



The University of Tennessee
ASCE Student Chapter

January 22, 2018


JDT 405: 12:20-1:10

Welcome

- Request for membership on Volink to receive emails from us!
- Join us on our Groupme
- Join us on Facebook at The University of Tennessee-American Society for Civil Engineers.
- Follow us on Twitter: @ASCE_UTK



Student Chapter Mission Statement



*Our mission is to volunteer our support
and develop a community that exemplifies
leadership in student engineering.*

General Body Meeting Schedule

Fall Semester

~~August 28, 2017~~
~~September 11, 2017~~
~~September 25, 2017~~
~~October 9, 2017~~
~~October 23, 2017~~
~~November 6, 2017~~
~~November 20, 2017~~

Spring Semester

January 22, 2018
February 5, 2018
February 19, 2018
February 26, 2018
March 19, 2018
April 2, 2018
April 16, 2018



Oak Ridge National Lab

- Melissa Lapsa

JUMP into STEM: Connecting University Students with Innovation

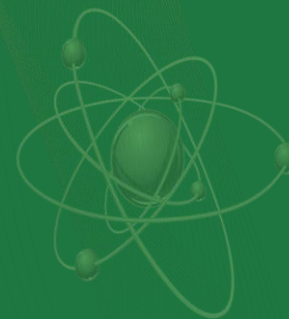
A Pilot Initiative with the University of
Tennessee

Melissa Lapsa

Group Leader, Building Envelope & Urban
Systems Research

ORNL is managed by UT-Battelle
for the US Department of Energy

January 22, 2018



Announcing: JUMP into STEM Pilot



THE UNIVERSITY OF
TENNESSEE
KNOXVILLE

COLLEGE OF
ARCHITECTURE + DESIGN

DEPARTMENT OF CIVIL &
ENVIRONMENTAL ENGINEERING

- Pilot Partnership connecting UT students with **Challenges to advance Research and Design for buildings**
- Opportunity to win a **10 week paid summer internship at ORNL**

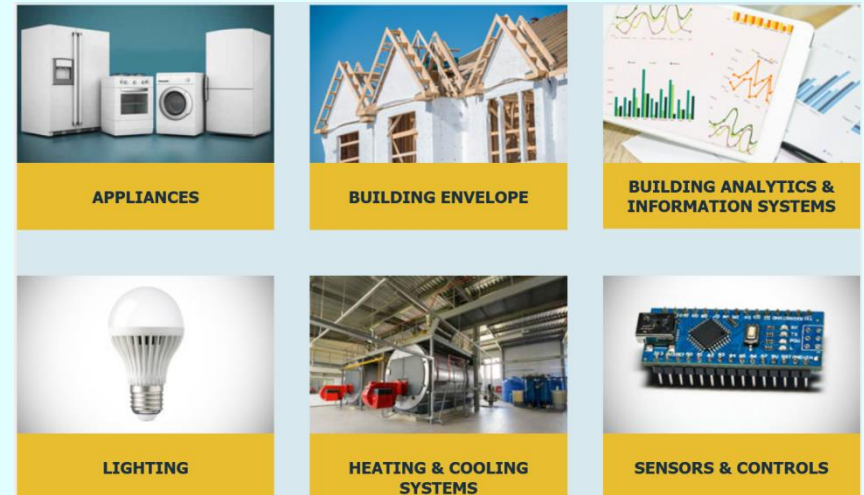
Background: Crowdsourcing for Innovation



Community Driven Ideation

- 18 Partners
- 16 Calls for Innovation
- 225 Ideas
- 17 Award Winners

Topic Areas:



A.O. Smith/ORNL Winner: Benjamin Knopp



Challenge:

Increase the performance of smaller water heaters without increasing water storage temperature.

Lab Lead:

Kyle Gluesenkamp

Solution (Benjamin's was one of 14 submitted):

Embed the cold water dip tube in phase change material within the tank to retain thermal energy.

Activities & Progress

- \$5,000 cash awarded by A.O. Smith.
- ORNL provided \$20,000 worth of materials and technical consultative expertise.
- Benjamin has constructed an initial prototype which shows promising test results.

Outlook:

Benjamin and A.O. Smith plan to collaborate in the construction of a full-scale prototype beginning in 2018.

Lessons Learned:

A case study of what can happen when everything goes right: an engaged and enthusiastic industry partner, a talented and eager innovator and clear intentions and expectations set by all parties.



