WNY engineer

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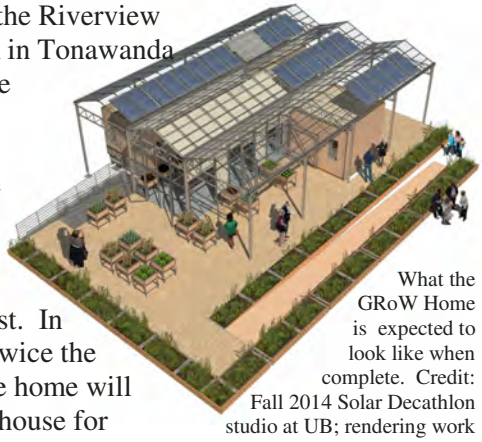
NEWS

News Blurbs Now! (NBN)

Media were invited to the Riverview Solar Technology Park in Tonawanda on March 24 to visit the construction site of the GRoW Home, an 1100 square foot solar house being built by UB students for the US Department of Energy Solar Decathlon Contest. In addition to producing twice the energy it consumes, the home will include a sizable greenhouse for growing food year round. In October, the finished structure will be shipped to Irvin, C for the competition. Learn more at http://grow.buffalo.edu/design/



What the GRoW Home is expected to look like when complete. Credit: Fall 2014 Solar Decathlon studio at UB; rendering work by Nate Heckman, Michael Tuzzo and Duane Warren.

Jones Edmunds & Associates, Inc is in search of a project manager.

The Construction Exchange of Buffalo is hosting OSHA 10 and 30 Hour Construction, Intro to Blueprint Reading, Confined Space for Entrants, Trenching/Excavation Safety, and Forklift Safety courses in April. Visit www.conexbuff.com for info.

The Niagara Frontier Section of the International Society of Automation will be presenting their EXPO 2015 Morning of Education on April 21 at the Marriott Inn in Amherst. Seminars include "Automation 201 - Strategies" by Tom Gilmartin of RJR Engineering; "Steam Traps Operation" by Joel Lemke of Rosemout; and "Explosion Proof Design" by Friedrich Purkert of the ISA Niagara Frontier and attendees can earn 1.5 PDH. Visit http://www.isa-niagara.org/events for more information.

Fifty years ago, a NASA astronaut decided that he wanted to smuggle a sandwich into space. After only one bite, the sandwich was discarded as crumbs were floating everywhere. The mission was designed to test some of the new space food but astronaut John Young wanted to try two day old corned beef sandwiches as well. In 1981 when John Young commanded the first flight of the space shuttle, more corned beef made it's way back into space.

Ever wonder what a bridge demolition would look like condensed into less than a minute? Watch a Utah construction crew demo an overpass in 32 seconds at https://www.youtube.com/watch?v=OmbT5GJA4Ho&feature=player_embedded.

Russia is developing a tank called the Kurganets BMP-25 infantry fighting vehicle that can choose its own targets and is also an amphibious personnel carrier. It will participate in a May 9th Victory Day parade in case anyone is planning a vacation soon.

Picone Construction Corp has completed renovations to the Parish Commons at 656 Elmwood Avenue. After a devastating fire in 2007, it was first transformed from a burned out church to a medical facility. Continuing the look and feel of this unique medical space, the Parish Commons has continued to be transformed. The architect is Tommaso Briatico Architects.

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.

PRESIDENT'S MESSAGE

Are You Up To The Grand Challenge?

Let face it, the news can be a downer some times. How many times in the last five years have you heard about problems with poverty, hunger, lack of drinking water, climate change, economic depression, terrorism, availability of energy, global population, infectious diseases, armed conflicts, and proliferation of nuclear weapons? It seems like mankind is racing natural and manmade problems for its own survival. Is mankind's greatest challenge just to survive ourselves?

Back in 2008 a panel of eighteen engineers, technologists, and futurists (the likes of Google co-founder Larry Page and genomic pioneer J. Criag Venter) spent a year pondering this very issue. What emerged from this group was not the answer but a list of the fourteen greatest engineering challenges of the 21st Century that, if met, would greatly improve our chances to survive and would be "essential for humanity to flourish". The list known as the "14 Grand Challenges for Engineering" was issued by the National Science Foundation in 2008.

What are they?

* Make solar energy affordable
* Provide energy from fusion
* Develop carbon sequestration methods
* Manage the nitrogen cycle
* Provide access to clean water
* Restore and improve urban infrastructure
* Advance health informatics
* Engineer better medicines
* Reverse engineer the brain
* Prevent nuclear terror
* Secure cyberspace
* Enhance virtual reality
* Advance personalized learning
* Engineer the tools for scientific discovery

As Charles M. Vest, President of the National Academy of Science said at the time, "Success with any of them could dramatically improve life for everyone." For those of you with some spare time, or know a person brighter than the noon day sun, the fourteen grand challenges await. The answers are out there waiting to be found and engineered. For those interested in more information, visit www.engineeringchallenges.org.

Marco Scofidio PE
ESB President
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CALENDAR OF EVENTS

04-13-15	6pm	Ways and Means Meeting	2555 Walden Ave, Buffalo (Wendt Corp)
04-13-15	7pm	Directors Meeting	2555 Walden Ave, Buffalo (Wendt Corp)
04-21-15		ISA Tech Expo	Marriott Inn, Amherst
04-25-15	10am	Adopt A Highway	Corner of Colvin & Brighton, Tonawanda
05-03-15		WNY Invention Convention	1 Lafayette Square, Buffalo (BECPL Central)
05-18-15		ISA Tour Yahoo Data Center	Lockport
05-??-15		ESB Election/Member Night	
06-01-15		ESB Scholarship Applications Due	
07-22-15		ESB 5K Scholarship Run	

NEXT BIG ESB EVENTS

Junk Warriors

Give back to the community

Meet other members

Get some fresh air

Continue the tradition that started in 1999

Very simple, two hour commitment

Email ESB1894@gmail.com to let us know that you are interested in helping cleanup our stretch of Colvin Boulevard in Tonawanda. Meet in the Family Video parking lot (Colvin & Brighton) on April 25 at 10am. It takes only about two hours and then we can grab some Tim Horton's!

