **Project Assistant** Dec 2009 - May 2010
Technical University of Graz Graz, Austria
 - Worked on the implementation of adaptive method coupling, Translational brain power project Austrian National Science Fund
- **Research Associate** Aug 2007 - Nov 2009
Ghulam Ishaq Khan Institute of Engineering Sciences & Technology KPK, Pakistan
 - Involved in research activities and taught several courses to B.S. engineering students

TECHNICAL SKILLS

- **Modeling and Simulations**

- 6 years' experience in modeling and simulations of subsurface flows
- A developer of Advanced/Arctic Terrestrial Simulator (ATS) – [webpage](#)
- Developed Uncertainty Quantification (UQ) framework in the Compositional Simulator – [webpage](#)

- **Programming Languages**

- C/C++ Python Matlab

- **Visualization Tools**

- VisIt Paraview GLE

- **Version Control Tools**

- git Mercurial Subversion

- **Third Party Libraries – Scientific Tools**

- 2 years' experience in using third party libraries for scientific computing
- MPI

PUBLICATIONS

- **Published**

- **Ahmad Jan**, Ethan T. Coon, Scott L. Painter, Rao Garimela, David Moulten, An Intermediate-scale model for the simulation of soil thermal hydrology in low-relief polygonal landscapes. [Accepted for publication in Computational Geosciences]
- Akbarabadi, M., Borges, M., **Jan, A.**, Pereira, F., and Piri, M. On the Validation of a Compositional Model for the Simulation of CO₂ Injection into Saline Aquifers. *Transport in Porous Media*, (2017) 1-32. [Authors are listed alphabetically]
- Scott Painter, Nathan Collier, **Ahmad Jan**, Integrated Surface/subsurface flow modeling in PFLO-TRAN. ORNL/TM-2016/575. Oak Ridge National Laboratory (ORNL), Oak Ridge, TN (United States), (2016) [weblink](#)
- Akbarabadi, M., Borges, M., **Jan, A.**, Pereira, F. and Piri, M., A Bayesian framework for the validation of models for subsurface flows: synthetic experiments, *Computational Geosciences Vol 19*(2015), pp. 1231–1250. [Authors are listed alphabetically]
- **Ahmad Jan**, S.I.A. Tirmizi, Siraj-ul-Islam, Application of meshfree collocation method to a class of nonlinear partial differential equations, *Engineering Analysis with Boundary Elements Vol 33*(2009) pp. 661-667.
- **Ahmad Jan**, A computational meshless method for the generalized Burger's Huxley equation, *Applied mathematical modeling, Vol 33*(2009) pp. 3718-3729.
- **Ahmad Jan**, Siraj-ul-Islam, A comparative study of the numerical solution of a class of KdV equation, *Applied Mathematics & Computation Vol 199*(2008) pp. 425-434.
- Siraj-ul-Islam, **Ahmad Jan**, S.I.A. Tirmizi, A meshfree method for numerical solution of KdV equation, *Engineering Analysis with Boundary Elements Vol 32*(2008) pp. 849-855.

- **Submitted or In Progress**

- **Ahmad Jan**, Ethan T. Coon and Scott L. Painter, A Subgrid Approach for Modeling Microtopography Effects on Overland Flow [submitted to Water Resources Research]
- **Ahmad Jan**, Scott L. Painter and Ethan T. Coon, Simulting temporal and spatial evolution of taliks: From current climate to future temperature predictions [in progress]

AWARDS AND HONORS

- **Catherine Gibbs Shaw and Shanti Sehgal's award** : University of Wyoming, USA (2014)
Received the award for making consistent progress towards graduation; active participation in graduate students activities.
- **National Engineering and Scientific Commission (NESCOM) Excellence Award**
Ghulam Ishaq Khan Institute of Engineering Sciences & Technology, Pakistan (2007)
In the recognition of holding first position and scoring highest GPA during my M.S. in the Faculty of Engineering Sciences : Award goes to only one student in a batch.
- **Talent Farming Scheme Scholarship: Higher Education Commision**
Islamabad, Pakistan (2004)
Awarded to only 85 Math/Stat students by participating and securing high percentage in a national level test.

Conference Presentations

- Presented at the CFSF 2014 conference, Laramie WY, USA
- Presented at the 6th Interpore conference 2014, Milwaukee WI, USA
- Presented at the AGU 2016, San Francisco CA, USA
- Presented at the SIAM conference 2016, Boston MA, USA
- Presented at the ModFlow & More 2017, Golden CO, USA