

# Peter K. Kang

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## EDUCATION

**Massachusetts Institute of Technology (MIT)** Cambridge, MA, USA  
Candidate for Ph.D. in Civil and Environmental Engineering 2010 - 2014  
Thesis: Characterization and Stochastic Modeling of Anomalous Transport through Fracture Networks  
Advisor: R. Juanes GPA: 5.0/5.0  
M.S. in Civil and Environmental Engineering 2008 - 2010  
Thesis: Transport in Lattice Fracture Networks: Concentration Mean and Variance  
Advisor: R. Juanes GPA: 5.0/5.0  
**Seoul National University (SNU)** Seoul, South Korea  
Bachelor of Civil, Urban and Geosystem Engineering 2004 - 2008  
Graduated with Summa Cum Laude Overall GPA: 3.99/4.3, Major GPA: 4.09/4.3  
**The University of Auckland** Auckland, New Zealand  
Exchange Student 2007

## HONORS

Outstanding Student Paper Award from the American Geophysical Union (AGU) Fall meeting, 2011  
Community choice awards from MIT IDEAS / Global Challenge competition (\$5,000), 2011  
Project development grant from MIT IDEAS / Global Challenge competition (\$1,000), 2011  
Outstanding Student Paper Award from the American Geophysical Union (AGU) Fall meeting, 2010  
Department of Energy Office of Science Graduate Fellowship (DOE SCGF) award, 2010  
National Science Foundation Graduate Research Fellowship (NSF GRF) award, 2010 (declined)  
Top honor from graduating Civil, Urban and Geosystem Engineering Department at SNU, 2008  
Outstanding Paper from Korea Water Resource Corporation, 2007  
Outstanding Research from BK SIR technical competition in South Korea, 2007  
Outstanding Poster from BK SIR technical competition in South Korea, 2007  
Research Grant on Fusegate from the Center of Teaching and Learning at SNU (\$5,000), 2006  
Full undergraduate tuition scholarship from Korea Science and Engineering Foundation, 2004

## RESEARCH EXPERIENCE

**Massachusetts Institute of Technology (MIT)**, Cambridge, MA 2008 - Current  
Title: Graduate Research Assistant  
Supervisor: R. Juanes, Department of Civil and Environmental Engineering  
• Flow and transport through fracture networks (theory, numerical modeling, laboratory and field experiments)  
• Joint inversion of flow and geophysics data to characterize fractured media (theory, numerical modeling and laboratory experiments)  
**University of Rennes 1**, Rennes, France 2011 Summer, 2012 Summer  
Title: Visiting Research Assistant  
Faculty host: T. Le Borgne, O. Bour, Department of Geosciences  
• Multi-tracer transport experiment on fractured granite under ambient, single and cross-borehole pumping conditions to understand origins of anomalous transport through fractured media (field scale experiment and modeling).  
**Technical University of Catalonia**, Barcelona, Spain 2009 Summer, 2010 Summer  
Title: Visiting Research Assistant

Faculty host: M. Dentz, Department of Geosciences (IDAEA-CSIC)

- Anomalous transport through fracture networks with highly heterogeneous permeability field (theory and numerical modeling).

**NASA's Goddard Space Flight Center**, Greenbelt, Maryland

2007 Winter

Title: Undergraduate Research Assistant

Faculty host: William K.-M. Lau (Chief of the Laboratory for Atmospheres), The Laboratory for Atmospheres

- Investigated sources of aerosols over East Asia and their interaction with cloud and precipitation (modeling).

**The University of Auckland**, Auckland, New Zealand

2007 Fall

Title: Undergraduate Research Assistant

Faculty host: B. Melville, Hydraulics Laboratory

- Sediment transport and deposition in river systems (laboratory experiment).

**Seoul National University**, Seoul, South Korea

2006 - 2007

Title: Undergraduate Research Assistant

Faculty host: I. -W. Seo, Department of Civil, Urban and Geosystem Engineering

- Flow and pollutant dispersion in meandering channels (laboratory experiment).

**Seoul National University**, Seoul, South Korea

2006

Title: Principal investigator

Project funder: The Center of Teaching and Learning at Seoul National University

- Initiated and conducted research on effective spillway gate to enhance flood control capabilities of dams (laboratory experiment and numerical modeling).

## TEACHING EXPERIENCE

**Massachusetts Institute of Technology (MIT)**, Cambridge, MA

2013 Spring. Two lectures

Title: Class organizer and Teacher for Water and Sanitation Infrastructure in Developing Countries (1.851J)

- Taught two classes on groundwater issues in developing countries and the importance of understanding flow and transport through porous media.
- The lecture format and problem set supervised by Susan Murcott (senior lecturer in course 1).

