

Spring 2014

Volume 1, Issue 2

# The Cable

The Newsletter of the Civil Engineering Program at Stony Brook University

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## Movement of Structures

by Dr. Ryan Giles



Williamsburg Bridge, 2002  
Photo from author's collection

The first time I visited New York City, I went with a group of engineering students to the center of the south pedestrian walkway of the Manhattan Bridge. We looked across the bridge deck to the north and focused on the Williamsburg Bridge in the distance. Soon, a subway train began to cross the bridge. As the train approached, the Williamsburg Bridge slowly disappeared from view. The deck of the Manhattan Bridge was deflecting in response to the increasing load. When the train passed, the Williamsburg Bridge returned to view. The experience visually demonstrated how civil structures move in response to loads.

When driving over a bridge or sitting in a conference room on the 80<sup>th</sup> floor of a building, we tend to think that the structure below us is not moving. Nevertheless, the structures that we use every day are in constant motion as the loads they experience change. Most of the motion is – by design – unnoticed. Tall buildings are

designed so that the accelerations induced by typical wind loads are imperceptible to occupants. Beams have limitations on the deflection they can undergo in response to their expected loads. However, not all loads a structure will experience in its lifetime can be considered typical.

Earthquakes, hurricanes, or blasts can cause loads on a structure that are well beyond the typical daily load of a structure. The engineer needs to design the structure to have the capacity to support these loads as well. These intense loads are highly variable with time and cause the building to move in a very dynamic way. Understanding and applying structural dynamics is crucial for buildings to remain resilient to the severe loading during disasters.

*Continued on last page...*

## ASCE News



The ASCE Stony Brook Chapter was approved by the MET Region of ASCE. The charter was then forwarded to ASCE National for final review and approval. In November last year, Stony Brook ASCE hosted Ms. Jaclyn Peranteau, PE, to discuss her experiences in civil engineering and the NYS Society of Professional Engineers. About 20 people attended.

For upcoming events and information, check out the bulletin board outside the Civil Engineering Office or follow meeting announcements on the chapter's website:

<http://stonybrook.collegiatelink.net/organization/ASCE>



Stony Brook  
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## A note from the Director

*Harold Walker, Ph.D., P.E.*

### **THE START OF SOMETHING BIG**

On October 16, 2013 Governor Andrew Cuomo announced the start of construction on the new Tappan Zee Bridge. The nearly \$4 billion project is expected to be completed in July of 2018 and is the biggest on-going construction project in North America. The new Tappan Zee Bridge, roughly 3 miles long, will be a dual-span, cable-stayed twin bridge over the Hudson River. Like the span it is replacing, the new Tappan Zee Bridge will be the longest bridge in the State of New York. The new Tappan Zee Bridge is designed to meet the transportation needs of the region, without major renovation, for the next 100 years. The construction will utilize the world's largest floating crane (the so-called "Left Coast Lifter"), which is capable of lifting 1750 tons.



*As a new program,  
we have a  
tremendous  
opportunity to "think  
big."*



Rendering of new Tappan Zee Bridge by Tappan Zee Constructors LLC and HDR Engineering Inc. [www.hdrinc.com](http://www.hdrinc.com)

Here at Stony Brook University, we are also embarking on something big– the development of the new Civil Engineering Program! Our goal is to train the next generation of civil engineers to tackle society's most pressing problems. To do so, we will establish one of the top civil engineering programs in New York and the nation. By the time the Tappan Zee Bridge is completed, we aim to have graduated our third class of students, be fully accredited by ABET, have a robust graduate program, and be a full-fledged, independent department in the College of Engineering and Applied Sciences. We have been extremely fortunate to attract truly exceptional faculty and staff over the past year and expect to continue this trend in the coming year. The development of our laboratory curriculum is nearly complete and will provide students with an outstanding, hands-on learning experience. Our students are already achieving great things, from establishing the Stony Brook student chapter of ASCE to winning national awards.

