

NEWS

News Blurbs Now! (NBN)

The University at Buffalo's Student Chapter of the American Society of Civil Engineers was recently awarded the 2015 ASCE Distinguished Chapter Award for Region 1, recognizing them as the most outstanding student organization among the 48 student chapters in its region. Congratulations and keep up the great work!

The Federal Reserve Bank of New York has a new team! They will be dedicated to reviewing cybersecurity threats and are led by Roy Thetford. How much will cybersecurity be a threat to our financial stability in the future?

Perhaps you remember visiting the observatory at the Buffalo Museum of Science? It has been closed since 1999 but a capital campaign has been started to raise the remaining \$1.2 million needed to restore it and its telescope. This is the final planned phase in the museum's restoration plan which began around four years ago.



Photo by Pubdog

NASA's Scott Kelly will be spending an entire year on the International Space Station while her twin astronaut brother will be spending that year on the ground. The study of the two should help with analyzing the effects that long term space habitation could have.

NASA technology was used to find two men in each of two different locations trapped under 10 feet of rubble in Nepal after the April 25 earthquake. The FINDER (Finding Individuals for Disaster and Emergency Response) tool used microwave radar to detect heartbeats of trapped individuals.

EGW Associates, Inc added over twenty new direct hire openings in May. Visit www.egwjjobs.com to find positions for civil, manufacturing, mechanical, nuclear, project, and quality engineers etc. EGW has opportunities for engineers looking to make a career change or to start their career.



EGW Associates, Inc.



Picone Construction Corp is proud to welcome Colin G Thrun as an Estimating Assistant. Colin holds an Associate in Applied Science degree in Civil Engineering Technology from Erie Community College and is finalizing his Bachelor of Science in International Business from Rochester Institute of Technology.

Picone has recently completed safety improvements to Kleinhans Music Hall located at 3 Symphony Circle, Buffalo.

Partial height wall assemblies in the main hall were replaced with adjustable height ones to accommodate wheelchair seating. The Architect of Record is HHL Architects and the Mechanical and Electrical Engineer is M/E Engineering PC.

Engineering graduates will probably be enjoying one of the highest starting salaries in 2015 compared with other majors. The average starting salary is estimated to be just shy of \$63,000 which is higher than projections for those in fields like business, math, computer science, and the natural sciences. Congratulations graduates...you made an excellent decision choosing engineering!

Next time you visit Las Vegas, you can still grab a taste from Buffalo. An Anchor Bar franchise is slated to open at the Venetian on June 15.

Check out some shipwreck photos in Lake Michigan at www.onearth.org/earthwire/these-ships-have-sailed as the weather made for some beautiful shots that are normally covered by ice in the winter and suspended sediment in the summer.

We need your news blurbs NOW! We want to know about your recent projects, awards, hires, promotions, patents, new products, partnerships, open houses, tours, and anything else you'd like to share. Send your news to ESB1894@gmail.com. Hey, this is free advertising for your company really. Why wouldn't you want to write up something quickly about something cool that you did?!!

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TECHNICAL ARTICLE

Brooklyn Bridge, Creating Grandeur

By Chandra Bhushan, Architect

This is probably the biggest and oldest infrastructure project in bridge construction that is still in use, and it wonders us that our small hands can do such a miracle when guided by the mighty mind. The project was gigantic and so was its construction. It was a battle of engineering science with nature that took lives of many during the construction, and the first one to sacrifice was the creator himself.

Any person who has sentiments, cannot cross this bridge in continuation, the grandeur and beauty compels him to stop and glance at it for a while. - Chandra Bhushan

In 1860, due to population explosion in New York City and Brooklyn, it was realized that a bridge was necessary to connect these cities that are separated by East River. In 1866, New York State Legislature passed the bill for construction of a bridge over the East River and New York Bridge Company was formed. The company appointed John Augustus Roebling as its Chief Engineer on 23 May 1867. Roebling was born on 12 June 1806 in Germany. While in school he developed an interest in both metaphysics and in bridge building. He graduated with a degree in civil engineering from the Royal Polytechnic Institute of Berlin in 1826.

In 1831, Roebling and his brother immigrated to Pennsylvania to farm. When this venture failed, Roebling accepted the position of Pennsylvania state engineer. In this position, he surveyed and supervised the construction of canals, locks, and dams. In 1841, Roebling invented the twisted wire-ropes cable, an invention which foreshadowed the use of wire cable supports for the decks of suspension bridges. Six years later, he established a factory in New Jersey for the manufacture of this cable. Because the cable could support long spans and extremely heavy loads, Roebling quickly gained a reputation as a quality bridge engineer.

The gap here to be covered was 1600 feet in a single span, so that ships can cross over under the span while the clear height required was 135 feet. As a chief engineer of the company, Roebling designed the Cable Suspension Bridge to meet all these requirements. Roebling then called the board of consulting engineers after completing his design to examine his plans. Three other engineers from the war department also examined to see whether or not the bridge would be an obstruction to navigation. The scheme was perfect; structurally and architecturally, and the plans of Roebling were fully endorsed by both board of engineers and the government commission. Just two months after the approval, on 9 July 1869 while fixing the location of the tower on Brooklyn side, a boat bashed the slide where Roebling was standing. In this accident, Roebling's foot got crushed and in spite of medical aid, he at 63 could not bear the severe pain and died 14 days later on 22 July 1869. It was a great setback for this monumental project. Realizing the fact that the Roebling's cable wire manufacturing company was the world leader in this technology, his son was anonymously chosen as his successor; Washington A Roebling who had not only been the accomplished associate of his father in some of his principal works but had aided him most efficiently in the preparation of the designs and plans of this bridge.

