



Drexel Hosts National AEI Student Conference

Drexel University will be hosting the 2014 Architectural Engineering Institute (AEI) National Student Conference on March 27-29, 2014 in the Papadakis Integrated Sciences Building. Students from across the country will gather to discuss recent advancements in the Architectural Engineering industry. The focus of this year's conference is high rise design and will consist of presentations about Building Information Modeling (BIM), Seismic Design, and Innovative Building Materials, to name a few. Drexel's CAEE Department will have an opportunity to promote its new Digital Building BS concentration as well as the Architectural Engineering graduate program that will start in the 2014-2015 academic year.

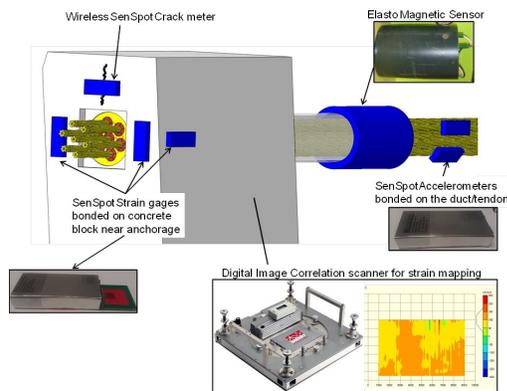


DREXEL UNIVERSITY
**ARCHITECTURAL
ENGINEERING
INSTITUTE**

The ASCE Charles Pankow Annual Architectural Engineering Student Competition will also take place at this conference. This year's competition addresses the design, integration, and construction issues that must be considered for a new high profile 30 story high rise office building located in San Francisco. Drexel teams have traditionally performed very well in this competition and students are looking forward to another successful year.

Conference planning is being led by Drexel AEI Chapter President and CAEE senior **Nathan Barry**. Assisting him with these logistics are Drexel students **Charlie Stillwell**, **Tyler Devilbiss**, **Michael Sawin**, **Jalpesh Patel**, and **Karan Sagar Sinha** along with the guidance of **Professor James Mitchell**, faculty advisor and director of the Architectural Engineering program at Drexel. Students are encouraged to attend the conference and volunteers will be needed. For more information please visit drexel.aeistudents.org or email dsoaei@drexel.edu

FHWA Award



Dr. Ivan Bartoli (PI) and **Drs. Frank Moon** and **A. Emin Aktan (co-PIs)** were recently awarded an FHWA grant in the amount of \$750,000 over a period of 3 years. This project is titled [Low-Powered Wired Sensors for Asset Management or Health Monitoring of Structures and Pavements](#). This award will focus on the design, development and validation of a revolutionary suite of wireless multipurpose sensors for the health monitoring of transportation infrastructures. These sensors are unique because they are easy to install, maintenance free, low-cost, can withstand strong elements, and have a service life exceeding 30 years. The sensors, referred to as SenSpot, will be able to measure a wide variety of quantities such as strain, acceleration, tilt, temperature, humidity. The wireless sensing system will also include a communication gateway for sending sensor data to a server and a dedicated software package to perform data analysis.

Envisioned monitoring of tendons in post-tensioned bridge using wireless SenSpot sensors. Comparison with state of the art wired sensors such as accelerometers, strain gages, Digital Image Correlation scanners, and correlation with tendon prestress forces measured by Elasto Magnetic sensors.

Current Research in Energy and the Environment

Drs. Anu Pradhan (PI) and **Sabrina Spatari (co-PI)** have received a recent grant award of \$42,000 to establish the NewBio Data Management project. This project will support the USDA Agriculture and Food Research Initiative (AFRI) CAP grant awarded to Penn State University and collaborators who have established the NewBio (Northeast Woody/Warm-season Biomass) Consortium. Drexel University is part of this collaboration. This consortium is an effort amongst stakeholders to focus on developing woody and perennial grass biomass resources on marginal land in the US Northeast for developing biofuel markets. Dr. Pradhan is leading the effort to develop data management ontologies for the project. Doctoral student **Kimberlee Marcellus** will create the data management design plan. Project deliverables will consist of a data management protocol document as well as findings exhibited in the form of presentations and manuscripts.