I am especially pleased to announce our two most recent hires; Ali Farhadzadeh, Ph.D., P.E. and Kaitlin Thomassen, M.S. Dr. Farhadzadeh is our first faculty hire in "coastal engineering" and is part of the Provost's Interdisciplinary Cluster Hiring Initiative. Dr. Farhadzadeh comes to us from the Center for Applied Coastal Research at the University of Delaware. Dr. Farhadzadeh will play a key role in the development of the Coastal Zone Engineering and Management program at Stony Brook University as well as the recently established New York State Resiliency Institute for Storms and Emergencies (NYS RISE). Dr. Farhadzadeh also has significant industrial experience having worked for Bechtel, one of the largest civil engineering firms in the world. Ms. Kaitlin Thomassen is serving as our Instructional Support Specialist and will be instrumental in the development and management of our teaching and research laboratories, supporting student competitions, and assisting in senior design projects. You can learn more about both Ali and Kaitlin in this addition of *The Cable*.

Like the Tappan Zee Bridge, we have a tremendous opportunity to "think big," and we will teach our students to think big as well. Our goal is to train the next generation of civil engineers to design and build a more sustainable and resilient system of infrastructure, one that will ensure the health, welfare and safety of the public for the next 100 years. Go Seawolves!

## Dr. Ali Farhadzadeh, New CIV Faculty Member for Coastal Zone Cluster



Dr. Farhadzadeh, P.E.

*"Better preparedness against flooding requires deeper understanding of coastal phenomena as well as better design procedures for coastal infrastructure."*

Due to an increase in frequency and intensity of major storms, coastal areas are more vulnerable to erosion and flooding. In late 2013, Typhoon Haiyan claimed thousands of lives and cost millions of dollars in damage. The scenes of devastation caused by Hurricane Sandy in New Jersey and New York, in 2012, will never be forgotten. In the U.S., more than half of the country's population lives in coastal counties. The direct and indirect physical effects of future sea level changes and intensified storms must be taken into account during the planning, engineering, and designing of coastal projects.

Dr. Farhadzadeh's research interests are how to approach

these challenges and develop solutions for them. His research also focuses on storm surge and wave modeling, sediment transport and nearshore morphology, wave run-up, overtopping and overflow, dune and levee erosion, coastal structures design, swash zone hydrodynamics and hydrodynamics of lakes.

Dr. Farhadzadeh earned his Ph.D. and M.S. in Coastal and Ocean Engineering from the Center for Applied Coastal Research (CACR) at the University of Delaware. He also earned a M.S. in Hydraulic Structures from Tarbiat Modares University (TMU) and a B.S. in Civil Engineering from University of Tabriz, Iran.



Ocean City, MD: Days before Hurricane Sandy made landfall near Atlantic City, massive waves surge towards the beach, October 2012. (Photo by Kevin Lamarque, Reuters)

## Ms. Kaitlin Thomassen, New Laboratory Technician for CIV Teaching Lab



Kaitlin Thomassen, M.S.

*"People often ask, why build a canoe out of concrete?! While concrete has become the most widely used building material in the world, it remains a mystery to many. It's in our sidewalks, the foundations of our homes and in buildings, bridges, roads and dams around the world. What better way to learn about the most commonly used building material than to build a floating vessel and race it against other universities?"*

Kaitlin Thomassen has joined the CIV Program to provide expertise in the development and operation of all laboratory courses. The Civil Engineering Lab will soon be fully equipped with state-of-the-art testing equipment, including a 300kN Shimadzu Universal Testing Machine, Digital MasterLoader for automated computer-based triaxial testing, Humboldt Direct/Residual Shear Machine, Harvard Compaction Apparatus, a 1,334kN Humboldt Compression Machine, Marshall Asphalt Compression Machine, and a Pundit Lab Ultrasonic Test Device to name just a few! With this new equipment, Ms. Thomassen and the CIV faculty are developing engaging and relevant experiments that will prepare students for successful careers in civil engineering.

In 2013, Ms. Thomassen earned her M.S. in Mechanical

Engineering from Stony Brook University. She completed her B.A. in Mathematics from the State University of New York at Geneseo in 2008. Before coming to Stony Brook University, Ms. Thomassen worked at Brookhaven National Laboratory in Upton, NY and CVD Equipment Corporation in Central Islip, NY. With extensive experience designing experiments and working as a mechanical design engineer, she is excited to use her knowledge to take on this new challenge.

Ms. Thomassen will also be spearheading the development of two new civil engineering clubs at Stony Brook University. The first, Concrete Canoe Club, will challenge students to design and build an operational canoe made of concrete. Using their design, students will compete in the American

Society of Civil Engineer's Concrete Canoe Competition held each spring.