The construction of the bridge began on 3 January 1870 and the site preparation for the Brooklyn side tower started. Two towers of height 276 feet each with twin gothic arches were to be erected at the side of the river. How will they do it with foundations as deep as 78 feet? It was eight story high foundations with solid concrete! Digging could not be done along the side of river as water would percolate making the digging impossible. To resolve this, caissons were built for each bank. It is a box structure open from one side, the open side is put on the ground; workers then go inside from trap door on the top and work inside this caisson. As digging proceeds, the caisson descends by

enormous weight that is put on it. To stop the water to percolate from ground, enough air pressure is generated inside the caisson which is an airtight structure. For this project, huge caissons were built for each side. Workers were working under the closed wet cabin that had double the pressure that we experience normally. Under this extreme pressure, nitrogen gas that is present in the atmosphere is dissolved in blood which is not actually harmful, but a sudden release in pressure makes this gas bubble out quickly from the body creating a violent pain. Also, the higher pressure drives blood into the central part of the body like into the brain, spinal cord, and bone joints. Because no one was aware of this fact, workers continued to work. The result? Workers were having caisson disease. They had joint pains and some of them were completely paralyzed and soon died. As Washington A Roebling visited these Caissons occasionally, he contracted the same disease in May 1872 just after completing the foundations, however he was managing the project as it was his father's dream that he wanted to accomplish.

After the foundations, the towers were erected. The specifications were changed from brick and stone masonry to granite and brick to make the structure sturdier. The towers were fascinating and many people were visiting to see these gigantic structures across the East River. Two workers fell from these towers during construction and died instantly. After completing the towers, four main cables had to be put in place across the span that would ultimately hold the bridge deck. The cables were made of 19 strands and each of these strands had 258 wires each 3.2mm thick, making the cable almost 16 inches thick. Each cable extending from one anchorage to other had 320 kilometers of wire. Very meticulously, each wire was put from one end to another and then wrapped finally. Cabling was a dangerous task. Any error could be fatal. While taking each wire one by one from one end to the other, accidentally one wire slipped and the cable went into the river chopping off one of the workers head. More than a dozen workers died. Tough site conditions were becoming the greatest challenge and further to increase the humiliation of this team of 600 workers, another setback hit the project.

Washington A Roebling's health was getting worse. He was not able to move. He was almost paralyzed, partly blind, deaf, and mute. He was not able to supervise the project at the site so they put his bed along a window in Brooklyn where he could see the bridge and manage from there. His wife Emily was liaisoning the project now and brought messages to the work site from his bedside. Emily Roebling became the surrogate Chief Engineer for the bridge and continued the work of her husband. She learned higher math and engineering through "on-the-job" training.

The deck was built with a steel structure resting on the main four cables through 1520 suspenders and 400 diagonal stays. The bridge had two lanes on either side with an elevated pedestrian way in the center. Finally, the bridge was completed on 24 May 1883 at 2 pm. The bridge, at many times seeming impossible due to nature's curse, shattered all records for suspension bridges of the day. It was 500 feet longer than the largest suspension bridge and extended 6000 feet from end to end. In spite of Roebling's inability to supervise the work, his wife did excellent effort. She was so involved in the project, that she was the first person to ride across the span during the opening ceremony while president Chester Arthur and New York Governor Grover Cleveland followed Mrs. Roebling. This was the greatest gratitude that the citizens could give to the Roebling family.

Chandra Bhushan, Architect and CBS Team authored this article. It has been compiled by CBS Team (www.cbsforum.com) in association with independent practicing consultants. This article appears at www.articlecity.com/articles/travel_and_leisure/article_284.shtml.

CALENDAR OF EVENTS

06-01-15		ESB Scholarship Applications Due	
06-04-15	10am	Mini Maker Faire	Buffalo Museum of Science
06-08-15	6pm	Ways and Means Meeting	2555 Walden Ave, Buffalo (Wendt Corp)
06-08-15	7pm	Directors Meeting	2555 Walden Ave, Buffalo (Wendt Corp)
06-25-15	12pm	ASCE Tour Silo City: Grounded + Lunch	120 Childs Street, Buffalo
07-22-15	7pm	ESB Annual Scholarship Run	Buffalo Harbor State Park
07-25-15		Amtrak Train Day. See May issue.	Dick Road, Depew
08-04-15		ESB/Beam Golf Tournament	Chestnut Hills Country Club, Darien
12-3 to 12-5		Construct Canada	Toronto



NEXT BIG ESB EVENT

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TECHNICAL ARTICLE

Polybricks

By Jeffrey Scott Taylor

As the world expands, so does the vision and imagination of its people. Recent innovations in the way we are building the world around us have been nothing short of revolutionary. One of these innovations comes from the world of three dimensional printing. For those of you who are unfamiliar with three dimensional printing, it is exactly what it sounds like; machines that have the ability to “print” solid three dimensional objects. There are a variety of materials 3D printers use to produce an already endless list of simple and complex objects from plastic and metal to ceramic and cement.