ESB Needs You

We are seeking candidates to run in the ESB yearly election which typically occurs in May. Would you be interested in becoming a director on the board of The Engineering Society of Buffalo? Gain leadership experience. Craft the future direction of the society. Create lasting business relationships. The board meets monthly typically on a Monday evening.

Know who would be perfect for the board? YOU!

Contact Ron Papaj at rpapaj@aptechsearch.com or 716-635-0290 to find out how to get your name on the ballot. No experience is required.

TECHNICAL ARTICLE

Smarter Smart Grids

By Karen Green and Aaron Dubrow

Smart grids (power grids that adapt to changes in demand and reconfigure as needed to avoid overloads and other problems) can reduce energy costs, help avoid blackouts, and deter cyber attacks. They also pose new challenges. As power generation shifts from centralized power stations to distributed, heterogeneous systems, massive amounts of sensor data from stations must be transmitted efficiently and it needs to be effectively analyzed in real time.

A team led by researchers at North Carolina State University, with partners from the Renaissance Computing Institute (RENCI) at University of North Carolina at Chapel Hill and the University of Illinois at Urbana-Champaign, are using cloud computing resources to analyze smart grid data from thousands of sensors, called phasor measurement units or PMUs. The PMUs are distributed across the transmission grid and connect a wide range of energy generating plants including wind turbines and solar panels. The research is funded by the National Science Foundation's (NSF) Cyber-Physical Systems program and leverages resources developed through another NSF project called ExoGENI, part of the Global Environment for Network Innovations.

Led by RENCI, the ExoGENI testbed combines computation, storage, and network capabilities with open cloud computing and dynamic circuit fabrics to address complex scientific and network engineering problems. Through ExoGENI, the researchers linked real-time sensor data to on-demand virtual computing resources at ExoGENI nodes across the US. Sensors collected as many as 120 data points per second; high-speed networks with guaranteed bandwidth connected the data to computing resources at many sites; each site provisioned a slice of virtual machines; and the virtual machines ran algorithms to analyze and visualize the data in real time.

This process--which is currently only available using the GENI infrastructure--could someday evolve into the standard method for monitoring and troubleshooting smart grids. "We want to show how processing, analyzing, and monitoring power system data can be done using a distributed architecture instead of traditional centralized methods," said Aranya Chakrabortty, an assistant professor and principal investigator on the smart grid project.

The project launched in 2013 as an experimental system for monitoring and analyzing the status of power grids in real time. At the 2013 US Ignite Application Summit, the researchers demonstrated a proof-of-concept experiment showing how GENI can be used to transmit sensor data. At the Smart Future 2015 Summit, they will implement more complex algorithms that allow sensor data to be used to monitor grid instabilities.

The work was recognized at the 2013 and 2014 US Ignite Application Summits for best application in the energy and sustainability sector.

"The advancements in the science of distributed sensing, communications, and cloud computing architecture, demonstrated by ExoGENI, will also play a critical role in building smarter transportation infrastructures and efficient manufacturing systems," said NSF Program Director, Kishan Baheti.

The team is currently in the process of extending the testbed to a completely closed-loop sensing and control system for wide-area control of power grids. In collaboration with the University of Southern California's Information Sciences Institute, the team is launching a project to detect and initiate action in cases of cyber attacks on the grid.

"As the number of phasor measurement units in the North American grid grows exponentially over the next five years, such a distributed data processing architecture will become imperative for monitoring and control, and eventually for initiating actions to solve problems," Chakrabortty said.

Karen Green of Renaissance Computing Institute can be reached at kgreen@renci.org and Aaron Dubrow may be contacted at adubrow@nsf.gov. This article appears at http://www.nsf.gov/discoveries/disc_summ.jsp?cntn_id=134487&WT.mc_id=USNSF_1.

APRIL BIRTHDAYS

Dan Troy PE

Keith Harlock PE

Aaron Lange

Robert Haungs II

Chad R Dugas PE

Peter J Romano Jr

Kenneth M Janusz

Bob Smith

David Debo PE

Jerry Stevens

STUDENT INFO

5 Tips For Young Engineers

By Sasha Gurke

Don't you wish you could turn back the clock and apply the lessons you've learned later in life to the decision you made earlier in your career? Well, if you're a new engineer, here's your chance. We collected advice from experienced engineers, asking what they wish they knew when they were just starting an engineering career. Interestingly, much of the advice was not about technical skills or specific projects.

It's primarily around the need for lifelong learning. Today's workforce looks very different than it did a few decades ago. Young professionals no longer stay at one job for 30 or more years – the average tenure in 2012 was closer to five years, according to the US Bureau of Labor Statistics. Young engineers come into the workforce with a broad set of skills but there is always something new to learn and it's wise to value the advice of senior colleagues.

Here's what we learned:

1. Find a Mentor
It may seem obvious, especially in an advice article, but having a more experienced role model available to support career development was a theme among the advice we received. As in all industries, having someone who inspires you to do better and who pushes you to be your best will keep your career on the right path.

"Look at your superiors and how they exercise leadership. Consider engineers that you admire and add their strengths to your own portfolio. (For) those engineers you do not admire, note their weaknesses and avoid repeating them."– Ian Shields, Group Captain, Royal Air Force, retired

2. Learn How to Manage People
Building an arsenal of professional skills outside the boundaries of engineering programs can significantly increase an engineer's value to the organization. At the top of the list of skills is managing people – especially other engineers.

