JOHN A. REIF, JR. DEPARTMENT OF
CIVIL AND ENVIRONMENTAL ENGINEERING

NJIT New Jersey Institute of Technology

Winter 2018 eNewsletter

Message from the Chair

Dear Friends of Civil & Environmental Engineering,

While our nation is facing infrastructure, technological, economic and political challenges, the students, staff, faculty, alumni and industrial advisory board of the **John A. Reif, Jr. Department of Civil and Environmental Engineering** (CEE) have been busy implementing strategic initiatives that continue to elevate our department and NJIT to greater excellence.

It gives me great pride to report that in a recently updated 2017 rankings report by ***College Factual*****,** NJIT's civil engineering program was ranked #5 of 211 programs nationwide and #1 in New Jersey. This places the civil engineering program at NJIT in the top 5 percent of CEE programs in the United States. **More**

To begin the new year, let me first touch upon the retirements of two of our distinguished faculty, **Professors Robert Dresnack** and **John Schuring**, who joined CEE in 1966 and 1982, respectively. On behalf of the CEE family, I would like to extend our best wishes and deepest gratitude to them for decades of enduring impact on the department and generations of alumni. They have been dedicated master teachers, mentors, scholars and servicemen who have made the department what it is today. We wish them a healthy and happy retirement. They will be dearly missed.

This past fall semester, CEE welcomed **Dr. Lucia Rodriguez-Friere** to the family as **Assistant Professor** in **Environmental Engineering**. **Dr. Rodriguez-Freire** comes to NJIT from the University of New Mexico, where she was a **postdoctoral research fellow** investigating the

transport, deposition and interaction of metals and radionuclides in the environment. Her research goals are to harness the interaction between biological and inorganic systems to solve environmental challenges, such as environmental pollution, the deterioration of ecosystems and resource depletion. We also welcomed **Nasser Channaoui** this past semester to the CEE family as **Director of Labs** for **Research**. **Mr. Channaoui** has more than 20 years of experience in electromechanical operations and facilities maintenance and upgrades. He will help support CEE's growing research laboratory and infrastructure needs.

While NJIT is constantly changing and improving, one thing that remains the same is our exceptional and dedicated faculty in CEE who work with our outstanding students on academic, research and service activities. Our award-winning **ASCE Steel Bridge Team** began fabricating the 2018 steel bridge for this year's competitions. Under the leadership of team faculty advisor **Professor Matthew Bandelt**, the team is incorporating innovative designs of unique T-slot and double-shear connections into a bridge with significant structural stiffness to reduce deflections during load testing.

Last semester, students from **Professor John Schuring's** hydraulics laboratory class in our **Bachelor of Science in Civil Engineering Program**, offered at **Mercer County Community College** campus since the Fall 2017 semester, put together an experiment they designed that is based on Bernoulli's Principle to demonstrate blood circulation in the human body.

Our team in the **Intelligent Transportation Systems Resource Center (ITSRC)**, under the leadership of **Professor Lazar Spasovic,** is performing cutting-edge research into intelligent transportation technologies, while deploying and testing them within our transportation networks. The team is, for example, working on **connected and automated vehicle (CAV) technology** designed to fundamentally transform the mobility, safety and environmental sustainability of roads and highways. This technology includes test beds in and around the cities of Camden and Newark and the installation of various traffic sensors and communication devices. In tandem with the instrumentation of test beds, the ITSRC is adding two new Ford Fusion hybrid cars that will be customized by our undergraduate and graduate students with CAV sensors and communication systems. The cars will be used to develop "Smart City" solutions to help people move more quickly, cheaply and reliably. The Center will study the vehicle interactions with the roadside devices, as well as other vehicles. The Center's "Smart City" research will also advocate for more livable and sustainable cities that will benefit residents, city authorities, local companies and industry. This and other projects in our **intelligent transportation, resilient infrastructure and environmental systems** research areas continue to make a positive impact on society.

I invite you to read this newsletter to learn about some of the recent accomplishments and activities of our students, staff and faculty. As always, I sincerely appreciate and welcome your support to our Department's academic and community service programs and initiatives.