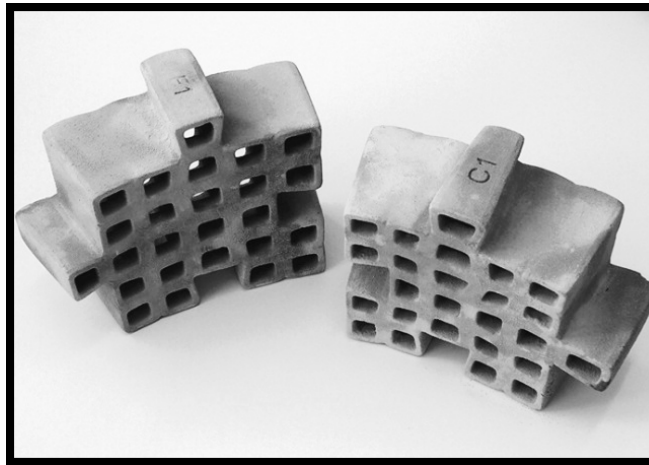


Photo by Sabin Design Lab, Cornell Architecture

Research and developers at Cornell University have created a system of interlocking ceramic bricks that may change the way we construct a variety of our buildings and our structures. They call their invention the Polybrick. They are actually quite unlike traditional bricks as we know them. Polybricks interlock with tapered dovetail joints and require no mortar in between them as they are assembled. They are manufactured with the precision of specialized computers and they fit together so well that there is no need to fill gaps or bond them together. The bricks are for the most part, hollow as well featuring what can be described as a honeycomb like interior. They are fairly lightweight and very strong. Gravity along with complex mathematical algorithms also play a part in their strength as the interlocking bricks are stacked and used to construct walls.

Team leader Jenny E Sabin states that "PolyBrick is the first mortarless, 3D printed wall assembly. It will allow for the production of ceramic wall assemblies that are robust and high strength due to the novel implementation of highly complex

and organic generative design strategies that are also simply and economically produced". She also went on to say, "3D printing allows us to build and design like nature does, where every part is different, but there is a coherence to the overall form at a global scale." The ambitions of Sabin and the team at Cornell are perfectly clear in the results of their work. Sabin also says that the printing of their Polybricks is very cost effective and requires very little labor, maximizing efficiency by using low cost materials.

Jenny Sabin is an assistant professor in Design and Emerging Technologies in the Department of Architecture at Cornell University. She is also the principal of Jenny Sabin Studio, an architectural design studio based out of Philadelphia. She has a master's degree in architecture from the University of Pennsylvania, as well as degrees in ceramics and interdisciplinary visual art from the University of Washington. She is not the only person to work on the development of this new building material but her contributions may very well be what made it all possible.

Although the implementation and immediate uses of the Polybricks are still in their early stages I would have to say the future looks promising. Architects, engineers, builders and designers are always looking for ways and means to improve upon the way they do their jobs and get things done. Three dimensional printing already appears to be playing a bigger role than it ever has and doesn't look to be slowing down anytime soon.

Jeffrey Scott Taylor is a construction worker that also has a head on his shoulders. He enjoys researching, learning, and sharing his knowledge. He is also a great interior painter and would like to write song lyrics professionally. Jeff can be reached at jstjr1225@yahoo.com.

JUNE BIRTHDAYS

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TECHNICAL ARTICLE

Warding Off Failure

by Patricia Mroczek

Imagine a world where bridges, roads, heart valves, or knee replacements could monitor themselves and send a warning signal before they fail. Imagine then, if these advanced pieces of technology could power themselves and operate for years without needing any maintenance.

Shantanu Chakrabarty, a researcher at Michigan State University (MSU), has worked for almost a decade on these safety-critical goals. Using four National Science Foundation (NSF) grants since 2006, the associate professor of electrical and computer engineering has focused on the fundamental science behind self-powered sensors for health and usage monitoring. "My part is the core science that drives this technology," Chakrabarty said. "I am interested in the device's physics and in exploring new ways to sense and compute on the sensor. The technology is currently being piloted in different applications and every new application allows me to optimize the sensor in different ways."

Self-powered sensors developed by Chakrabarty and his collaborators may be attached to or embedded inside bridges, pavements, vehicles, rotating parts, and biomedical implants. They can autonomously sense, compute, and store cumulative statistics of strain rates, without the aid of batteries.

With NSF support, Chakrabarty discovered a unique synchrony between the physics of flash memory and the physics of devices that convert mechanical stress into energy. The innovation, called piezoelectricity-driven hot electron injection, enables energy-harvesting sensors to be miniaturized. These tiny sensors can then be embedded inside structures like wind turbines or rotor blades. They can even be placed inside the human body.

A network of micro-sized sensors can self-diagnose any catastrophic failure, according to Chakrabarty. Once fully packaged, he hopes the sensor will become an integral part of any "smart" structure, whether it is civil, mechanical, or biomechanical.

The sensors can be remotely retrieved with a smartphone and used to predict the onset of mechanical failure. Users may be alerted to potential problems, minimizing the risk of bodily harm and significantly reducing maintenance costs. "Currently, we're looking at using a diagnostic ultrasound to retrieve data from the sensors implanted in the body," Chakrabarty said. "This will be highly cost-effective and will be compatible with instrumentation already used by

health care professionals."

"My goal is now to explore new biomedical applications of these sensors and push its limits of performance," he said. One of the new sensor applications is smart sports helmets that diagnose concussions. "At a time when we all carry sensors in our pockets and on our wrists to monitor many of our daily activities, technology that enables the assessment of the health of critical infrastructure, vital organs, or the occurrence of life-threatening events is long overdue and sorely needed," said Massimo Ruzzene, program director in NSF's Engineering Directorate. "Dr. Chakrabarty's innovations in the area of remote, self-powered sensing significantly contributes to this need."

Chakrabarty won an NSF CAREER Award in 2010 for his research in energy-harvesting sensors and processors. Though his Adaptive Integrated Microsystems Laboratory at MSU, he has been working on a revolutionary sensing paradigm to help engineers and doctors monitor the health of mechanical structures. The self-powered sensor research has spawned two U.S. and international patents with several other patents pending. The technology is being marketed by the MSU Technologies Office and has led to the formation of Piezonix, a start-up company based in Michigan.

