ESSIE

UF Engineering School of Sustainable Infrastructure & Environment

College of Engineering

UNIVERSITY of FLORIDA

ESSIE is sponsoring the 2012 Darcy Lecture on April 4th at 3 pm in Room 282 Reitz Union

2012 Darcy Lecturer

S. Majid Hassanizadeh

S. Majid Hassanizadeh, Ph.D., has been a professor of hydrogeology on the faculty of geosciences at Utrecht University since 2004 and is the senior adviser with the Soil and Groundwater Department of Deltares research institute. He earned his B.Sc. from Pahlavi University in Iran, and his M.E. and Ph.D. from Princeton University; all three degrees are in civil engineering. Hassanizadeh has worked at Abadan Institute of Technology and Yekom Consulting Engineers, both in Iran, and the National Institute of Public Health and Environment and Delft University of Technology in the Netherlands, the latter of which named him an Antoni van Leeuwenhoek professor in 2001-2003. He has also held visiting faculty positions at the University of Notre Dame; University of Bordeaux, France; EPF Lausanne, Switzerland; and Stuttgart University, Germany.

Hassanizadeh served as editor of *Advances in Water Resources* (1991-2001) and associate editor of both *Vadose Zone Journal* (2002-2009) and *Water Resources Research* (2004-2009). He is a member of the International Advisory Board of the *Journal of Hydrologic Engineering* (since 2004), and on the editorial boards of *Transport in Porous Media* (since 1989), *Journal of Porous Media Special* (since 2009), *Topics & Reviews in Porous Media* (since 2010), and *The Open Hydrology Journal* and *The Open Civil Engineering Journal* (the latter two since 2007). In addition, Hassanizadeh is active as a session organizer or a member of various committees for the Netherlands Royal Academy of Arts and Sciences, the Netherlands Organization for Scientific Research, American Geophysical Union, Soil Science Society of America, European Geophysical Union, and the International Association of Hydrological Sciences. He is a founding member and managing director of the International Society for Porous Media (InterPore). Hassanizadeh has published close to 200 times in journals, books, conference proceedings, and technical reports. He's cosupervised more than 35 graduate students, coorganized a large number of international conferences, workshops, and short courses, and he's given more than 50 invited/keynote lectures in international meetings. He is a Fellow of both the American Geophysical Union (2002) and American Association for Advancement of Science (2007). He was awarded the honorary degree of Doktor-Ingenieur from Stuttgart University in 2008 and received the von Humboldt prize in 2010.

Hassanizadeh's research focuses on flow and transport in porous media through theory development, experimental studies, and modeling work. His current research includes pore-network modeling and experimental studies of two-phase flow, pore-network modeling of adsorbing solutes in unsaturated soil, transport of colloids and microorganisms in variably saturated soil, and novel remediation methods for NAPL-polluted soils.

Seminar Topic

Transport of Viruses in Partially Saturated Soil and Groundwater

Surface water is often used for recharge of aquifers used in drinking water production. But it can be contaminated with pathogenic microorganisms and viruses from wastewater discharges or manure runoff. These pathogens have to be removed to produce safe drinking water such as passing surface water through soil. However, to assure production of safe drinking water from surface water, adequate travel times and travel distances are needed. In this regard, it is important to determine various factors that affect the rate of removal of pathogenic viruses during soil passage. These factors include hydraulic conditions (such as flow velocity and saturation) and geochemical conditions (pH, ionic strength, concentration of calcium). In this lecture, Hassanizadeh will:

- Present the results of a large number of laboratory and field experiments involving bacteriophages (viruses affecting bacteria), which were carried out under a variety of conditions under steady-state flow settings.
- Show how the data from the experiments was used to derive (empirical) relationships between removal rate coefficients and geochemical conditions as well as saturation.
- Explain how in the case of unsaturated flow, the role of air/water interfaces in the removal of viruses was also investigated.
- Present findings from experiments performed under transient flow conditions where saturation has been changed significantly.
- Show how the experiments, as well as other researchers' results, have demonstrated that both drainage and imbibition fronts cause a remobilization of adsorbed viruses.
- Discuss the mechanisms behind this remobilization.
- Provide evidence from pore-scale visualization experiments performed in a micromodel.

If you are interested in an opportunity to meet with Majid on Wednesday or Thursday contact Mike Annable (annable@ufl.edu or 392-3294)