Environmental Engineering at USC Viterbi
Hello

Located in Los Angeles, a global center for technology, arts and international business; USC Viterbi fosters world-class research and practical innovation.

The USC Viterbi School of Engineering is internationally recognized for creating new models of education, research and commercialization that are firmly rooted in real world needs. The School’s first priorities are the education of outstanding students and the pursuit and publication of new research.

As the School’s faculty and students extend the frontiers of engineering knowledge through their research, they also apply engineering and technology to address societal challenges. The School stimulates and encourages qualities of scholarship, leadership, ambition and character that mark the true academic and professional engineer — to serve California, the nation and the world.
Why Choose the Sonny Astani Department of Civil and Environmental Engineering?

The Environmental Engineering program in the Sonny Astani Department of Civil and Environmental Engineering at USC comprises a unique team of faculty members who work collaboratively in research areas highly relevant to the dynamic field of environmental engineering.

Our faculty addresses water, air, and energy challenges that face urban and natural environments. Our unique undergraduate and graduate programs lead to BS, MS, and PhD degrees in engineering.

We have built new laboratories and designed a new curriculum; our world-class program of integrated research and education is rapidly evolving.

We seek to develop students into engineers who can solve community, regional, and national challenges.

Our faculty collaborate closely with industrial and utility partners in Southern California, across the nation, and around the world.

Ph.D Programs

- Water Reuse and Desalination Technologies
- Resource Recovery from Waste Streams
- Environmental Chemistry
- Contaminant Transport and Aquifer Remediation
- Sustainable Energy
- Urban Climate and Air Pollution
Dr. Childress’ research team carries out projects on membrane processes for innovative solutions to contaminant and energy challenges; pressure-driven membrane processes as industry standards for desalination and water reuse; membrane bioreactor technology; and colloidal and interfacial aspects of physiochemical processes.

Selected Publications


George Ban-Weiss
Assistant Professor

Climate change and urban air pollution are two of society’s great challenges. Dr. Ban-Weiss investigates how climate, air quality, and land cover interact from urban to global scales. His team also investigate practical solutions for mitigating climate change and air pollution in urban areas.

Selected Publications


Education

Ph.D. | University of California, Berkeley | 2008

Research

Urban climate and air pollution
Solutions for countering urban warming and air pollution
Global climate change
Land-atmosphere interactions
Climate modeling, air pollutant measurements, and satellite observations

Contact

banweiss@usc.edu | www-bcf.usc.edu/~banweiss

Honors & Awards

2014  Rose Hills Foundation Research Fellowship
2014  Charles Lee Powell Foundation Research Award
2016  Member of Development Team that won R&D 100 Award
Kelly Sanders
Assistant Professor | Dr. Teh Fu Yen Early Career Chair

Dr. Kelly Sanders’ research aims to ease tensions between human and natural systems. Specifically, her research team uses system-scale analysis to develop frameworks to reduce the environmental impacts of providing energy, water, and food services and identify opportunities to leverage the interdependencies between these critical resource systems to achieve efficiencies.

Honors & Awards
- 2017: Selected to participate in the 2017 National Academy of Engineering Frontiers of Engineering program
- 2016: MIT Technology Review’s 35 Innovators Under 35
- 2016: Orange County Engineering Council Outstanding Educator Award

Selected Publications

Contact
ktsanders@usc.edu | s3research.usc.edu

Education
Ph.D. | University of Texas, Austin | 2013

Forbes 30 under 30 in Energy

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Forbes 30 under 30 in Energy
We need to reconceptualize our waste streams as a resource of energy, nutrients, and water.

Dr. Smith uses advanced chemical, molecular, and bioinformatics tools to develop new and emerging biotechnologies to improve water infrastructure. He investigates anaerobic membrane bioreactors for energy recovery and production of reuse quality water during domestic wastewater treatment.

Education
Ph.D. | University of Michigan | 2014

Selected Publications


Contact
smithada@usc.edu | smithresearchusc.com

Adam Smith
Assistant Professor

Dr. Smith’s research team explores microbially-driven engineered processes for water management with an emphasis on resource recovery from waste streams.
Daniel McCurry
Assistant Professor

Dr. McCurry’s research applies the tools of organic and analytical chemistry to solve environmental problems. His research team primarily works in the areas of wastewater reuse and drinking water treatment. Specific projects include identifying and minimizing trace carcinogens during wastewater reuse, and expanding the disinfectant portfolio for water treatment.