"The underlying technology and science for engineering solutions is evolving so quickly that very few people can keep current, but there will always be people coming forward with new skills, understanding, and enthusiasm. The secret is to recognize your duty as a successful young engineer and develop your skills as a manager in an engineering business so you can create the conditions for the next generation of engineers."– Systems engineer with 30+ years of experience in the defense industry

3. Ask Questions
Remember the saying that "it is better to remain silent and be thought a fool than to open one's mouth and remove all doubt?" Don't believe it. It's dangerous, especially for engineers. Asking questions forces us to consider all the options. It extends our comfort zone and helps us to grow.

"There is no such thing as a stupid question. I've sat in meetings where the most senior directors of a company have picked holes in engineering designs by asking the most basic of questions. They've taken things right back to the start and made sure the whole design fits together. Through simple, seemingly stupid questions, I've witnessed them uncover major issues with designs. The power of simple questions is amazing. If something isn't clear, ask about it." – Chris Walker, a Systems Engineer in the defense industry

4. Don't Stop Learning
Smart, young engineers recognize that a diploma is just the first step in a career that will require constant education and a fair amount of re-education. A continual stream of learning for young engineers is required for success.

"University education was the beginning. You now have the study tools and confidence to continue learning as a professional." – James Latty, PhD, PE, Chief Engineer, JAL Engineering

5. Keep Up on Other Engineering Disciplines
Innovation in engineering can often come from unexpected quarters. While the trend toward specialization is not likely to let up, the need for cross pollination of engineering disciplines is critical. Innovations in oil and gas engineering can directly impact aerospace engineering, for instance, and new materials used in one industry can benefit others. Young engineers need to keep up-to-date on as many industries as they can.

"Not only keep up with trends in your own discipline, but also in adjacent disciplines. Engineering disciplines cross pollinate each other more than ever before and being on top of that gives you a strong edge in your career growth." – Venu Venugopal, VP of Product Management and Engineering, Knovel

With younger generations of engineers' access to a significant amount of information, the way they research may be quite differently than those nearing retirement. Multiple information search engine platforms are available at their disposal to search for anything from basic equations to advanced technical material. Now more than ever, young engineers have access to overwhelming amounts of data that can enhance their careers. They are expected to sift through mounds of information to learn and obtain the best possible answer to their query, while still addressing their daily responsibilities.

While having 30+ years of experience in the field is a definite advantage, having a good role model, an expanded skillset, fearless question asking abilities, and continual education doesn't hurt much either.

This article appears at http://www.ecnmag.com/blogs/2014/02/5-tips-young-engineers-experienced-engineers and is reprinted with permission.

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.

Date	Hours	Location	Information	Cost
All	2.0	Online	ASME Standards and Certification	Free
All	1.0	Online	Role of Mobile Water Treatment to Offset Emergency/Schedules Plant Shutdowns	Free
03/30/15	1.5	Webinar	Consideration for the Selection of Continously Reinforced Concrete Pavement for Projects	$89
03/30/15	1.5	Webinar	Dynamically Loaded Machine & Equipment Foundations-A Design Primer	$349
03/31/15	1.0?	Webinar	Efficient Pump Selection and Control	Free
03/31/15	1.0	Webinar	MSE Wall Design with TENSARSOIL Software	Free
03/31/15	1.5	Webinar	AWC's 2015 Special Design Provisions for Wind & Seismic-Overview & Changes	$275
04/01/15	1.5	Webinar	Pothole Patching: One More Time	$89
04/02/15	2.0	Webinar	Debt Finance Practices Surface Transportation: Current Issues & Research Needs	$89
04/02/15	2.0	Webinar	Lessons From Engineering Disasters	$110
04/07/15	1.0	Webinar	Introduction to Seismic Design of Nonbuilding Structures to ASCE 7-10	$299
04/07/15	2.0	Webinar	FHWA Climate Resilience Pilots: Results from Oregon DOT, WSDOT, Caltrans, and MTC	
04/08/15	1.5	Webinar	Rigid Pavement Preservation Research Results	$89
04/08/15	1.5	Webinar	Checklists to Assist the Structural Engineer During Construction Administration	
04/09/15	1.0	Webinar	Modeling of Capacitive and Resistive Devices	Free
04/09/15	1.5	Webinar	Safety and Financial Impacts of Airport Winter Operations	Free
04/10/15	1.5	Webinar	Evaluating Damage and Repairing Metal Plate Connected Wood Trusses	$349
04/14/15	1.5	Webinar	Achieving Sustainable Transportation through Collaboration	$49
04/14/15	1.5	Webinar	International Climate Resilience: Practices from Denmark, Norway, and more	
04/14/15	1.5	Webinar	Quick Methods for Quality Assurance Reviews	$225
04/15/15	1.5	Webinar	Creative Ways to Consider Funding Future Transportation	$89
04/15/15	1.5	Webinar	Engineering Investigations of Hurrican Damage: Wind Versus Water	$349
04/15/15	1.5	Webinar	Lateral on Open Web Joist: Moment Constructions with Wide Flange in the Weak Axis	$75
04/16/15	1.5	Webinar	Concrete Slabs on Grade: Analysis, Design, and Detailing	$100
04/17/15	1.5	Webinar	Seismic Evaluation & Retrofit Existing Buildings: Overview Changes to ASCE 41-13	$349
04/21/15	1.5	Amherst	Niagara-Frontier EXPO 2015 Morning of Education	$35
04/22/15	1.5	Webinar	Lessons from Failures of Building Envelope	$299
04/23/15	2.0	Webinar	An Introduction to Fire Protection Engineering for Buildings	$110
04/23/15	7.0	Buffalo	Construction Administration For Design Professionals	$255
04/24/15	1.5	Webinar	Strengthening Wood Beams and Joists	$299
04/27/15	12.0	Webinar	8 Sessions: Design of Composite Floor Systems in Steel Framed Buildings	$500
04/28/15	2.0	Webinar	FHWA Climate Resilience Pilots: Results from CT DOT, Maine DOT, NYSDOT, and MassDOT	
04/28/15	1.5	Webinar	Practical Design of Structures for Blast Effects: Design Criteria	$225
04/29/15	1.5	Webinar	New Energy Technologies at Airports	Free
05/05/15	1.5	Webinar	Practical Design of Structures for Blast Effects: Structural Elements	$225
05/06/15	2.0	Webinar	Tools for Analysis of Capacity & Efficient Flow for Roundabout Design Part 1	$99
05/20/15	1.0	Webinar	Approving or Selecting Building Products with Confidence	Free
05/20/15	1.5	Webinar	Floor Deck Design Manual (In partnership with the Steel Deck Institute)	
06/10/15	1.5	Webinar	Lateral on Open Web Joist: Moment Connections with Knife Plates	
07/15/15	1.5	Webinar	Steel Joist Institute Lessons Learned, Do's and Don'ts	
08/19/15	1.5	Webinar	Steel Joist Institute Lessons Learned, Do's and Don'ts	