**Massachusetts Institute of Technology (MIT)**, Cambridge, MA

2010 Spring, Fall

Title: Class organizer and Teacher for SPARK and SPLASH programs

- Physical experiment and numerical simulation of groundwater flow and its influence on global warming for 7th-12th graders (SPARK).
- Hydraulic fracturing and flow through fractures for 7th-12th graders (SPLASH).

## LEADERSHIP EXPERIENCE

**Project AQUA**, Dar es Salaam, Tanzania

2011 - current

Title: Project founder and leader

- Initiated an international development project and won project funds from MIT and Korea appropriate technology research center.
- Modified and installed biosand filter for the Kiwalani community in Tanzania and started sustainable neighborhood level water distribution service.

**International Centre for Theoretical Physics (ICTP)**, Trieste, Italy

2008 Summer

Title: Leader of a subgroup

- Participated Targeted Training Activity on seasonal predictability in tropical regions and workshop on multi-scale predictions of the Asian and African Summer Monsoon.
- Presented a proposal for the statistical downscaling scheme for the weather forecast.

**Triangulated Student Activity**, Taipei, Taiwan

2006 Summer

Title: Leader of a subgroup

- Participated student seminar activity with selected civil and environmental engineering students from National Taiwan University, Seoul National University and Tokyo University
- Participated as a leader of the water engineering group at Seoul National University.

**JOURNAL PUBLICATIONS**

- **P. K. Kang**, J. Song and S. U. Hong. An International Development Project Combining Appropriate Technology and Mobile Application: Proposal and Preliminary Field Work. *International Development and Cooperation Review*, 4(1), 89-119 (2012).
- **P. K. Kang**, M. Dentz, Tanguy Le Borgne and R. Juanes. Spatial Markov Model of Anomalous Transport Through Random Lattice Networks. *Physical Review Letters*, 107, 180602 (2011).
- **P. K. Kang**, M. Dentz and R. Juanes. Predictability of anomalous transport on lattice networks with quenched disorder. *Physical Review E*, 83(3), 030101(R) (2011).

**JOURNAL PUBLICATIONS in review**

- **P. K. Kang**, Tanguy Le Borgne, Olivier Bour, Tanguy Le Borgne and R. Juanes. Origin of Anomalous Transport through Fractured Media: Modeling and Observations from a Field Test in Fractured Granite.

**CONFERENCE PRESENTATIONS**

- **P. K. Kang**, T. Le Borgne, O. Bour, M. Dentz and R. Juanes. Anomalous transport in fracture networks: field scale experiments and modeling. American Geophysical Union (2012)
- **P. K. Kang**, T. Le Borgne, O. Bour, M. Dentz and R. Juanes. Upscaling Fractured Media to Heterogeneous Lattice Networks: Modeling and Observations from a Field Tracer Tests in Fractured Granite. Gordon Research Conference: Flow and Transport in Permeable Media (2012)
- **P. K. Kang**, Marco Dentz, Tanguy Le Borgne, Ruben Juanes. Macroscopic Modeling of Anomalous Transport on Heterogeneous Lattice Networks. Gordon Research Seminar: Flow and Transport in Permeable Media (2012) **Oral presentation.**
- **P. K. Kang**, Marco Dentz, Tanguy Le Borgne, Ruben Juanes. Macroscopic Modeling of Anomalous Transport on Heterogeneous Lattice Networks. Computational Methods in Water Resources (2012). **Oral presentation.**
- **P. K. Kang**, T. Le Borgne, O. Bour, M. Dentz and R. Juanes. Origin of Anomalous Transport through Fractured Media: Modeling and Observations from a Field Test in Fractured Granite. American Geophysical Union (2011) **Oral presentation. OSPA award received.**
- C. Nicolaidis, **P. K. Kang**, L. Cueto-Felgueroso, M. Dentz, and R. Juanes. Disease Spreading in Lattice Networks with Flux Disorder. American Geophysical Union (2011)
- **P. K. Kang**, M. Dentz and R. Juanes. Effective Transport in Lattice Fracture Networks with Uncorrelated and Correlated Velocity Field. American Geophysical Union (2010). **OSPA award received.**
- **P. K. Kang**, M. Dentz and R. Juanes. Effective Solute Transport with Linear Sorption in Lattice Fracture Networks. Computational Methods in Water Resources (2010). Oral presentation.
- **P. K. Kang**, M. Dentz and R. Juanes, Effective Transport in Fracture Networks: Concentration Mean and Variance. American Geophysical Union (2009).
- **P. K. Kang**, I. O. Jun, I. W. Seo and S. W. Park. A study on applicability of Fusegate as a flood control gate of dam and levee. Korea Water Resource Corporation (2007).

**PROFESSIONAL SOCIETIES**

American Geophysical Union, member