Key outcomes:

- Chakrabarty's technology has led to two issued US patents with several patents pending. The technology also won him the Michigan State University 2012 Innovation of the Year Award, and has created an array of ongoing scientific collaborations.
- Nizar Lajnef, assistant professor of civil engineering at MSU, earned his PhD through a related NSF award. His research monitors the degradation of asphalt and bridges. Read more in "Street Smarts - Monitors being created to watch for road and bridge defects."
- Several undergraduate senior design projects led to the development of software used for collecting data from the sensors.
- Spin-off collaborations include research on smart infrastructure (roads and bridges), smart aircraft skins, smart orthopedic implants, smart heart valves, and smart football helmets.

Patricia Mroczek is the Communications Manager at the Michigan State University College of Engineering. She can be contacted at mroczekp@egr.msu.edu.

Local/Online PDH Opportunities

For additional information regarding these opportunities, contact our office at ESB1894@gmail.com or 716-873-4455. Discounts for some pricing are available for certain society members, small companies, etc. And if you have information regarding future PDH opportunities that may be of interest to our members, please forward them to our office for inclusion in the newsletter and on our website at www.tesb.org.

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All	1.0	Online	Role of Mobile Water Treatment to Offset Emergency/Schedules Plant Shutdowns	Free
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06/03/15	1.5	Webinar	Design of Buildings for Coastal Flooding	\$349
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Fort Niagara State Park Goes Green

By Randy Simons and Dan Keefe

The New York State Office of Parks, Recreation, and Historic Preservation (State Parks) flipped the switch on a 50 kilowatt solar photovoltaic (PV) system installed by State Park employees at Fort Niagara State Park which will save \$9,100 annually. It brings a clean, modern source of energy to the park and enhances efforts to improve energy efficiency. The announcement was made in honor of Earth Week which Governor Cuomo proclaimed as a weeklong celebration of New York's commitment and accomplishments to protecting our environment, conserving open space, increasing access to the state's vast and magnificent natural resources, implementing clean energy initiatives, and preparing for the effects of climate change.

"State Parks is leading the way in clean, renewable solar energy use and I'm elated that we are helping to power the oldest buildings on the Great Lakes with a clean, 21st century energy source," State Parks Commissioner Rose Harvey said. "As we celebrate Earth Week, this project reflects State Parks' commitment to create a green and sustainable park system."

The \$90,000 Fort Niagara project is the ninth installation State Parks has completed to date. The system's 219 solar panels will generate a total of 57,130 kWh annually – enough to power eight full houses. The system will power the entire maintenance facility as well as ten percent of other park facilities, including the 18th Century Old Fort Niagara State Historic Site.

State Parks employees installed the guaranteed 25 year life PV system after receiving solar installer certification training at Alfred State College and certification by the New York State Energy Research Development Authority (NYSERDA). John B Rhodes, President and CEO of NYSERDA said, "The project...is a model of how the state is leading by example in using renewable energy to power its facilities and protect the environment. Visitors to the park can see first-hand the state's commitment to increasing solar power under Governor Cuomo's NY-Sun initiative, and we congratulate the State Parks employees that installed the solar system."

State Senator Rob Ortt said, "This solar panel project unquestionably brings Fort Niagara into the 21st century by using one of the world's fastest growing energy sources. While this installation will drive down costs for State Parks, it is clear that it'll also have economic, social, and environmental benefits for future generations. We can only hope that this solar panel system can serve as a model for other projects as our region moves toward expanding our energy capabilities."

On Thursday, Governor Cuomo announced that State Parks will install its largest solar PV project at Robert Moses State Park on Long Island. The 500 kW system will create the first energy neutral State Park in the nation. All of the park's net annual energy needs will be generated on-site. In addition, State Parks will install another 300kW of solar-power generating capacity at parks across the state which should generate \$180,000 in savings annually.

The first installation of a PV system by State Parks employees was at Niagara Falls State Park's Discovery Center. Other locations across the state include Letchworth State Park, Allan Treman in the Finger Lakes, Robert Moses on Long Island, and Grafton Lakes in Rensselaer County.

The project highlights Governor Cuomo's NY Parks 2020 to modernize and transform the New York State park system, including projects to prepare for climate change and make State Parks a model of sustainability. NY Parks 2020 is a multi-year commitment to leverage a broad range of private and public funding to invest approximately \$900 million in State Parks from 2011 to 2020. The 2015-16 State Budget proposes \$110 million toward this initiative.

The New York State Office of Parks, Recreation and Historic Preservation oversees 180 state parks and 35 historic sites, which are visited by 62 million people annually. For more information on any of these recreation areas, call 518-474-0456 or visit www.nysparks.com, connect on Facebook, or follow on Twitter.



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Fry An Egg On The Sidewalk?

Yes, theoretically you can fry an egg on the sidewalk if it's hot enough. But it doesn't actually get hot enough.

This question comes from the saying "It's so hot you could fry an egg on the sidewalk!" How many kids, hearing it, actually try? Most likely they end up with a mess resembling scrambled eggs more than one sunny-side up. So what's the problem?

An egg needs a temperature of 158°F to become firm. In order to cook, proteins in the egg must denature (modify), then coagulate, and that won't happen until the temperature rises enough to start and maintain the process.

The sidewalk presents several challenges to this. According to an experiment reported in Robert Wolke's book, *What Einstein Told His Cook: Kitchen Science Explained*, sidewalk temperatures can vary depending on the composition of the sidewalk, whether it is in direct sunlight, and of course, the air temperature. Dark objects absorb more light, so blacktop paving would be hotter than concrete. More often than not, sidewalks are concrete. Wolke found that a hot sidewalk might only get up to 145°F. Once you crack the egg onto the sidewalk, the egg cools the sidewalk slightly. Pavement of any kind is a poor conductor of heat, so lacking an additional heat source from below or from the side, the egg will not cook evenly.