Sincerely,

Taha F. Marhaba, P.E., F.ASCE
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(973) 596-5790 fax
Marhaba@njit.edu

Celebrating 50 Years of Service

At the **NJIT Service Award Ceremony** on **May 12, 2017, Robert Dresnack** was presented with a **Certificate of Recognition** from **President Joel S. Bloom**, marking his **50 years of service.**

Read about **Professor Dresnack's** career and milestones during his tenure with the **Department of Civil and Environmental Engineering,** which began on **September 1, 1966.**

Pictured from left: Professor Robert Dresnack and President Joel Bloom

The John A. Reif, Jr. Department of Civil and Environmental Engineering cordially invites you to join us in celebrating

The Retirements of Robert Dresnack and John Schuring

February 1, 2018 at 4 p.m. - NJIT Campus Center Atrium

Contribution: $40.00 per person - RSVP: cee@njit.edu

Stay tuned for Professor Schuring's farewell interview in the next CEE newsletter

In This Issue

Events

February 1, 2018
Robert Dresnack and John Schuring Retirement Party

May 5, 2018
Regional Steel Bridge Competition at NJIT

Students

NJIT Steel Bridge

The aim of this program is to prompt team members to take on leadership roles once they have the necessary technical skill set.

This year's captains have put an emphasis on getting younger members involved in the design fabrication process. Freshmen and sophomore students now have an opportunity to participate in a "**Design Bootcamp**" to learn the intricacies of the bridge design competition early in their academic career.

The team recently finished the structural design of the bridge, and will begin fabrication in early 2018. The team will focus on developing a bridge with significant structural stiffness to reduce deflections

Where are they now?

Drew McCaskey '72 retired from the Delaware Transit Corporation (DART).

Rob Foley '87 was promoted to associate at Dewberry's.

Manuel Da Silva '93, vice president for construction operations at the New Jersey Development Authority, was honored with a Star of Essex award.

Jason Pancoast '13 joined P.W. Grosser Consulting as a project manager in the environmental unit.

Alumni Updates

Scholarship Donations

The **Civil and Environmental Industrial Advisory Board (IAB)** has created an annual scholarship fund to assist CEE undergraduate students in preparing for professional licensure. The fund reimburses testing fees to students who pass the Fundamentals of Engineering exam.

Thank you for your generous support of this program.

DONATE NOW

2017 Scholarships

CEE Campaign
Aswina Ranasinghe
William Sanchez

Meet the 2018 Steel Bridge captains
From left: Aliyar Kasumov,
Rocco Cioffi and Francesca Arias

The NJIT **Steel Bridge Team** is comprised of undergraduate civil engineering students who work together through three phases: design and testing, fabrication, and competitive assembly against teams from other schools on both the regional and national levels.

during load testing. Unique T-slot and double shear connections will be incorporated into the final design.

View Civil Students building the bridge

Bernoulli's Principal

Students from the NJIT **Hydraulic Engineering Laboratory,** a junior-level course, put together an experiment they designed based on the **Bernoulli Principle** ***(Wikipedia)***. This principle in fluid dynamics is the key for designing all water supply systems. It explains why airplanes fly and blood circulates through the body.

The students named their experimental creation "**Danny**" in honor of **Daniel Bernoulli,** who discovered the principle in 1732.

CEE IAB
Joseph Angeli
Marc Coimbra
Patrick DeLong
Shaun Delaney
James Dietze
Daniel Fryer
Michael Gambardella
Gabrielle Grompone
Connor Hughes
Kevin Laforteza
Christopher Menge
Tuan Nguyen
Onashile Obagbemileke
Andres Osorio-Sanders
Stefanie Pacifico
Lahiru Pathirage
Rebieann Reyes
Mark Ulinski