Ms. Thomassen will also establish the Steel Bridge Club. The National Student Steel Bridge Competition, sponsored by the American Institute of Steel Construction in cooperation with the American Society of Civil Engineers, tests students' ability to design, fabricate, and construct a steel bridge. This inter-collegiate challenge requires awareness of real-world engineering issues such as spatial constraints, material properties, strength, serviceability, fabrication and erection processes, safety, aesthetics, project management, and cost. Both competitions will require civil engineering students to put their classroom knowledge to the test!



## Meet Your Classmate! Nelsy Badia, '17

Nelsy Badia, class of 2017, is starting her second term at Stony Brook. We caught up with Nelsy for a brief interview.

**TC: We heard that you are double majoring at Stony Brook. What made you decide to major in both Music - Viola and Civil Engineering?** Since I began playing the viola in 4<sup>th</sup> grade I knew that I wanted to pursue music in college. Despite taking private lessons from the time I was 9 or 10 years old through high school, my parents always thought that playing the viola was just a hobby for me, no matter how much I insisted that it was what I wanted to do for the rest of my life. When it was time to select a major, my parents discouraged me from music because they did not think it was practical. Other than music, I enjoyed math and science and liked finding unique solutions to problems. My father suggested engineering as a career and I decided to look into it. My high school physics teacher informed my class of a summer engineering program for women and minorities at Manhattan College that would introduce us to all the types of engineering. I applied to the program, run by the ACE mentorship program, and spent an intensive week participating in labs, projects, and lectures

associated with different types of engineering in New York City. **[TC: please see box below for more details about the ACE Mentor Program]** During this program, I also visited Thornton Tomasetti, an engineering firm that focuses on the building industry. While there, I spoke with civil engineers and learned about their projects. This trip convinced me that my second major would be civil engineering as it combined all the aspects of creativity, designing, and logical reasoning that I enjoyed. I continued with the ACE mentorship program throughout my senior year and along with several other students, I was placed with a mentor. Our team designed the structural aspect of a community center. By the end of my senior year, I was fully convinced that I wanted to major in civil engineering. When I first started Stony Brook, I thought about minoring in music but as the end of the semester approached I realized that the only way to satisfy my passion for music was to major in it as well—no matter how challenging it would be to succeed in both majors.

**TC: What classes have you taken that have been particularly interesting and engaging for you?** Last

semester I took MEC 101, which is an introduction to mechanical engineering. At first I wasn't too excited about this class because it didn't seem to relate to me, but by the end of the semester I realized how much I had actually enjoyed it. A major component of this class was a group project in which we had to design and create a toy that would appeal to a young child. We decided to create a pirate ship that would shoot M&Ms from a canon. Through this project I was able to learn hands-on the concepts for the class as well as make new friends. I learned how to work in a group and communicate with others, which is very important for engineers to be able to do. I also really enjoyed being a part of a chamber ensemble, specifically a piano quartet. I had been part of chamber groups before college but they were not as rigorous or engaging. Even though it required a lot of determination and practice, it allowed me to disconnect from the world and relieve stress from my intense coursework.

**TC: What has been the highlight of your college career to date and what are your summer plans?** The highlight of my college career so far has been meeting people from all over the world who have also chosen to study at SBU. All my life I had



Nelsy on Long Island's North Shore

been surrounded by the same people and always had the same group of friends. Coming here made me realize that spending all those years with the same people made us all have very similar views of the world and develop similar ways of thinking. Stony Brook is a wonderfully diverse place that allows you to interact with people of many different cultures and learn about other ways of viewing the world that you may have never imagined. This is fascinating and has made my college experience exciting. This summer, as a result of choosing to double major, I will be taking several courses to free up my sophomore year so that I can start taking classes that fulfill my music major. If I manage to have some free time after that, I hope to travel back to Spain, where my family is originally from, to visit my friends and family and refresh my brain before beginning an intense new semester.