Something closer to the conditions of a frying pan would be the

hood of a car. Metal conducts heat better and gets hotter, so people actually have been able to cook an egg on a car hood's surface.

Still, the idea of cooking an egg on a sidewalk won't die. It is so intriguing that the city of Oatman, Arizona, hosts an annual Solar Egg Frying Contest on the 4th of July. Contestants get 15 minutes to make an attempt using solar (sun) power alone. Oatman judges, however, do allow some aids such as mirrors, aluminum reflectors, or magnifying glasses which would help to focus the heat onto the egg itself. It turns out that eggs also have a bit of an advantage in Arizona, the land of low humidity and high heat. Liquids evaporate rapidly when humidity is low. The eggs have a bit of "help" while they cook, and they dry out faster.

I bet you were wondering what is the origin of the saying? It's not clear, although there is a reference to it in the Los Angeles Times on October 5, 1933 and even as far back as June 11, 1899 in *The Atlanta Constitution* - so the idea had captured the American imagination and become one of our common sayings by that time. And what about the other saying, "it's so hot the chickens are laying hard-boiled eggs?" Well, what do you think?

Learn about everyday mysteries at www.loc.gov/rr/scitech/mysteries and you could be full of fun science facts too!



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Do You Know A Workaholic?

by Tara Pfarner

There is a fine line between a high quality, dedicated employee and a workaholic. That word may bring a name to mind - the first person in the office and the last to leave, the one who has difficulty delegating work and takes it home with them, staying connected 24/7. Why should you worry about a workaholic in your workplace? Well, they run the obvious risk of burnout. In addition, they can become sleep deprived, leading to clumsiness and accidents. Stress, anxiety, and ailments such as carpal tunnel syndrome and high blood pressure are also common among workaholics and can have a negative impact on performance and attendance.

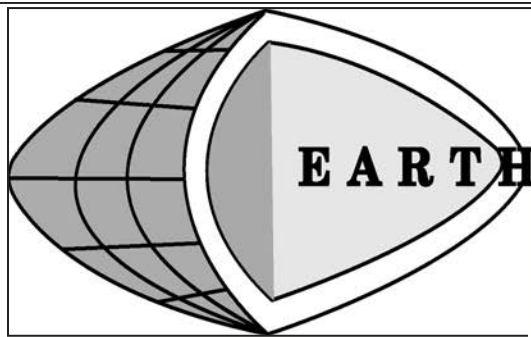
Workaholics Anonymous is an organization modeled after Alcoholics Anonymous to offer fellowship, support, and resources. Their website (<http://www.workaholics-anonymous.org/>) offers an assessment tool to help determine if you are a workaholic.

- Do you get more excited about your work than about family or anything else?
- Are there times when you can charge through your work and other times when you can't?
- Do you take work with you to bed? On weekends? On vacation?
- Is work the activity you like to do best and talk about most?
- Do you work more than 40 hours a week?
- Do you turn your hobbies into money making ventures?
- Do you take complete responsibility for the outcome of your work efforts?
- Have your family or friends given up expecting you on time?

- Do you take on extra work because you are concerned that it won't otherwise get done?
- Do you underestimate how long a project will take and then rush to complete it?
- Do you believe that it is okay to work long hours if you love what you are doing?
- Do you get impatient with people who have other priorities besides work?
- Are you afraid that if you don't work hard you will lose your job or be a failure?
- Is the future a constant worry for you even when things are going very well?
- Do you do things energetically and competitively including play?
- Do you get irritated when people ask you to stop doing your work in order to do something else?
- Have your long hours hurt your family or other relationships?
- Do you think about your work while driving, falling asleep, or when others are talking?
- Do you work or read during meals?
- Do you believe that more money will solve the other problems in your life?

This information is reprinted courtesy of :
 Workaholics Anonymous
 World Service Organization
 PO Box 289
 Menlo Park, CA 94026-0289
 Email: wso@workaholics-anonymous.org
 phone: 510-273-9253

If you answer "yes" to three or more of these questions you may be a workaholic. You can consult the resources found at their website for help in rebalancing your life!



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MEETING MINUTES

Attendees: Officers: Closs, Samol, SanFilippo, Scofidio
Board Members: Cartwright, Colucci, Masse, Mooney
Call to Order: President Marco Scofidio called the meeting to order at 6:05pm

Committee Reports

Advertising: Frey wants to change their ad in the newsletter. Will be updated for June edition.
Audit: No report
Bowling: Successful year. Banquet was on 4-24-15 and it was over the top. Tonawanda Bowling Center gave a 300 decorated bowling pin to the two who received perfect games.
Bylaws: No report
Education: No report
Endowment: No report
Entertainment: We need to have more events, monthly if possible. Send the board your ideas.
Fundraising: No report
Golf: No report
Historian: No report
Media: Job postings on web. Encourage employers/employees to connect.
Newsletter: No report
Nominating: No one has been interested in running for board positions.
Scholarship: No report
Scholarship Run: Meeting 5-18-15 at the Ukrainian Cultural Center. Were given verbal okay to use the boat harbor and new shelter. Paperwork still to be submitted. Will parking fee be waived?
Sunshine: No report
Y Membership: Max Smith sent an email to UB student life regarding ESB table in student union/science building for fall. Waiting for email back. Max will also ask about meetings on campus and other events that ESB can be involved in.
Minutes: The minutes of the April meeting were reviewed and approved
Adjournment: The meeting adjourned before 7pm
Next Meeting: Monday June 8, 2015 Wendt Corporation 2555 Walden Ave, Buffalo NY

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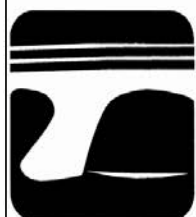
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Giving Freight Rail Tracks a Boost

By Scott Gordon

The big chunks of rock - crushed limestone or dolomite that engineers call ballast - that keep railroad tracks in place look like a solid footing even as freight cars rumble overhead. But temperature and vibration can destabilize ballast over time, keeping it from safely transferring the weight of a loaded train to the soil below, draining water, and preventing vegetation from crowding the tracks.