GE/ORNL Winner: Joe Geddes



Challenge:

Develop a low-cost, R-600a-compatible defrost system for refrigerator evaporators. R-600a exhibits reduced global warming potential and reduces energy requirements.

Lab Lead:

Brian Fricke

Solution (Joe's was one of 7 submitted):

Transfer radiant energy to ice via LED arrays.

Activities & Progress

- \$3,000 cash awarded by GE.
- Successfully demonstrated proof-of-concept via ORNL testing.

Outlook:

Joe and Stephanos are having discussions on how to proceed with collaboration post-JUMP; a CRADA or similar arrangement may be pursued with ORNL as a partner.

Lessons Learned:

Questions related to the legal handling of patents, licensing and other concerns popped up as we prepared to end ORNL involvement in this collaboration. Preparing for these in advance can smooth transitions.



2018 JUMP into STEM: How it works

1. Register: jump.ideascale.com
2. Review JUMP into STEM Challenges
3. Join Information Sessions

1. Get creative, build teams, submit ideas
2. Apply to the HERE Program at ORNL

1. Participate in the JUMP Community: comment, vote, join in the discussion
2. If selected, conduct a 10 week paid summer internship at ORNL*

**Internship Awards are subject to ORNL site access requirements and availability of funding. Students must complete an online application and meet the criteria for the internship program to be eligible to receive the internship. For more information, visit: <https://www.ornl.gov/ornl/hereatornl/>*

Schedule & Events



January 19, 2018: Challenges 1 and 2 Open for UT Students

January 22, 2018: Informational Session at UT John D. Tickle Bldg., 851 Neyland Drive, room 410 at 5:20pm

January 24, 2018: Informational Session at UT Art + Architecture Bldg., 1715 Volunteer Boulevard, room 113 at 5:30pm

February 15 & 22, 2018: Hands-on sessions at UT's Fab Lab, 525 North Gay Street, 3 to 5pm

Jan. 19 to February 11, 2018: Online Q&A submittals accepted

January 19 to March 1: Comments and voting is open to all innovators

March 1, 2018: Challenges 1 and 2 close and Judging process begins

March 2018: Judges select finalists

Late March 2018: Finalist Event at ORNL and Internship Winner Announcement

Get Involved!

jump INTO STEM



The Challenges:

- Exploit 3D printing capabilities to aid design of molds for precast concrete
- Design a bench-top anisotropic composite and a heat sink system for residential walls
- Open Challenge..... *Coming in February*



Visit: jump.ideascale.com

ASCE Student Chapter Goals



- Place Top 3 at Conference
- Increase active members
- Complete Legacy Park project
- Have more involvement for the Knoxville ASCE Younger Member Group

ASCE Conference 2018

WHEN: March 1-3, 2018

WHERE: University of Florida, Gainesville, Florida



Conference Chair: Liliana Porras, lporras@vols.utk.edu

Conference Registration Fee Extension

Due January 29

American Society of Civil Engineers Southeast Student Conference

Mar. 1-3, 2018

Gainesville, FL

Registration Form

School Registration

University Registration: \$200.00

Individual Registration

The contact information on the following page needs to be that of the main point of contact of ASCE student group.

Maximum amount of student competitors is 60 for each school . Every member that registers for the competition must be competing in a competition or a registered Steel Bridge/Concrete Canoe member. In addition to the 60-member student team, faculty and advisors must register. Volunteers do not register on this page.

Individual Student Registration: \$55.00 / (each)

ASCE Membership ID Participant

First/Last Name

Institution

Email

What competition are you competing in?

T-Shirt Size

Dietary Needs

Support Puerto Rico Student Registration

Sponsor Puerto Rican Student Registration : @ \$55.00 / (each)

Register

Competition Information

- Steel Bridge: Salvador Morales smorale1@vols.utk.edu
- Concrete Canoe: James Throckmorton jthrockm@vols.utk.edu



