Special Issue on Mathematical and Numerical Modeling of Flow and Transport

Call for Papers

Modeling of flow and transport is an essential component of many scientific and engineering applications, with increased interests in recent years. Application areas vary widely, and include groundwater contamination, carbon sequestration, air pollution, petroleum exploration and recovery, weather prediction, drug delivery, material design, chemical separation processes, and many others. However, accurate mathematical and numerical simulation of flow and transport remains a challenging topic from many aspects of physical modeling, numerical analysis and scientific computation. Mathematical models are usually expressed via nonlinear systems of partial differential equations, with possibly rough and discontinuous coefficients, whose solutions are often singular and discontinuous. An important step of a numerical solution procedure is to apply advanced discretization methods (e.g. finite elements, finite volumes, and finite differences) to the governing equations. Local mass conservation and compatibility of numerical schemes are often necessary to obtain physical meaningful solutions. Another important solution step is the design of fast and accurate solvers for the large-scale linear and nonlinear algebraic equation systems that result from discretization. Solution techniques of interest include multiscale algorithms, mesh adaptation, parallel algorithms and implementation, efficient splitting or decomposition schemes, and others. As an indispensable discipline in natural science and mathematics, **mathematical and numerical modeling of flow and transport** is of great attractions to researchers.

In this special issue, we invite front-line researchers and authors to submit original research and review articles that explore **mathematical and numerical modeling of flow and transport**. In this special issue, potential topics include, but are not limited to:

- Mathematical and numerical modeling in porous media
- Modeling, analysis, and simulation of multiphase multicomponent compositional flow
- Modeling, analysis, and simulation of flow and reactive transport
- Discretization based on advanced finite element, finite volume, or discontinuous Galerkin methods of flow and transport
- High performance computing for multiphase flows
- Numerical analysis of methods for flow and transport
- Mathematical modeling and analysis of flow and transport

Authors should read over the journal's Authors' Guidelines carefully before submission. Prospective authors should submit an electronic copy of their complete manuscript through the journal's Paper Submission System.

Please kindly note that the "**Special Issue**" under your manuscript title should be specified and the research field "**Special Issue - *Mathematical and Numerical Modeling of Flow and Transport***" should be selected during your submission.

Also please note the following timetable:

Submission Deadline	May 21st, 2015
Publication Date	July 2015

Guest Editor:

For further questions or inquiries
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