### ACE Mentor Program (Architecture, Construction and Engineering Mentor Program)

Founded in 1994, the ACE Mentor Program pairs industry professionals with high school students to inspire students to pursue careers in design and construction. Since 1994, ACE has awarded over \$14 million in scholarships to promising participants. Although this program started in New York City, it became a non-profit organization in 2002 and is headquartered in Washington, DC. The ACE Mentor Program now has affiliates in more than 200 cities nationwide. For further information, including how to become a volunteer mentor-professional or to view other resources, please visit: [www.acementor.org](http://www.acementor.org)

## Internship Opportunities

Internships are a great way to gain experience in Civil Engineering while still an undergraduate student. Many companies, municipalities, and other government agencies offer paid internships during the summer and other parts of year. Why not gain valuable experience in Civil Engineering and also earn a paycheck? Often these summer internships can lead to full-time job offers upon graduation. At the very least, you will gain valuable experience to put on your resume as well as learn more about the exciting profession of Civil Engineering. If you are a current student in Civil Engineering, you should have received an email over Winter break detailing a host of internship opportunities. (Click [here](#) for the list. Or, go to Civil Engineering's website.) You may also want to consider doing research over the summer. The National Science Foundation and Department of Energy both have great programs that provide opportunities for undergraduates. You can also approach a faculty member at Stony Brook University to discuss opportunities here on campus. If you'd like to know more about internships or research opportunities, please stop by the Civil Engineering Office in 250 Heavy Engineering.

## Coastal Zone Engineering and Management Program Update

Through close collaboration between Civil Engineering, the School of Marine and Atmospheric Sciences (SoMAS), Geosciences and the Sustainability Studies Program, a new program in Coastal Zone Engineering and Management is being created. Two new faculty members were recently hired as a result of an extensive nation-wide search. Dr. Anthony Dvaskas, who will be in SoMAS, is an environmental economist and Dr. Ali Farhadzadeh is a coastal engineer who will be added to the existing Civil Engineering faculty. Both faculty members for the cluster will have close ties to the

CIV program and will be working on joint projects with our faculty.

In the coming year, there will be two more faculty hires for the Coastal Zone program, one a Civil Engineer with a specialization in Ports and Harbors. The other faculty member will be a Coastal Hydrologist who will work closely with Geosciences. The selection process to fill those two faculty positions has already started. The last two faculty positions that will make up the Coastal Zone program are an Ecosystem Manager of Coastal Zones and a Marine Structural Engineer.

## Photo Contest for *The Cable*



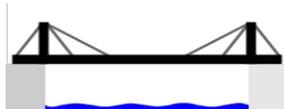
The picture of the cables from the Brooklyn Bridge that adorns the first page of this publication was taken by our own Dr. Giles. In keeping with the spirit of collaboration, we are holding a photo contest for the fall 2014 newsletter. This competition is open to all members of our Civil Engineering community.

Submit up to 3 of your original digital photographs highlighting the field of civil engineering to [civil\\_engineering@stonybrook.edu](mailto:civil_engineering@stonybrook.edu) by 5 pm,

Friday, August 15, 2014. Submissions must describe what each picture shows and any additional information the contestant wishes to include, e.g. why the photo is significant, how the photo shows the impact of civil engineering on people's lives, or what the photo means to you.

Faculty, staff and students will have an opportunity to vote for the best photo(s) to be used for next fall's newsletter. The voting period will start on 8/19 and conclude at 12 pm on August 28<sup>th</sup>.

Good luck!



## Civil Engineering Scholarship Recipients and other notables

We are delighted to announce that Marie Baietto, class of 2016, was awarded the Evan Liblit Memorial Scholarship late last year. Dr. Evan Liblit was a scholar in SoMAS. The scholarship is part of an endowment established in his honor. The ceremony was held in mid-November and Marie gave a speech describing some of her activities. Dr. Walker said in his introduction that Marie is an impressive student and quickly becoming an ideal role model and leader. Congratulations, Marie!

The same day that Marie was being recognized for her hard work and dedication, Morgan DiCarlo was named the Grand Finalist in a nation-wide scholarship, the [2013 Global Women's Initiative Discover Scholarship](#).

Morgan won for her essay exploring the lack of women in STEM fields and how to address this important issue. Five Finalists, including Morgan, were flown to Chicago for the Global Women's Initiative Conference where they led a small panel briefly discussing the ideas written in their essays. Morgan was named the Grand Finalist after the panel's presentation.



November 2013: Marie Baietto '16, 2013 Liblit Undergraduate Scholarship recipient, with Dr. Walker, Civil Engineering Program Director, and Mr. Mike Cahill, Esq. at the awards ceremony.

This spring will also be the first time the Othmar Ammann Endowed Scholarship will be awarded to one of our civil engineering students. We encourage everyone to apply by Friday, February 7, 2014. **Please be sure to read all the information on the CEAS webpage regarding scholarships:**

<http://www.ceas.sunysb.edu/undergrad/Scholarships/CEAS/default.asp>

We would also like to congratulate students who have been on the Dean's list in 2012 or 2013.