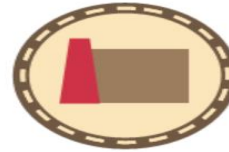
Small Competitions



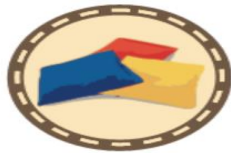
Reading Ranger



Wilderness Water



GeoWall Challenge



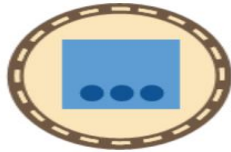
Campy Cornhole



Concrete Canoe



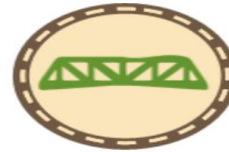
Orienteering



Reinforcement Rodeo



Traffic Trailblazer



Steel Bridge



Horseshoe Hoedown



Dynamic Dam



Professional Paper

Concrete Canoe Pour Day

- Saturday January 27 8:00 -12:00



Fundraising Ideas



Upcoming Events



- January 27: Concrete Canoe Pour Day (8:00-12:00)
- January 29: Conference Registration Due
- January 31: UT vs LSU Basketball Game (6:30)
- February 16: Conference Technical Papers Due
- February 24: ASCE Volunteer Event (TBA)
- February 26: Conference Cookout (12:20-1:10)
- March 1-3: ASCE Southeast Regional Conference
- April 2: 2018-2019 Officer Elections

Special Guest



Erik Knowles
The Rodgers Group

Rogers Group, Inc.



ERIK KNOWLES
SR. ENVIRONMENTAL ENGINEER



Who is Rogers Group?



- <https://www.youtube.com/watch?v=bW1MwFGU4Lo&t=6s>

Environmental Engineering



- Manage Air Permits
- Manage Water Permits
- Perform Site Inspections
- Provide Environmental Training to Employees
- Design water treatment structures
- Develop new quarry locations to ensure environmental compliance



Air Permitting



- 40 CFR Part 60, Subpart OOO – Standards of Performance for Nonmetallic Mineral Processing Plants
- TDEC - APC is Governing Body
- Synthetic Minor permit for Quarries
- Conditional Major for Asphalt Plants



Opacity



- The degree to which light is blocked by emissions
- Measured EPA Method 9
- Determines compliance for all new equipment.
- Must be tested within 180 days from start up.



Process Emissions



- Conveyors
- Crushers
- Screens
- Baghouse Stack
- Wet Suppression is primary control method.



New Source Performance Standards



- Non-NSPS Equipment
 - Manufactured before August 1983
 - NSPS Equipment
 - Manufacture between August 1983 – April 2008
 - New NSPS Equipment
 - Manufactured after April 2008
- No Opacity Limit
 - 10% for Screens and Conveyors
 - 15% for Crushers

 - 7% for Screens and Conveyors
 - 12% for Crushers

Fugitive Emissions



- Blasting Emissions
- Loading Customer Vehicles
- Stockpiling
- Haul road emissions from wind erosion
- Water Truck
 - The cheapest and easiest way to prevent complaints and stay in compliance



NPDES



- NPDES stands for: National Pollutant Discharge Elimination System
- NPDES permit program was created in 1972 by the Clean Water Act.
- Helps address water pollution by regulating point sources that discharge pollutants to waters of the United States.



Water Permitting



- TR-55 Method is used to design treatment structures.
- TN Facilities required to monitor discharge twice per month
 - Total Suspended Solids (TSS)
 - pH
 - Flow
- Reports are submitted to the state Quarterly



Pollution Sources



- Petroleum Storage Areas
 - Leaking Tanks
 - Leaking Hoses/connections
 - Rusted Barrels
- Mine Areas
- Spoil Storage/Stripping Area
- Waste Piles
- Sediment Ponds
- Tracking Out



Best Management Practices



- Check Dam
- Diversion Ditch
- Silt Fence
- Rip Rap
- Stabilization with Mulch
- Vegetative Cover
- *BMP's work best when several are used in a series



Pond Maintenance



- Sediment Removal
 - 50% capacity
- Vegetation
 - Reduces Capacity
 - Banks must be kept clear
 - Potential to source of leaking
- Short Circuiting
 - Flow path should be analyzed
 - Baffles may be needed



Why is This Important?



- Monroe County Stone – August 2005 - \$18,000 fine for failing to maintain proper records.
- Whites Creek Asphalt – September 2006 - \$1,000 fine for excessive fugitive emissions.
- Moulton Asphalt – June 2008 - \$10,000 fine for operating with excessive opacity.
- Hopkinsville Asphalt – July 2010 - \$37,500 proposed fine for failing to submit annual report.



Quiz



1) True or False? Good sediment control results in good erosion control?

A. False

Quiz



2) When visible emissions reduce the appearance of a background to 30% of the original appearance, what is the opacity?

A. 70%

Questions?