Cassera Family
Daniel Cirasa

Gallagher Memorial
Joshua Loterena

GZA GeoEnvironmental
Brandon Lapeyre

Jenny Endowed
Catherine Simpson

Kulhawy '64, '66
Justin Khalawan

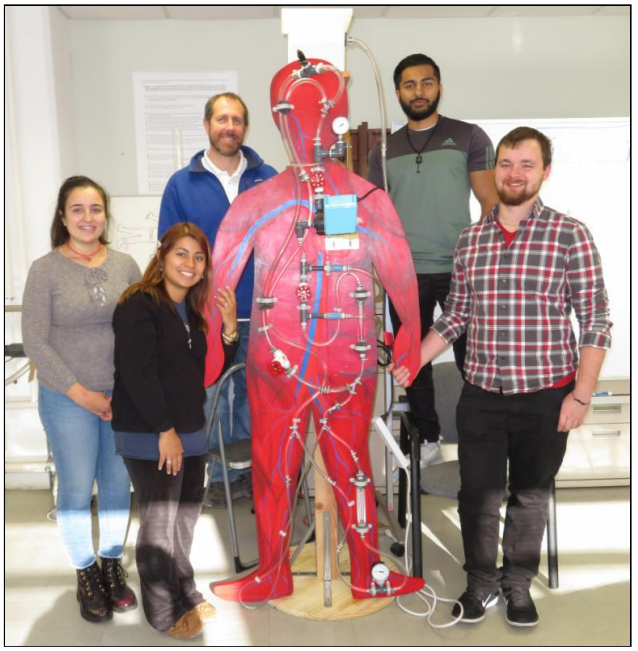
Robert Medina '74
Gabriel Garcia

MOLES
Whittier Hua
Ankur Patel

Papanicolau
Peter O'Connor

Quasi Construction
Alessandro Sestito

John. A Reif, Jr.
Cesar Alvarado
Fatima Gamalel-Din
Tiaja Harley
Johanna Khemraj



From left: Dana Channaoui, Katia Granados Keith Woods, "Danny", Ali Baig and Nathaniel Bourdeau

"I congratulate this student group in designing and building a superior experiment. The best part was how they overcame various challenges to convert a fun idea into a real working engineering model," said **Professor John Schuring**, the course instructor.

This laboratory section was offered through NJIT's **BSCE program** at **Mercer County Community College.**

Ahmed Khaled Abdella, Ph.D. Student

What led you to study at NJIT?
I like the approach that NJIT takes to environmental engineering. The great reputation of the program encouraged me not to go anywhere else. I thought it was the best choice for my career.

What project are you working on for your doctoral dissertation?
The formation, characterization and environmental applications of nanobubbles as a clean technology for water purification. I chose this research as it is clean, green and a sustainable technology, a requirement of today's American Society of Civil Engineers Code of Ethics.

What impact has your research work had in environmental engineering?
Among others, I am fortunate to be in a position to help advance the technology for the benefit of society. Organizing water laboratories for students has helped me understand their interest in treatment. Water treatment without harmful chemicals is essential for human health and the environment. My target is to help develop simple, cheap, eco-friendly and safe technologies to purify water for all parts of the world.

Has your research been published?
I co-wrote an article with Taha Marhaba, chair of the NJIT Department of Civil and Environmental Engineering,

Ismael Mercado
Richard Peters
Isaac Rodriguez
Marcos Sosa
Dileyanne Spezio

Turner Construction
James Dietze
Calvin Gould
Naveen Kamath
Candice Leung
Timothy O'Donnell
Connor McVey
Christopher Siwczak

Turner Construction Management
Joseph Angeli
Arzu Alimjan
Clara Basanti
Ali Fardos
Aliyar Kasumov

Advisory Board

Representing a diverse cross section of civil and environmental engineering professionals, including design consultants, construction managers, contractors and attorneys.

Jerome F. Gallagher, Jr., Esq. '80 (Chair) Norris, McLaughlin, Marcus, PA

Ted Cassera, P.E., '72 Bowman Consulting

Anthony Castillo, P.E., '95 '02 SESI Consulting Engineers

David Good, P.E., '78, '92 Mueser Rutledge Consulting Engineers

Andre Grebenstein, LEED AP '95, The Martin Group

Tony DeJohn, P.E., P.P. WSP Parsons Brinckerhoff

Gareth Middleton, P.E., '93 '04 Tishman Construction, an AECOM Company

Rocco Palmieri, P.E, P.P., PLS '72, '77, Partner Engineering

Ahmed A. K. A., & Marhaba, T. F. (2017), "Review on riverbank filtration as an in situ water treatment process", Clean Technologies and Environmental Policy," 19(2), 349-359.

Another article, written in partnership with CEE team members, is pending publication: Ahmed Khaled Abdella Ahmed, Cuizhen Sun, Likun Hua, Zhibin Zhang, Yanhao Zhang, Taha Marhaba, Wen Zhang. (In press, 2018), "Colloidal Properties of Air, Oxygen, and Nitrogen Nanobubbles in Water: Effects of Ionic Strength, Natural Organic Matters, and Surfactants", Environmental Engineering Science.

Since your graduation is approaching, what are your plans for the future?
Upon completion of my dissertation, I will pursue a postdoc position and prepare myself to follow an academic path towards a tenured professorship.