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Robots At RIT

By Michelle Cometa

The next generation of humanoid robots may walk the halls at Rochester Institute of Technology. Engineering staff from Teknic, a Rochester-based manufacturer of motion control components, are working with students and faculty from MABL - the Multi-Agent BioRobotics Laboratory - in RIT's Kate Gleason College of Engineering on the TigerBot, a humanoid, autonomous robot designed and built by student-engineers in the college. A multi-year project, the focus of the TigerBot development series is to build a near-human scale robot using advanced sensor and motor technologies, and to demonstrate the technology using the TigerBot as a robotic tour guide during RIT open houses for prospective students. The latter emphasis could show K-12 visitors various aspects of engineering through demonstration, said Ferat Sahin, director of the laboratory and faculty adviser to the project teams. "It has been my long lasting dream that we would have a humanoid giving the tours to our prospective students during open house," he said. "There is nothing more valuable than showing prospective students what they can do if they join RIT. I believe this multi-year project will make the whole RIT campus proud when it is completed. We are very thankful to our sponsor Teknic."

Today's robots are being built with increasing dexterity and the ability to adapt to situations beyond programmed, industrial applications. These advances are being addressed through projects such as TigerBot. RIT's TigerBot mimics some human movements with synchronized arms and legs and range-of-motion at its shoulders and hips. Wireless technology and sensors help it move and turn, avoid obstacles, and recover from a forward or backward fall. It also has improved mechanical and electrical systems including inverse kinematics - the algorithm needed to move and orient the robot with the proper angles of its joints.

Since 2012, senior student-engineers designed four humanoid robots, all just under three feet tall, as a means to understand robotic technology design and to test ideas for a successful humanoid implementation. The group, consisting of students from the engineering college's electrical and microelectronic engineering departments, is looking to build a human-scale robot.

"Integration of Teknic's all-in-one brushless servo system, called ClearPath, will be used to provide locomotion of all primary joints of the latest humanoid TigerBot," said Abe Amirana, Teknic's director. ClearPath motors provide closed-loop positioning performance, are more compact in size, reduce overall cabling and wiring, and improve overall electrical efficiency.

"There's a significant amount of design work these students have to accomplish in a short semester, and Teknic is pleased to provide industrial, original-equipment-manufacturer components to help them meet their goals and objectives. Because ClearPath integrates a digital drive, high resolution optical encoder, and motion controller all within a brushless servo motor, engineers and machine designers are relieved of this engineering effort and can subsequently focus on other critical aspects of the project."

Teknic Inc is a high-tech manufacturer of motion control components for OEM machine builders. All engineering and manufacturing assembly is performed in the Rochester area, making Teknic one of the few companies to still produce brushless motors within the US. This news release can be found at http://www.rit.edu/news/story.php?id=51376

Some 'Biodegradable' Plastics Don't Break Down As Expected

Plastic products advertised as biodegradable have recently emerged, but they sound almost too good to be true. Scientists have now found out that, at least for now, consumers have good reason to doubt these claims. In a new study appearing in the ACS journal Environmental Science & Technology, plastics designed to degrade didn't break down any faster than their more conventional counterparts.

Susan Selke, Rafael Auras, and colleagues note that to deal with our plastic waste problem, many countries and local governments have adopted laws, such as single-use bag bans, to deal with increasing amounts of trash. Most plastics end up in landfills, where they sit for decades or longer without breaking down. More recently, some manufacturers now make plastics with additives that are supposed to make the products biodegradable. But the effectiveness of this approach has been unclear. Selke and Auras's team wanted to see if the additives were working under typical disposal conditions.

The researchers evaluated plastics containing five different compounds designed to encourage breakdown. They found no evidence that the additives enhanced biodegradability in compost, under simulated landfill conditions, or when buried in soil for three years. They say their findings have wide-ranging implications for consumers, the environment and the companies that make these products.

The authors acknowledge funding from the Center for Packaging Innovation and Sustainability at Michigan State University.

This news release was published by The American Chemical Society and can be found at http://www.acs.org/content/acs/en/pressroom/presspacs/2015/acs-presspac-march-18-2015/many-plastics-labeled-biodegradable-dont-break-down-as-

Photo by stephendepolo via Flickr CC

How To Deal With Annoying Coworkers By Ford R Myers

Do you work with one or more co-workers who SERIOUSLY annoy you? Is there someone in your office whose habits and behavior patterns just drive you crazy? Whether your coworker talks loudly on the phone with friends, plays computer games, or shops online all day, these sorts of issues occur at almost every company.