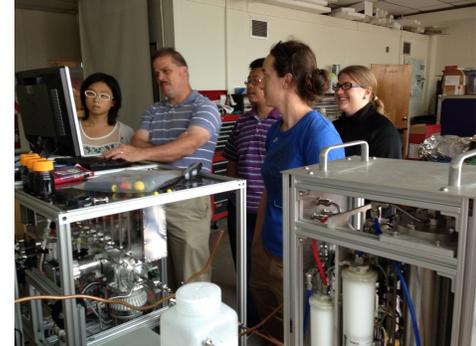
In September, doctoral student **Liam Hendricken** attended the FutureBuild 2013 Conference in Bath, England to present research work from the [Drexel Building Science and Engineering Group \(BSEG\)](#). The focus of FutureBuild is to investigate transformative ideas and building technologies to create a built environment that is adapted to the world's future needs. Liam presented building energy simulation work focused on identifying cost-effective retrofit technologies for medium office buildings in the Greater Philadelphia Metropolitan Region.



Dr. Jin Wen recently presented her current research at the National Science Foundation (NSF) Cyber Physical System PI Conference held on October 17-18 in Arlington, Virginia. The research poster presented is titled: "SMARTER-Smart Manager for Adaptive and Real-Time Decisions in Building clustERs." As buildings in the United States consume the most significant amount of primary energy and emit a significant amount of Co2 emissions, the goal of this is to develop a synergistic decision framework to enable next-generation building clusters to work as an adaptive and robust system within a smart grid, reducing overall energy consumption and allowing for optimal operation decisions enabled by cyber support tools. It is believed that the next generation building systems will freely form clusters, within each of which buildings can autonomously share and exchange site-generated energy, fundamentally transforming the consumption of energy in buildings, and therefore reducing CO2 emissions and streamlining energy consumption. Currently, a testbed to simulate a building cluster, which includes multiple buildings, site-energy generation and storage devices, as well as their interactions with a grid, has been developed. An online building energy forecasting model has been developed to effectively monitor energy efficiency and cost savings of these building clusters while providing a way to make sound decisions on a variety of building metrics.

Dr. Peter DeCarlo and doctoral student **Anita Johnson** presented talks at the American Association for Aerosol Research Conference in Portland, Oregon. Anita's talk described the characterization of a new aerosol mass spectrometer, which allows engineers and scientists at Drexel University to perform cutting edge interdisciplinary research involving the size and chemical composition measurements of aerosols, also called particulates. Dr. DeCarlo discussed the results of a joint study with **Dr. Michael Waring** examining the transport of outdoor particles to the indoor environment with highly time resolved and chemically spectated measurements. These measurements allowed the research team to identify components of the aerosol which are lost during transport outdoors to indoors, as well as identify potential indoor sources of particulate mass in the building environment.

Anita Johnson and fellow students being trained to operate an aerosol mass spectrometer acquired from a National Science Foundation MRI Grant (Award ID: 1229298)



Dr. Michael Waring and doctoral student **Adams Rackes** presented talks at the American Society for Heating, Refrigeration, and Air-conditioning Engineers (ASHRAE) IAQ 2013 Conference, held in Vancouver, BC, Canada in October. Mr. Rackes' talk described the results of a study that considered how to smartly balance indoor air quality and energy concerns in buildings through a multiobjective optimization framework, and Dr. Waring's talk discussed the impacts of residential weatherization on indoor secondary and total organic aerosol concentrations and offered solutions to offset potential increases.

Doctoral student **Noura Abu Al Faraj** attended the 2013 Delaware River Water Alliance (DRWA) conference in October. She presented a poster titled "Chemical and Statistical Analysis of Marcellus Shale Flowback Water" in which samples of flowback water from the hydraulic fracturing process in Pennsylvania, West Virginia and New York were analyzed. Flowback water is the solution that flows back to the surface and is recovered after the completion of the hydraulic fracturing process for natural gas extraction from Marcellus shale formations. Concentrations of contaminants that are present in flowback water were compared to drinking water standards in order to understand the impacts Marcellus shale drilling and hydraulic fracturing may have on human health.

New eBook Publication

The second edition of the ebook entitled "Design and Retrofit of Building Envelope" by **Dr. Ahmad A. Hamid** is now available on iBook, Amazon Kindle and Barnes & Noble. (Search by ISBN number : 9781483507996, title or author's name.) This book covers the architectural, structural, and environmental design of building envelope. Evaluation and retrofit of building envelope along with case studies are also presented.