Research

Scour Research Project

The NJIT **Scour Research Project** recently achieved an important milestone. The team's newly developed method of scour analysis, known as the **Scour Evaluation Model (SEM),** was recently approved by the **Federal Highway Administration (FHWA)** and **New Jersey Department of Transportation (NJDOT)** for application analysis to bridges throughout the State of New Jersey. The approval followed a 14-month-long "**Implementation Phase**," during which full **SEM** evaluations were performed on 19 scour critical bridges across the State.

Bridge scour is the result of erosive action by running water, which excavates and carries away material from the bed and bank of a stream.

The **SEM** model launch was performed by three New Jersey consulting firms working in cooperation with the **NJIT Scour Research Team (led by Robert Dresnack and John Schuring**). The firms include **AECOM of Piscataway, McCormick Taylor of Mount Laurel** and **Mott McDonald of Iselin.**

Read details about **Scour Project,** including reports and presentations from **NJIT** and **NJDOT.**

and Science

Maurice Rached, P.E.
Maser Consulting

Ken Sisk, P.E., '95
Pizzarotti IBC

Joseph Stanley, P.E., P.P., '78, '85, Mott MacDonald

Wei Wang, P.E., '95
Urban Tech

Michael Wright, P.E., P.P., PMP '79 Arora and Associates, P.C.

Editors

Cynthia Gincel
Tom Jaworski
Tracey Regan
Heidi Young

Special Thanks

Strategic Communications
Office of Alumni Relations
Faculty/Staff, Students & Alumni

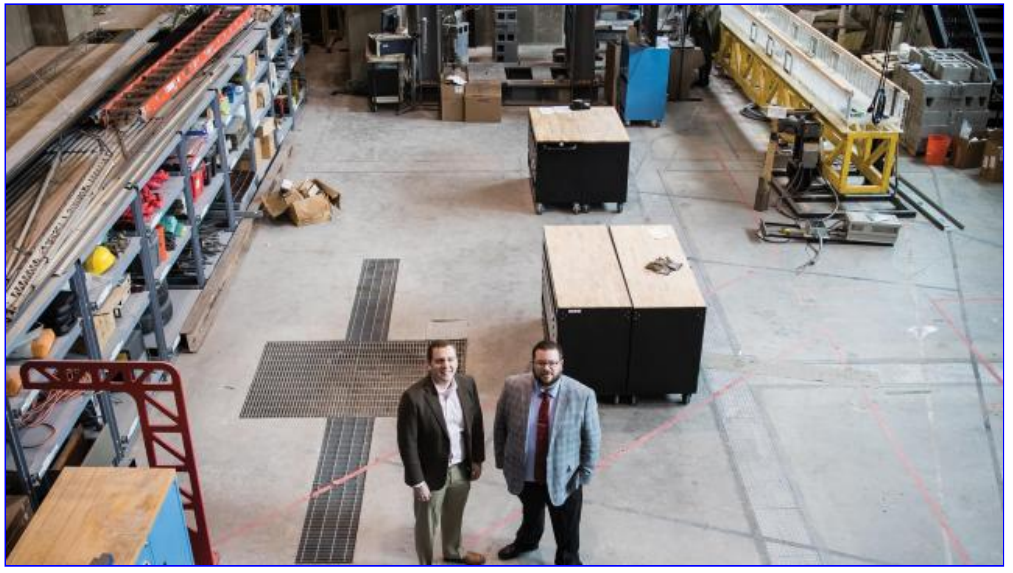
Reversing Mining's Toxic Legacy on Tribal Lands

When a federal inspection team inadvertently released three million gallons of heavy metal-laden waste from a century-old, defunct gold mine near Silverton, Colorado into the Animas River, **Lucia Rodriguez-Freire** was one of the first responders on the scene.

"The gold plume was crossing the border from Colorado to New Mexico the day I started my new position as a **postdoc researcher** at the **University of New Mexico**," **Rodriguez-Freire**, an assistant professor of civil and environmental engineering, said of the 2015 spill, which famously turned the river gold.

"We knew we needed to react immediately: to analyze the metal content in the water and sediments and to assess the movement of contaminants from the spill site to downstream in the river." **More**

Developing Infrastructure to Last More Than a Century



Rethinking the material building blocks of civilization - the asphalt, concrete and steel that compose roads, bridges and tunnels - now requires an added dimension: the ability to make durability projections not just for the standard 50 to 75 years of service life, but into a future in which climate change has made performance dynamic and unpredictable, notes **Matthew Adams**, assistant professor of civil engineering.