Ford R. Myers, career coach, speaker, and author says, "When you're working eight hours a day in close quarters - or even in cubicles – some would say that it's only a matter of time before some of your colleagues will really start to get on your nerves. This problem is much more common than you might think. It's hard to believe that some individuals can be so unaware of how their behaviors are affecting others in the workplace."

How Does This Behavior Impact YOUR Productivity?
Annoying behavior, and the interoffice bickering it often creates, can be costly. If the annoying behavior doesn't stop, it will definitely decrease your productivity. You'll do just about anything to avoid the annoying person, which can keep important work from getting done. You'll be frustrated and grow unhappy on the job so you'll probably start arriving at work later and leaving earlier than usual – which also diminishes productivity.

What Does This Do to Your Morale?
If you can resolve the issue with the perpetrator within a reasonable period of time, your morale shouldn't be affected much at all. But if your complaints go unanswered and nothing is done about the problem, you may become very disillusioned and demoralized. Nobody likes to be in a work situation where they don't feel listened to.

What Can You Do if This Situation Becomes Extreme?
Your best approach will be to diplomatically let your colleague know that some of his or her actions are bothering you. Believe it or not, the other person who is displaying this annoying behavior simply may not be aware of what they're doing. Once he or she hears your complaint, the offending habits may simply stop.

After trying to address the issues directly with the annoying co-worker, if that doesn't work, take your comments to management. At that point, it's really the responsibility of the department supervisor or the senior manager to address these kinds of problems.

"If your complaints continue to 'fall on deaf ears' and nothing changes, try to get transferred to another department or function. And if that doesn't work, it's probably time to look for a new job at a different company," adds Myers.

For more information and other useful tips for achieving career success, visit http://www.getthejobbook.com. Reprinted by permission of Ford R. Myers, a nationally-known Career Coach and author of "Get The Job You Want, Even When No One's Hiring." Download your free bonuses now at www.careerbookbonuses.com.

Things You Never Knew About Aluminum Foil By Tara Pfarner

Earth Day is April 22! In observance, let's take a look at a common household material which is recyclable and has many uses you may not know about: aluminum foil.

* Polishing Silver: Line a deep pan with foil, cover it with cold water, and add 2 teaspoons of salt with your silverware. Chemistry will remove the tarnish. Place a sheet of foil underneath freshly polished silver to deter tarnishing.
* Cleaning Jewelry: Line a deep pan with foil and add hot water and a tablespoon of laundry detergent. Your jewelry will sparkle like new.
* Sharpen scissors by cutting through 4-5 layers of foil several times.
* Tape a four-inch wide strip of foil along the edge of your counters, tables, desks, or dressers to keep cats down. They don't like the noise or texture, and will (hopefully) stay down after one or two attempts.
* Make a three-sided box around the houseplants on your windowsill if they aren't getting enough sunlight.
* Crumple up some foil into a ball and toss it into the dryer with your clothes. The foil acts like a buffer to prevent fabrics from rubbing together and creating static electricity, leaving your clothes static and chemical free without dryer sheets.
* Don't have furniture sliders? Put some foil on the bottom of the furniture legs and move it with ease.
* Make a disposable bowl for the grease that's left over when you cook bacon. Pour the grease in, wait for it to harden, ball it up, and toss it out.
* Reflect sun from your windows with a foil barrier to help keep rooms cooler.
* Use a ball of foil to clean the grill if you can't find your wire brush.

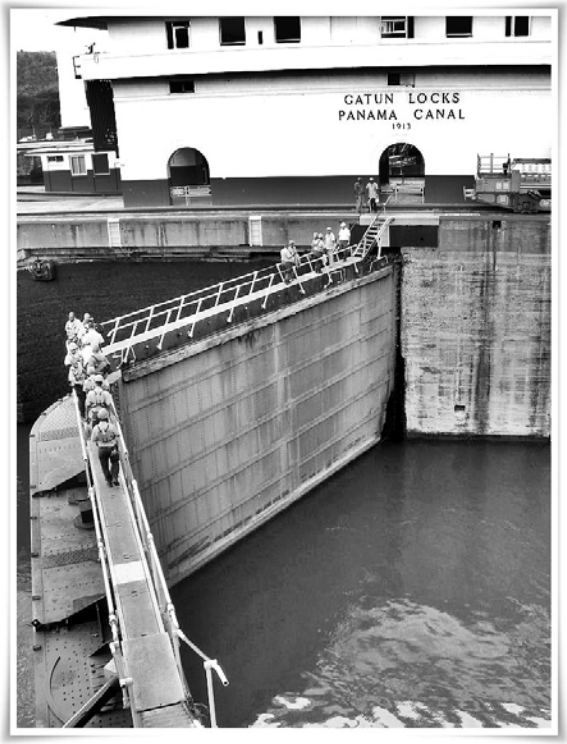
Save time when you iron by putting a long strip of foil on top of the ironing board, underneath the cover. The heat

The Panama Canal

By Jeffrey Scott Taylor

The Panama Canal is a shipping canal in the country of Panama that connects the Pacific Ocean to the Atlantic Ocean. The canal was originally started by the French in 1881. The plan was to build a sea level canal from one side of Panama to the other to provide an easy and efficient trade/shipping route in the Americas. It was a massive undertaking and project for its time. However, the original investors and project managers were plagued by problem after problem. From landslides and flooding to malaria ridden mosquitoes and yellow fever outbreaks, there were an estimated 22,000 lives lost during excavations. The expenses went so far beyond budget that work on the waterway was suspended by 1889. The lead project manager, Ferdinand de Lesseps, was brought up on charges of misappropriation of funding though the ruling was eventually overturned. Then in 1894, the French abandoned the canal all together. The name Panama became synonymous with failure and corruption to the peoples of France.