Honors & Awards
2017 Editor’s Choice Paper in Environmental Science: Water Research and Technology
2017 Outstanding Reviewer for Environmental Science: Water Research and Technology
2012-2015 NSF Graduate Research Fellowship

Selected Publications


Our research focuses on identifying the chemical precursors and formation mechanisms of priority DBPs.
We aim to create computationally efficient, theoretically sound and accurate predictions of solute transport behavior in environmental flows.

The research carried out by Dr. de Barros’ team includes: (1) developing computationally efficient and novel semi-analytical solutions for partial differential equations describing flow and transport in porous media and rivers and (2) improving fundamental understanding of solute dispersion in porous materials.

Felipe de Barros
Assistant Professor

Dr. de Barros’ research develops task-driven, application-oriented, integrated models for simulating, optimizing, and predicting flow and transport in hydrogeological systems. His research lies on the interface between environmental engineering, hydrology, and environmental fluid mechanics.

Selected Publications


Constantinos Sioutas
Fred Champion Professor of Civil and Environmental Engineering

Dr. Sioutas’ research team works to investigate the underlying mechanisms that produce the health effects associated with exposure to air pollutants generated by a variety of combustion sources, such as traffic, harbor, and airport operations, power plants, and photo-chemically induced atmospheric reactions.

Honors & Awards
2014 David Sinclair Award, American Association for Aerosol Research
2012 Top cited article 2011-2012, Atmospheric Environment
2001-Present Member of the Air Quality Advisory Committee of the State of California on Particulate Matter

Selected Publications

Best Publication in Atmospheric Environment - Haagen-Smit Prize (2011)

Dr. Sioutas’ team has developed several state-of-the-art particle sampling technologies that have enabled the assessment of the relative toxicity of particulate pollution sources using, for the first time in the literature, realistic atmospheres in in vivo and in vitro studies in multimillion-dollar research centers funded by the US EPA, NIH, and CARB in Southern California. Several of these technologies are also being used by agencies such as the US EPA, as well as a host of international institutes in Europe and Asia.
Dr. Pirbazari’s main research interest is bio-physicochemical processes for drinking water treatment. He is currently conducting research on bio-membrane technologies for water reclamation and reuse. He is also investigating “Plant-Sediment Microbial Fuel Cell” processes for treatment of industrial wastewaters with simultaneous power generation for energy sustainability.

Selected Publications

Honors & Awards
1981 Academic Achievement Award, First Place among Doctoral Dissertations, American Water Works Association
1979 First Place Award, Biological Sciences Exhibition, Annual Meeting of Micro-Beam Analysis Society

Selected Publications
Affiliated Faculty

The Sonny Astani Department of Civil and Environmental Engineering has 24 tenured/tenure track faculty members and four professors of practice. Three of our faculty members hold early career chairs and three hold chaired professorships. Eleven faculty members are Young Investigator or Early Career awardees, and many are fellows of professional organizations.

Lucio Soibelman
“Our first priorities are the education of outstanding students and the pursuit and publication of new research.”

Qiming Wang
Prof. Wang’s expertise is in integrating additive manufacturing innovations with fundamental mechanics to address engineering sustainability challenges from improved infrastructure to clean water. His recent research projects are focused on three themes: additive manufacturing of extreme materials at their theoretical limits, autonomously self-repairing materials and structures, and fouling management for water membranes.

Roger Ghanem
Prof. Ghanem expertise is in the area of probabilistic modeling and risk assessment. A current focus of his research is on the development of inference and design algorithms for problems involving multiscale and multi-physics interactions with application to automotive, aerospace, and environmental engineering problems. Additional current interest include data driven methods for problems with poorly understood or highly complex physics.

Patrick Lynett
Prof. Lynett’s research interests are directed towards a better understanding of coastal processes, such as nearshore circulations, wave evolution from generation to the shoreline, multi-scale hydrodynamic interactions, and sediment transport. Investigations combine numerical modeling with both controlled experiments and field observations. Short time-scale coastal hazards, such as hurricanes and tsunamis, are of particular interest.

Mitul Luhar
Prof. Luhar is an Assistant Professor in the Department of Aerospace and Mechanical Engineering at USC. His research interests include environmental fluid mechanics, turbulence, and flow-structure interaction. His research team focuses on turbulent flow interacting with complex surfaces and interaction between flow and flexible structures.

Burcin Becerik-Gerber
Prof. Becerik-Gerber is the founding director of the Innovation in Integrated Informatics Lab. Her research falls at the intersection of built environment, machine intelligence, and socio-technological systems. Specifically, her work focuses on acquisition, modeling, and analysis of the data needed for user-centered built environments, and the development of novel frameworks and visualization techniques to improve built-environment efficiency, sustainability, and resiliency while increasing user satisfaction.

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