Some larger projects, such as hydroelectric power dams or iconic bridges, are expected to last up to 150 years, despite growing uncertainty over what environmental conditions those years may bring. Adams has joined forces with **Matthew Bandelt**, an assistant professor of civil engineering, to attack the problem on two fronts. **More**

Tapping the Earth's Warmth for Renewable Energy

From left: Bruno Goncalves da Silva and Aristides Chavez fabricating at the new NJIT Makerspace

There is a potentially limitless supply of renewable, carbon-free energy within the Earth's crust could we only permeate the thick layers of crystalline rock that sit over it, barring access. So far, success in harnessing the Earth's own heat has been mostly limited to tapping the boiling hot water that bubbles up with little prompting close to the surface.

"The main challenge is to tap into deeper and less fractured hot rocks. This would make geothermal energy accessible in many more locations across the world. In order to achieve this goal, we need to fracture the

rock in order to increase its permeability," says **Bruno Goncalves da Silva**, an assistant professor of civil and environmental engineering who, as a doctoral student at MIT, worked with a team of researchers who contend the U.S. alone could produce 100,000 megawatts of power within the next 50 years from what is called Enhanced Geothermal Systems. **More**

Alumni

Paul A. Sarlo receives Lifetime Achievement Award

From left: James F. Stevenson, Paul A. Sarlo '92 95; Raymond Cassetta '70; President Joel S. Bloom; Edward J. Schmeltz '71; Brian Kiernan '70 and Al Frungillo

Celebration 2017, an annual fundraiser for campus-wide scholarship endowment funds, was held on **November 10** at the **Pleasantdale Chateau** in **West Orange**. "The event, a festive evening of dinner and dancing, traditionally attracts approximately 300 attendees including senior executives, outstanding alumni and friends of the university," said **Jacquelynn Rhodes, associate vice president** for **development at NJIT.** " Along with raising funds, Celebration also is an occasion to recognize important friends and graduates of the university." At this year's event, **Paul A. Sarlo, Deputy Majority Leader of the New Jersey Senate** was awarded the **President's Medal for Lifetime Achievement**. **Sarlo** holds Bachelor of Science and Master of Science degrees in civil engineering from New Jersey Institute of Technology. **Celebration 2017 Article**

Faculty and Staff

Meet our new faculty member

It is with pleasure that we welcomed **Lucia Rodriguez-Freire** as an **assistant professor** in the fall of 2017. Lucia's lab investigates the mechanisms of interaction between biological and inorganic systems to:

(1) examine the effect of contaminants on natural biogeochemical cycles in order to predict, avoid and remediate current and future pollution

(2) engineer highly efficient and sustainable resource-recovery technologies from agricultural, industrial and mining waste

(3) design state-of-the-art wastewater treatment systems to remove persistent contaminants in the environment using ubiquitous and inexpensive materials....**More**

Meet our new staff member

It is with pleasure that we welcomed **Nasser Channaoui** as our new **Director of Labs** for research in fall of 2017. He has a B.S in **mechanical engineering** from **Mississippi State University.**

Nasser tests lab instruments and researches parts, functionality and the mechanics of lab equipment. He diagnoses and repairs instruments and maintains inventories of major and minor equipment.

Along with **Steve George,** the **Director of Labs** for education, **Nasser** schedules and executes preventative maintenance and calibration of major equipment to ensure it is operating optimally.

If not in their office, **Nasser** and **Steve** can be found in the concrete lab helping students.

Nasser has over 20 years of experience in electromechanical systems operations, maintenance and upgrades, including HVAC. He worked for **Johnson Controls, Inc**. and **Lennox International** and was instrumental in troubleshooting and resolving equipment malfunctions for numerous clients in New Jersey, New York and Vermont.

Convocation 2017 Award Winners

CEE team members were honored at **Convocation 2017** at the newly built **NJIT Wellness and Events Center** on **September 27**. **Convocation** is an annual celebration and awards ceremony that marks the start of the academic year recognizing the accomplishments of students, faculty and staff.

Excellence in Instruction
Janitha Hewa Bathagoda, teaching assistant, geotechnical

Excellence in Instruction
John Lyssikatos, adjunct professor, construction management

Excellence in Service
Heidi Young, assistant to the chair for administration

CEE Newsletters

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