After the French pulled out of Panama, it wasn't long before the United States took an interest in the waterway. After some political debate and research, the US decided it would continue work on the canal though some major changes had to be made in order to complete it. One change was the support of the American government to the people of Panama in declaring their independence from Colombia. Treaties were signed and relative safety was guaranteed for the new country of Panama. Engineering and safety issues had to be addressed.



New houses and facilities were built along the site. A serious effort was put into the extermination and control of the local mosquito population which, in turn, all but eliminated the spread of disease. There was one major engineering innovation the US made to connect the two oceans. It was decided that the idea of a sea level canal was just too ambitious. They agreed on a plan that was completely dismissed by previous French designers. Lock gates were proposed at each end of the canal to raise and lower ships in and out of the canal. The new plan also incorporated damming a nearby river to create a manmade lake/reservoir. It became known as Gatun Lake. The lake would be used, with gravity, to fill the lock bays and connect the Pacific through the mountains. The US began its work on the canal in 1904 and finished in1914, finally connecting the Atlantic and the Pacific Oceans through the Panamanian tropics.

The United States lost an estimated 3,600 lives during construction. a number far lower that the French estimate of over 22,000 lives lost during their efforts.

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It's been a century since the first ships passed through the Panama Canal. Recent times have called for an expansion in the system of locks and channels to accommodate more and larger vessels. In April of 2006, a plan was proposed to increase the capacity of the Panama Canal to be completed by no later than 2016. Also, it was stated that this would raise Panama to first world status. The project is well underway and for the most part complete. Only a small percentage of construction is still left unfinished. The project put over thirty thousand people to work in and outside of Panama. It took a collaborative effort by people all around the world to expand on an already great feat of human effort. The additional locks and channels have secured many jobs for Panamanian natives and foreigners alike far into the future.

The massive new locks are much different from the original 662 ton, seven foot thick swinging door style gates. The new rolling style gates range from 2,100 to 3,700 tons. They were built by a sub-contractor in Italy in seven different factories, then shipped to the site in Panama for installation. All modern lock systems of similar size operate with the rolling gate system as opposed to the hinged gates of a hundred years ago.

Another major innovation of the expansion project is the new water saving basins. The prior locks are fed water by gravity and the nearby Gatun Lake. Actually raising and lowering the level of the lake as they operate throughout the course of the day. The new basins will hold enough water by themselves to operate the locks efficiently. The water is still fed by gravity into the chambers to raise and lower ships in and out of the canal. However, it will reuse about 60% of its own water, a major improvement from the original design.

Thanks to the vision and effort of so many people, the Panama Canal will now be able to handle ships one and a half times the size of the ships it once serviced and with a major increase in how many ships it can send through the canal in a day. In a fast pace and rapidly growing world, the expansion of the Panama Canal will prove itself to have been a necessary upgrade and a well needed improvement.

Jeff 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 & would like to write song lyrics professionally. Jeff can be reached at jstjr1225@yahoo.com.

Health Conscious Concrete

Skin is renewable and self-repairing – our first line of defense against the wear and tear of everyday life. If damaged, a myriad of repair processes spring into action to protect and heal the body. Clotting factors seal the break, a scab forms to protect the wound from infection, and healing agents begin to generate new tissue.

Taking inspiration from this remarkable living healthcare package, researchers are asking whether damage sensing and repair can be engineered into a quite different material: concrete. Their aim is to produce a 'material for life', one with an in-built first-aid system that responds to all manner of physical and chemical damage by self-repairing, over and over again. Self-healing materials were voted one of the top-ten emerging technologies in 2013 by the World Economic Forum, and are being actively explored in the aerospace industry, where they provide benefits in safety and longevity.

Concrete is everywhere you look: in buildings, bridges, motorways, and reservoir dams. It's also in the places you can't see: foundations, tunnels, underground nuclear waste facilities, and oil and gas wells. After water, concrete is the second most consumed product on earth; ton for ton, it is used annually twice as much as steel, aluminum, plastic, and wood combined. But, like most things, concrete has a finite lifespan. "Traditionally, civil engineering has built-in redundancy of design to make sure the structure is safe despite a variety of adverse events. But, over the long term, repair and eventual replacement is inevitable," said Professor Abir Al-Tabbaa, from the Department of Engineering and the lead of the Cambridge component of the research project.

The UK spends around £40 billion (approximately $60 billion) per year on the repair and maintenance of existing, mainly concrete, structures. However, repairing and replacing concrete structures cause disruptions and contribute to the already high level of carbon dioxide emissions that result from cement manufacturing. What if the life of all new and repaired concrete structures – and in fact any cement-based material, including grout and mortar – could be extended from an average of several decades to double this, or more, through self-healing?

In 2013, researchers in Cambridge joined forces with colleagues at the Universities of Cardiff (who lead the project) and Bath to create a new generation of 'smart' concrete and other cement-based construction materials. "Previous attempts in this field have focused on individual technologies that provide only a partial solution to the multi-scale, spatial and temporal nature of damage," explained Al-Tabbaa. By contrast, this study, funded by the Engineering and Physical Sciences Research Council, provides an exciting opportunity to look at the benefits of combining several 'healthcare packages' in the same piece of concrete.

"Like the many processes that occur in skin, a combination of technologies has the potential to protect concrete from damage on multiple scales – and, moreover, to do this in a way that allows 'restocking' of the healing agents over time," she added. Mechanical damage can cause cracks, allowing water to seep in; freezing and thawing can then force the cracks wider. Loss of

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calcium in the concrete into the water can leave decalcified areas brittle. And, if fractures are deep enough to allow water to reach the reinforcing steel bars, then corrosion and disintegration spell the end for the structure.