In Wisconsin, a booming industry mining sand used by oil and gas drillers in hydraulic fracturing has presented a new challenge: fine grains of sand can leak from rail cars, accumulate in rail bed ballast, and during a rainstorm turn into mushy, track-loosening mud. "Some of these tracks have deteriorated so much that the trains travel at about 10 mph," says Dante Fratta, professor of civil and environmental engineering and geological engineering at the University of Wisconsin-Madison. "You have to lift up the track, remove the ballast, and put in new material. It's very expensive. It's also very expensive to have derailments."

Fratta will spend part of the spring examining these problems along a section of freight track in northern Illinois with colleagues Tuncer Edil, emeritus professor of geological engineering and civil and environmental engineering, and Jim Tinjum, professor of geological engineering. While frac sand poses a relatively new challenge in the Midwest, the three researchers hope to bolster the nation's freight rail network against all manner of stresses that cause this particular problem, known as ballast fouling.

Fratta plans to install fiber optic cable in a section of track to monitor temperature, deformation, and vibration in the ballast as well as any corresponding deformation in the tracks themselves. Damage and deformation often occur within a small area of the rail bed. Fratta wants operators to have a better handle on how problems arise, giving them a better idea of how to target repairs to rail infrastructure in more cost-effective ways.

Edil is partnering with the soil stabilization and pavement lifting company

Uretek to devise a system to inject polyurethane to shore up damaged or potentially weak sections of ballast. Unlike cement, liquid polyurethane is great at seeping into the voids between rocks. And while cement can take weeks or even months to set properly, polyurethane injections can set within 15 minutes. The group still has to make sure polyurethane injection is the most cost-effective and energy-efficient approach. "This has to beat the standard way of fixing the problem," Edil says. Producing less replacement ballast would mean using fewer fossil fuel resources, but making polyurethane also uses energy, so Edil and Uretek have conducted a life cycle analysis to determine whether, in the long run, their process actually reduces greenhouse gas emissions and energy consumption.

Tinjum is coordinating the academic and industry teams involved, ensuring that researchers have crucial access to railroad infrastructure. For obvious reasons, railroad companies don't let just anyone experiment on their tracks, so building relationships and delivering results are important on a project like this. "Whenever you do something for the first time, you want it to work, because you need that experience and that trust for future development," Tinjum says.

If the engineers' pilot projects pay dividends on the tracks that carry freight out of Wisconsin, the group would like to apply its concepts to other vulnerable points in railway infrastructure. Railroad tracks take a beating at bridge approaches - where the weight of a train is transferred between surfaces with differing physical properties - and at intersections with roads, where tracks deal with the stress of trains and the weight of other vehicles.

Since injection tools have been previously used to level runways and sidewalks, Tinjum thinks they can translate well into railways. "The immediate huge application is the remediation or improvement of the capacity of these intersections for them to last longer," he says.


Scott Gordon can be contacted via email at Gordon@engr.wis.edu.



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Junk Warriors...Task Completed

Our annual Adopt-A-Highway Cleanup went off without a hitch on April 25. It was a wonderful day, not too hot and not too cold! Our ESB Junk Warriors were thanked by passing motorists and given huge hugs by a woman living along the cleanup route. A big thank you to those who participated!



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Concrete Canoe

The annual National Concrete Canoe Competition, hosted by the American Society of Civil Engineers (ASCE), will be held at Clemson University from June 20 to 22. Now in its 27th year, the competition pits teams of civil engineering undergraduates against each other in four categories: paddling, an oral presentation, a technical paper, and the final product.

Prior to 1988, several smaller, non-affiliated competitions between schools were held. The events were so popular that ASCE formed a committee to organize the competition nationally and the first National Concrete Canoe Competition was held in East Lansing, Michigan. In 1989, ASCE established a permanent subcommittee to ensure that it would be held annually. Last year's winning team was from the University of Nevada, Reno.

According to ASCE, the objectives of the competition are:

- To provide civil engineering students an opportunity to gain hands-on, practical experience and leadership skills by working with concrete mix designs and project management.

- To increase awareness of the value and benefits of ASCE membership among civil engineering students and faculty in order to foster lifelong membership and participation in ASCE.
- To build awareness of the versatility and durability of concrete as a construction material among civil engineering students, educators, practitioners, as well as the general public.
- To build awareness of concrete technology and application among civil engineering students, educators, practitioners, as well as the general concrete industry.
- To increase awareness among industry leaders, opinion makers, and the general public of civil engineering as a dynamic and innovative profession essential to society.
- To generate and increase awareness of ASCE's and national sponsors' commitment to civil engineering education among civil engineering students, educators, practitioners, as well as the general public.

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Mini Maker Faire Comes To Buffalo

By Tara Pfarner

Touted as “the Greatest Show (and Tell) on Earth”, Maker Faire is coming to Buffalo. The event, started by the editors of Make magazine a decade ago, is a family friendly gathering of invention, creativity, and resourcefulness which celebrates the Maker movement. According to the Maker Faire website, the event is “part science fair, part county fair, and part something entirely new.” Makers of all ages, backgrounds, and skill sets ranging from tech enthusiasts to crafters to homesteaders to scientists gather to show what they are making and share what they are learning. The Maker culture, a technology-based offshoot of do-it-yourself culture, often includes engineers and like-minded types with pursuits such as 3D printing, robotics, electronics, and the use of CNC tools in addition to the more traditional crafts of wood and metalworking.