Representing the class of 2016: Marie Baietto, Ramona Chen, Anthony Cundari, Morgan DiCarlo, Gabriela Saenz and Kevin Yee.

Class of 2017: Nelsy Badia, Andrew Brennan, Anthony Chubenko, Laura Coronel, CJ Drury, Steven Earlie, Acacia Galbraith, Bradley Garcia, Christopher Jurado, Bin Lin, Mudassar Memon, Andrew Mock, Jason Peng, Dhruv Ray, Eric Steiger, Wing Yim Wu and Christopher Zaverdas.

Morgan DiCarlo '16, the 2013 Grand Finalist, Global Women's Initiative Scholarship presented by a Discover Representative at the Womenetics Global Women's Initiative Conference in Chicago, November 2013.



**Stony Brook  
University**

<http://me.eng.sunysb.edu/>

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*Please email us with any comments, suggestions, corrections, questions, or stories to include in future editions, etc. We love hearing from our students, the civil engineering practice community, and other stakeholders. We strive to make the newsletter as relevant and interesting as possible.*

*Thank you!*

## Movement of Structures cont'd.

To help Stony Brook students better understand structural dynamics, we recently purchased a small shake table. A shake table is a machine that can simulate earthquake events. Model structures can be placed on top and subjected to the simulated earthquakes to better understand how the actual structure will respond. The shake table will be used for classroom demonstrations, CIV laboratories, and research

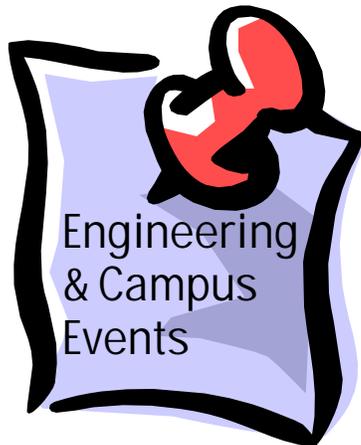
into structural dynamics and control. We also hope to use it in outreach programs, especially in secondary and primary schools.

The better we understand the response of structures

to dynamic loads caused by earthquakes, hurricanes, and blasts, the better we can design buildings to be more resilient. Resilient structures are a step toward a more sustainable future.



*Educational shake table manufactured by Quanser Consulting, Inc. Image from their website.*



### 12<sup>th</sup> Engineering Ball

**What?** An annual semi-formal dinner dance held at the end of each academic year for all engineering faculty, staff, students, alumni, corporate sponsors and their guests. Tickets cost approximately \$40.

**When?** April 6, 2014

**Time?** Evening, TBA

**Where?** Lombardi's on the Sound

Please monitor CEAS's events page for more information:

<http://www.ceas.sunysb.edu/Undergrad/Events/default.asp>

### SBU Roth Regatta

**What?** Annual campus-wide boat race in the Roth Pond. Teams build boats using duct tape and cardboard only. Trophies are awarded!

**When?** April 25, 2014  
Campus Life time.

**Where?** Roth Pond

### May Awards Ceremony

**What?** Annual awards ceremony for Civil and Mechanical Engineers

**When?** TBA

**Where?** 143 Engineering

## Giving to the Civil Engineering Program

Stony Brook University's Civil Engineering Program graciously accepts endowments and financial gifts. Regardless of the amount, each and every contribution we receive is important to the future of Stony Brook University and in particular, Civil Engineering's mission of teaching, research, and service to society. Whether your

passion is student scholarships, helping us build our laboratories, or supporting faculty research, a gift to Stony Brook is a meaningful investment in creating a better future. To learn more, please contact the director of the program, Dr. Harold Walker, by phone 631-632-8315 or by email: [harold.walker@stonybrook.edu](mailto:harold.walker@stonybrook.edu)



**Every  
gift  
matters.**



Besides establishing student scholarships and research opportunities, one thing we would especially like is a 'Zalk Steel Sculpture'. Both artistic and educational, the sculpture displays in full scale the most common methods to connect steel in building construction. We would love your support in helping us with this project! If interested, please contact Dr. Walker, 631-632-8315 or [harold.walker@stonybrook.edu](mailto:harold.walker@stonybrook.edu)

Photo courtesy of [University of Wisconsin-Madison](http://www.wisconsin.edu)