The team in Cambridge is addressing damage at the nano/microscale by developing innovative microcapsules containing a cargo of mineral-based healing agent. It's like having a first-aid kit in a bubble: the idea is that physical and chemical triggers will cause the capsules to break open, releasing their healing and sealing agents to repair the lesion. "While various cargo and shell materials have been developed for other applications, from food flavoring and pharmaceuticals to cosmetics and cleaning products, they are not generally applicable to cement-based matrices and are far too expensive for use in concrete, which is why we have needed to develop our own," explained Al-Tabbaa. Another challenge is to make sure the capsules will be strong enough to withstand being mixed in a cement mixer, yet fragile enough to be broken open by even the smallest of fractures. Innovative capsule production techniques are being investigated that can be scaled up to deliver the huge volumes of capsules required for use in construction.

In parallel, the team in Bath is investigating healing at the mid-range micro/mesoscale with spore-forming bacteria that act as tiny mineral-producing factories, feeding on nutrients added to the cement and facilitating calcite precipitation to plug the cracks in the concrete. Different techniques for housing and protecting the bacteria and nutrients within the cement matrix are being investigated, including the capsules that are being developed at Cambridge. The University of Cardiff researchers are engineering 'shape memory' plastic tendons into the cement matrix to close large cracks at the larger meso/macroscale through triggering of the shrinkage of the tendons by heat. The project team is then collectively addressing repeated damage through the creation of vascular networks of hollow tubes, like the circulatory system of a living organism, so that self-healing components can continually be replenished.

As the Cambridge researchers move closer to the best formulations for the microcapsules, they have begun collaborating with companies who can scale up the production to the levels required to seed tons of cement. Meanwhile, the three research groups are also beginning to test combinations of each of their techniques, to find the best recipe for maximum self-healing capability.

By the summer of 2015, with the help of industrial partners, field trials will test and refine the most promising combined systems in a range of real environments and real damage scenarios. This will include testing them in non-structural elements in the Department of Engineering's new James Dyson Building. "This is when it will become really exciting," said Al-Tabbaa. "To be truly self-healing, the concrete needs to be responsive to the inherently multi-dimensional nature of damage, over long time scales. We want concrete to be a material for life that can heal itself again and again when wounded."

This press release was published by the University of Cambridge Communications Office and can be found at http://www.cam.ac.uk/research/features/health-conscious-concrete. It is reprinted under the terms of Creative Commons License.

Through The No-Looking Glass

By Dan Lewis

Frosted glass is a special type of glass which is translucent (that is, light goes through it) but not transparent (objects on the other side can't be seen clearly). While it is sometimes used for decorative purposes, it also has a practical function: it is designed to let light into an area without giving up privacy. But in many cases, that privacy can be undone with a single, readily-available tool: cellophane tape.

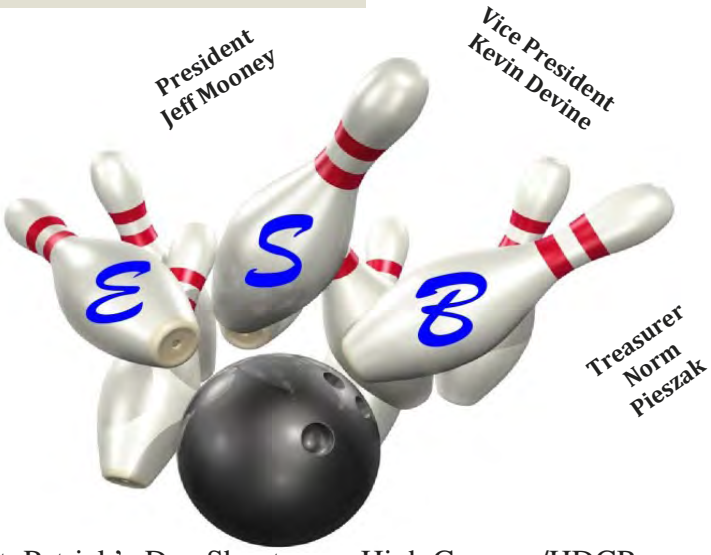
Don't believe me? There is a video online which is pretty straightforward. A person takes a piece of what is often called Scotch tape (due to the predominant brand of cellphone tape), sticks it on the frosted glass, rubs it flat, and like magic, the glass becomes almost transparent - as if it weren't frosted in the first place. But it's not magic. It's science and not all that complicated science at that.

Frosted glass starts off as regular, transparent glass. Via acid etching, sandblasting, or another similar process, one of the sides is riddled with tiny imperfections which are often barely detectable by touch. These bumps and ridges cause the light to scatter as it passes through the glass, leading to the frosted effect. If the bumps weren't there or if they were filled in, the glass wouldn't be frosted.

That's precisely what the tape does. Not much happens when the tape is applied to the frosted glass, at least not immediately. But when the tape is rubbed flat, the adhesive glue fills in all the nooks and crannies, effectively restoring the glass to its original state. Because the tape is transparent (okay, maybe a bit foggy), the frosted glass becomes see-through. When the tape is removed, enough of the adhesive comes off with it such that the glass returns to its frosted state, usually. It may end up damaging the effect somewhat, though.

If you try this yourself it should work fine, but if it doesn't, there's a good reason why - you have to put the tape on the frosted side of the glass, and it's sometimes hard to tell which one that is. And in some cases, the glass is frosted on both sides. In either case, you'll need another piece of tape - one for the opposite side. (And in the case of the double-frosted glass, make sure the tape pieces are lined up!)

This article and a link to the video can be found at http://nowiknow.com/through-the-no-looking-glass/. This has been reprinted courtesy of its author, Dan Lewis. Subscribe to his "Now I Know" email list and learn something new every day!