The original Maker Faire event, held in San Mateo CA last year, showcased 1100 makers and saw attendance of 130,000.

Another main event, the World Maker Faire in New York City, is now in its fifth year and is expecting over 600 makers and 75,000 guests. Larger “featured” Maker Faires are held at various locations around the world including Detroit, Orlando, Paris, Rome, Oslo, Tokyo, and Shenzhen. Over 120 smaller, independently organized Mini Maker Faires are also held around the United States including right here in Buffalo. Our local Faire will be held on June 6 at the Buffalo Museum of Science from 10am to 4pm. This year’s local event received nearly 100 applications from people looking to display and demonstrate their projects, and organizers are now working to accommodate this overwhelming response. Last year, the Faire hosted over 50 Makers and 2,300 visitors and is growing by leaps and bounds! Visit <http://makerfairebuffalo.com> for more information.

Tara Pfarner can be contacted via email at tara@rjrpc.com.



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'Bridge' Term	Clue
1. _____ Your Bridges	Make decisions that cannot be changed in the future
2. _____ Bridge	Trick-taking card game
3. A Bridge Too _____	1977 Sean Connery & Ryan O'Neal film
4. Golden _____ Bridge	San Francisco landmark
5. The 59th Street Bridge Song (Feelin' _____)	1966 Simon and Garfunkel song
6. The Bridge on the River _____	1957 William Holden & Alec Guinness film
7. _____ Bridge Is Falling Down	Nursery rhyme
8. The Bridges of _____ County	1995 Clint Eastwood & Meryl Streep film
9. A Bridge To _____	Bridge where one or both ends are broken or incomplete
10. _____ Bridge	US-Canada Niagara Falls connector
11. Bridge _____	Tire company and PGA Tour invitational tournament
12. Bridge To _____	1977 Katherine Paterson children's fantasy novel
13. _____ the Bridge	1992 Red Hot Chili Peppers song
14. The Bridge _____ Out	1965 Warner Mack song
15. _____ under the bridge	Something that has happened and cannot be changed

Answers Below

Just in case you can't figure it out?

1. Burn 2. Contract 3. Far 4. Gate 5. Groovy 6. Kwai 7. London 8. Madison 9. Nowhere 10. Rainbow 11. Stone 12. Terabithia 13. Under 14. Washed 15. Water



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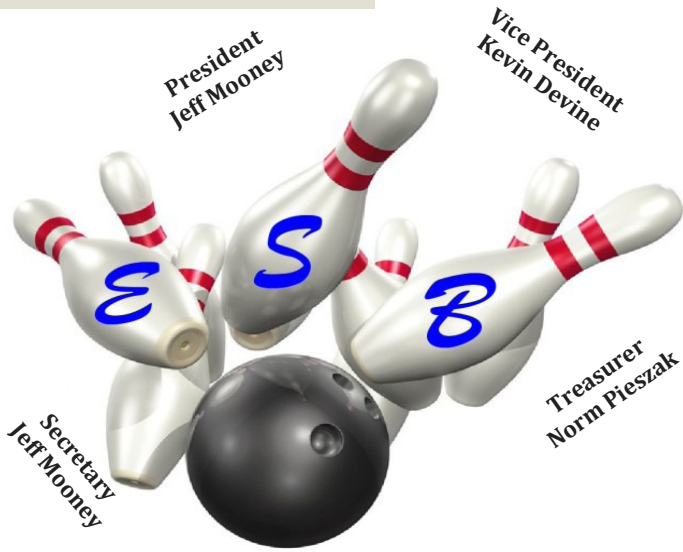
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Team Standings Week 33		Won	Lost
1.	THE KEGGLERS	172.5	124.5
2.	SABER	171	126
3.	DUMBLEDORES ARMY	167.5	129.5
4.	JUNKYARD DOG'S	164	133
5.	AVERAGE JOE'S	161	136
6.	OUTCASTS	161	136
7.	AZZ CLOWNS	161	136
8.	MESSY HOSE	160.5	136.5
9.	SPLIT HAPPENS	158.5	138.5
10.	DEAD LOADS	153	144
11.	ODIES	150	147
12.	K & M TREATS	144.5	152.5
13.	CAD/CAMS	133.5	163.5
14.	PROTRACTORS	114	183
15.	TRANSMITTERS	107	190
16.	ARCHER IMAGING	97	200

Scratch Game

Scott Hummel 300
Hannah Mosher 300

Most Improved Averages

Bob Handley 157 to 178.8
Julia Hay 174 to 184.8

Scratch Series

Tom Mann 731

Handicap Game


Jim Rago 322

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When: Tuesday August 4, 2015
 9:00 am Registration & Open Practice Range
 10:00 am Shotgun Start

Where: Chestnut Hills Country Club
 1330 Broadway Darien, NY

Fee Includes: 18 Holes of Golf with cart, Bucket of Balls on Driving Range,
 Lunch at the Turn, NY Strip Steak Dinner, Contests,
 Awards, Prizes, and Beverage Cart during play

Questions: Email Jeff Wach at jwach@egwpersonnel.com



Golf Tournament Registration

Captain / Player 1: _____
 Company: _____
 Address: _____
 Phone: _____
 Email: _____

Mail your check (payable to ESB) at:
 The Engineering Society of Buffalo
 C/O Jeff Wach
 1700 Clinton St
 Buffalo, NY 14206
 716-826-4233

Please register me for:

\$360 Foursome - Other golfer names _____

\$190 Twosome - Other golfer name _____
 \$100 Single Golfer _____
 \$30 Dinner Only – Name(s) _____

\$_____ Total Enclosed



Golf Tournament Sponsorship



2015 ESB Annual Golf Tournament in conjunction with BEAM (Buffalo Engineering Awareness for Minorities)
Sponsorships are tax deductible!

- Titanium Sponsor - \$1000**
 Display of your business banner, tee box sign, and a foursome in the tournament
- Platinum Sponsor - \$500**
 Display of your business banner, tee box sign, and a twosome in the tournament
- Gold Sponsor—\$250**
 Your business name displayed on a tee box sign and a single player in the tournament
- Silver Sponsor—\$150**
 Your business name will be displayed on a tee box sign

Business Name: _____ Phone: _____
 Individual Name: _____ Email: _____
 Address: _____
 City: _____ State: _____ Zip: _____

Thomas Edison Lab

By Richard T Cartwright PE, CHMM (Fellow), CPIM (Fellow)

Thomas Edison National Historical Park located in West Orange, New Jersey is one of my “101 Places Engineers Must Visit Before They Die!” According to the US National Park Service, this is “Where Modern America Was Invented.” When I was 10 years old, Thomas Alva Edison was one of my heroes. As a role model, I wanted to be like him when I grew up. America’s greatest inventor, who changed our world forever, influenced me to select professional engineering as my life’s work.

Visiting Thomas Edison’s home and laboratory was a step back in time. There, machines were run by belts & pulleys and music was played on phonographs. As a prolific inventor, with 1093 US patents, Edison developed many devices that greatly influenced life around the world, including the phonograph, the motion picture camera, and a long-lasting, practical, electric light bulb. Edison was one of the first inventors to apply principles of mass production and large-scale teamwork to the process of invention, and because of that, he is often credited with the creation of the first industrial research laboratory.

In 1887, the “Wizard of Menlo Park” relocated his laboratory to West Orange, NJ where he built a work space ten times larger than his previous laboratory. The new complex itself was revolutionary: It was one of the first research and development labs, at one time filled with 10,000 employees from around the world. Edison had his researchers work in teams - as opposed to the lonely scientist we may imagine - and his concept of taking an invention from idea to distribution in one place was unique.

A recently completed \$13 million renovation intended to preserve the collection has made it more accessible. The top two floors of the main lab building are now part of the experience, and more of the collection is on view. The place to start is the visitor center (formerly the physics lab) for a brief orientation video. Then, head to the main lab building, walking past the very clock where Edison punched



Photo by Jim.henderson

in. To the right is the dramatic three-story library, a highlight of the tour. Here, employees researched projects and Edison entertained visitors amidst his many awards and honors. You might notice a cot that Edison’s second-wife, Mina, installed in the library for nights when the man who preached “there is no substitute for hard work,” never punched out.

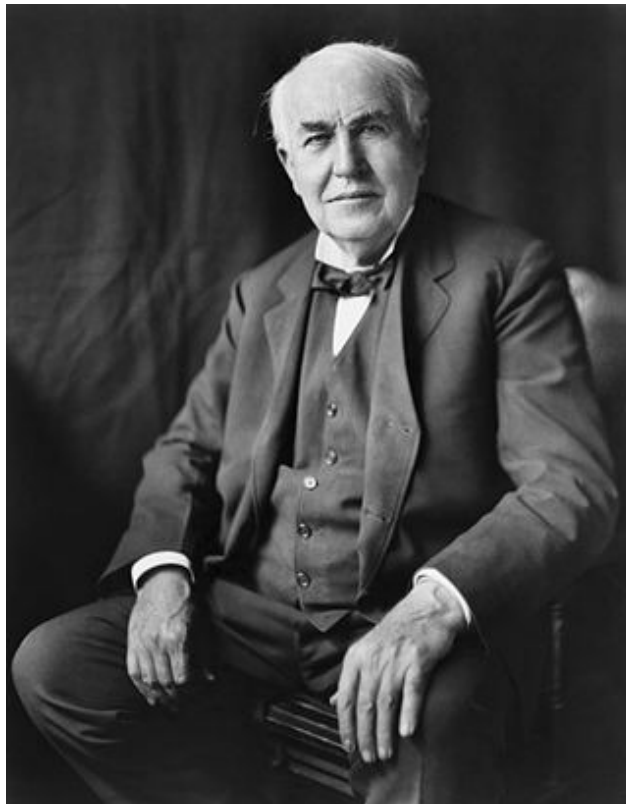


Photo by Louis Bachrach, Bachrach Studios, circa 1922 and restored by Michel Vuijsteke

A summary of Edison’s contribution to the engineering profession is found at www.thomasedison.com. "He led no armies into battle, he conquered no countries, and he enslaved no peoples... Nonetheless, he exerted a degree of power the magnitude of which no warrior ever dreamed. His name still commands a respect as sweeping in scope and as world-wide as that of any other mortal - a devotion rooted deep in human gratitude and untainted by the bias that is often associated with race, color, politics, and religion."


ESB Board Member, Rich T Cartwright PE, is an internationally recognized motivational speaker and blogger on hazardous materials management and environmental engineering topics. Comments on this article and bucket list suggestions for inclusion in “101 Places Engineers Must Visit Before They Die!” can be sent to richcart0725@gmail.com.



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Golfers at a tournament at Myakka Pines Golf Club in Englewood, Florida were undeterred by a large gator on the green, estimated to be twelve feet long. Mickie Zada, the club's general manager, was quoted as saying "If we stopped playing because of alligators, we'd never have golfers," We have our weather here in Buffalo. Let's let Florida keep the giant alligators.

You don't have to be an engineer to participate in our golf tournament or scholarship run. Come join us for two great events!


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