St. Patrick's Day Shoot		High Game	w/HDCP
1.	Norm Hirschey	317	84
2.	Tim Juliano	285	41
3.	Stan Fularz	279	22
4.	Adam Berg	277	46
5.	Paul Mosher	265	18
6.	Deb Restall	261	84
7.	Paul Morrow	260	17
8.	Scott Hummel	260	11
9.	John Grembowicz	259	1
10.	Jim Finn	258	22

St. Patrick's Day Shoot		High Game	w/HDCP
11.	Steve Koons	257	22
12.	Jason Grembowicz	257	0
13.	Bert Metz	256	62
14.	Ed Kilgore	252	49
15.	Jim Rago	252	26
16.	Chris Marino	252	41
17.	John Campel	250	48
18.	Dick Smentek	250	58
19.	Alan Cook	248	19
20.	Howie Merrill	248	29
21.	Lauri Soos	247	64
22.	Nicole berg	247	94
23.	Alex Urbino	246	33
24.	Chris Gabrielli	246	2
25.	Bob Keichner	245	32
26.	Tim Koons	244	43
27.	Dan Deck	242	97
28.	Jeff Mooney	241	33
29.	Scott Sutherland	239	39
30.	Cloyd Fike	236	31
31.	Tom Gromada	236	34
32.	Sal Puleo	235	30

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Pioneering Women In STEM

By Jessica Arriens and Robert J Margetta

Breakthrough science requires pioneers. People who combine brilliance with courage, even in the face of daunting opposition. The women who paved the way for modern scientific exploration exemplify this spirit; grappling not only with fundamental questions of the universe, but with discrimination and societal constraints that often stripped them of scientific credit. You may know some of those names - Rosalind Franklin, Marie Curie, Ada Lovelace. Here are more, paired with contemporary women doing trailblazing work in the same field with support from the National Science Foundation. This list is by no means comprehensive. Dig deeper into any of these stories and you'll find many more amazing women in STEM.

Also known as the First Lady of Physics, Chieng-Shiung Wu was a Chinese-American scientist who worked on the Manhattan Project where she helped develop a process to produce bomb-grade uranium. Wu helped disprove a then widely accepted law of theoretical physics, called the Law of Conservation of Parity, which said that objects that are mirror images of each other behave the same. Wu led a team whose members experimented with photons, electrons, and a particular type of cobalt atoms to disprove this theory. The experiment was proposed, but not carried out, by two male physicists. In 1957, they (not Wu) won a Nobel Prize for the discovery. Today, Tanya Zelevinsky, who (like Wu in her time) teaches at Columbia, also uses photons, electrons, and atoms to probe fundamental laws of physics.

Annie Jump Cannon cataloged around 350,000 stars in her lifetime, developed the modern stellar classification system, and did it all while working for about 25 cents a day. Cannon was one of many women employed at Harvard College Observatory in the late 1800's, hired under the direction of observatory head Edward Pickering. He reportedly got so annoyed with his inefficient male assistant he said his maid could do a better job. Pickering then hired 24 year old Scottish immigrant, graduate, and mother Williamina Fleming who became a celebrated astronomer. She recruited more than a dozen women to work at the observatory including Cannon. Though generally considered assistants - with low pay and no room for advancement - many made significant contributions to astronomy. Cannon, who was almost completely deaf, was the first woman officer of the American Astronomical Society (AAS). University of Michigan astronomer Sally Oey was recently elected an AAS officer. She researches stellar properties and star formation.

Martha Euphemia Lofton Haynes devoted much of her life to education. She was the first African-American woman in the US to earn a PhD in mathematics and taught for nearly 50 years in the public school system of Washington DC, her hometown. She established the mathematics department at Miner's Teacher's College (now the University of the District of Columbia) and served on DC's Board of Education in the 1960s, where she fought against racial and economic discrimination. The de facto segregation systems in DC schools were abolished while Haynes was school board president. Today, Melvina Jones continues this legacy of promoting science and mathematics education in DC. Jones - winner of a Presidential Award for Excellence in Mathematics and Science Teaching - is a STEM coordinator at DC Public Schools, where she works to encourage the next generation of scientists.

Sarah Frances Whiting "pushed open the doors of opportunity in the various departments of learning," wrote Annie Jump Cannon, one of Whiting's students at Wellesley College. Whiting established a physics lab at Wellesley, the second in the entire country and the first specifically for female students. (The first place X-ray photographs were made in America). She also created Wellesley's astronomy department. At Lowell Observatory in Arizona, astronomer and educator Deirdre Hunter works with teachers and students at Hopi and Navajo schools, inspiring these historically underserved populations to pursue science and engineering. She also involves students in her own research on star formation in dwarf galaxies.

Civil engineer Nora Stanton Blatch was an agitator. So said her first husband, engineer and inventor Lee de Forest in a 1911 New York Times article headlined "Warns Wives of Careers,'" published in the midst of their divorce. De Forest wasn't using the term kindly. He was angry Blatch chose to continue working after she gave birth to their child but the description fits her pioneering career. She was Cornell University's first female engineering graduate, worked for the American Bridge Company and the New York City Board of Water Supply, and was an active suffragette. The descendent of famed women's rights pioneers, Blatch once rode a horse across New York to campaign for a women's right to vote. In 1916, she sued the American Society of Civil Engineers (ASCE) for refusing to admit her as a full member, even though she met all requirements. At the time, women were only admitted as junior members. Blatch lost, and no woman became a full ASCE member for a decade. Like Blatch, Sara Wadia-Fascetti of Northeastern University is a civil engineer with experience in bridge design. Today she researches technologies to better diagnose structural health. Wadia-Fascetti also works to inspire future engineers, especially women and minorities, through NSF-funded programs.

Jessica Arriens can be reached at jarriens@nsf.gov and Robert J Margetta can be contacted at rmargett@nsf.gov. This article can be found in its entirety at http://www.nsf.gov/discoveries/disc_summ.jsp?cntn_id=134386&WT.mc_id=USNSF_1

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