



Bi-State Chapter Exchanger

Volume XXVI, Issue 3

Serving the Hudson Valley and Western Connecticut

November 2012

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Upcoming Events

- **December 12** - ASHRAE Distinguished Lecturer James R. Tauby, P.E. — Seismic Restraint and Vibration Isolation
- **January 9** Acoustics—The Good, the Bad, and the Ugly
- **February 13** - Save the date
- **March 13** - Save the date
- **April 10** - Engineering Design Liability Issues
- **May 8** - Save the date
- **June 12** - Golf Outing

Meeting Wednesday November 14, 2012

Tour of the AERCO Boiler Manufacturer Plant

Come on a tour of the AERCO Boiler Manufacturing Plant in Blauvelt, New York. We will have a guided tour and a presentation (**1 PDH**) on “Re-Thinking Combination Space and Domestic Heating” presented by Sean Dabroski, Regional Sales Manager at AERCO.

The program begins at 6:00 pm, followed by dinner and the presentation.

Cost is \$25.

Please RSVP to John Fusco by Monday, November 12 so we can have an accurate head count for catering.

Email is preferred jfusco@olace.com or 914-919-3178.

Directions from the Tappan Zee Bridge <http://goo.gl/maps/rJT5p>

AERCO International, Inc.

100 Oritani Drive, Blauvelt, NY 10913

Phone: 845-580-8000

President's Message

By John A. Fusco, P.E., LEED AP

I hope this message finds everyone safe and well after Hurricane Sandy's devastating effects on our area. Aside from the personal toll, weak links in facilities' infrastructures were exposed, and I am sure this unfortunate event will bring about changes in code and design in the near future.

Last month's joint meeting with the AIA Westchester/Hudson Valley Chapter at their Design Expo was well received by both chapter members and AIA members, and we look forward to building upon this success next year.

This month we feature a tour and a presentation at the Aerco Boiler Manufacturing Plant in Blauvelt. This should be a great event!

Stay tuned and check for our emails and our website for information on upcoming events.

John A. Fusco, P.E., LEED AP
Bi-State Chapter President

Historical Note — Bob Roston, Bi-State Historian

New Way to Ventilate Skyscrapers

A move in the direction of ventilating tall office buildings has been made by an engineering firm, [which] place[s] in the basement a fan sufficient to produce a plenum condition or a plus atmosphere, in the halls of the building.

Heretofore, the ventilation of offices in skyscrapers has been a serious problem. On the first few floors it is simple; fresh air comes in at the windows and goes out through the transom into the hall. On the top floors an open window results not in an influx of fresh air, but a draft from the hall, of air that has been previously breathed and exhausted by the tenants of lower floors. On intermediate floors the condition is variable.

The new idea involves a fan apparatus that produces an outward flow of air on every floor, and while it is not perfect ventilation, it is likely to produce a great improvement over what has existed in the past.

— The Heating and Ventilating Magazine, October 1904

NYC Skyscrapers Built to Weather the Storm

The recent storm known as Sandy caused unprecedented damage in the New York City area. However, the skyscrapers of The Big Apple largely escaped significant structural damage. That provided evidence to bolster the opinion that they can withstand severe weather events. "The New York City building codes are designed for over 100 mph winds; they're very robust. Tall buildings... get a lot of scrutiny because the consequences of failure would be so extreme," said Tom Scarangelo, CEO and Chairman of Thornton Tomasetti, the engineering firm behind many of the city's recently built skyscrapers, including the New York Times building. However, for people inside the tall buildings, fears could be heightened, because the skyscrapers sway. The swaying is indicative of the building's flexibility — a design element. The main concern, as evidenced by the aftermath of Sandy, is water. Said Scarangelo, "Once water breaches the building envelope and wind gets inside, you have major structural damage."

2014 World Cup Arena to be First Net Zero Energy Stadium

The upcoming 2016 Olympics and 2014 World Cup are leading Brazil to significantly remodel many of its sports facilities. The Estádio Nacional de Brasília, a stadium in the middle of Brazil's capital is becoming bigger and greener. Once its renovations are finished at the end of 2012, it will grow from 42,000 seats to 71,000. The stadium is expected to become the first net zero energy stadium in the world. A ring of solar photovoltaic panels on the roof provides the stadium's power. The stadium will be able to trade energy between the panels and the power grid as necessary. A photocatalytic membrane on the roof will capture air pollution as it falls and breaks down the chemicals, removing them from the atmosphere. Additional sustainability features include rainwater collection and low-flow water fixtures.

Researchers Create 'NanoFlowers' for Energy Storage, Solar Cells

Researchers from North Carolina State University have created flower-like structures out of germanium sulfide (GeS) – a semiconductor material – that have extremely thin petals with an enormous surface area. The GeS flower holds promise for next-generation energy storage devices and solar cells.

“Creating these GeS nanoflowers is exciting because it gives us a huge surface area in a small amount of space,” says Dr. Linyou Cao, an assistant professor of materials science and engineering at NC State and co-author of a paper on the research. “This could significantly increase the capacity of lithium-ion batteries, for instance, since the thinner structure with larger surface area can hold more lithium ions. By the same token, this GeS flower structure could lead to increased capacity for supercapacitors, which are also used for energy storage.”

To create the flower structures, researchers first heat GeS powder in a furnace until it begins to vaporize. The vapor is then blown into a cooler region of the furnace, where the GeS settles out of the air into a layered sheet that is only 20 to 30 nanometers thick, and up to 100 micrometers long. As additional layers are added, the sheets branch out from one another, creating a floral pattern similar to a marigold or carnation.

“To get this structure, it is very important to control the flow of the GeS vapor,” Cao says, “so that it has time to spread out in layers, rather than aggregating into clumps.”

GeS is similar to materials such as graphite, which settle into neat layers or sheets. However, GeS is very different from graphite in that its atomic structure makes it very good at absorbing solar energy and converting it into useable power. This makes it attractive for use in solar cells, particularly since GeS is relatively inexpensive and non-toxic. Many of the materials currently used in solar cells are both expensive and extremely toxic.

7th INTERNATIONAL COLD CLIMATE HVAC CONFERENCE

November 12–14, 2012 | Calgary, Alberta

www.ashrae.org/coldclimate

International applications and innovations in cold climate
HVAC design.



2013 ASHRAE Winter Conference

Jan. 26–30/Dallas, Texas



The 2013 ASHRAE Winter Conference is popular not only for its technical and educational aspects, with its extensive tech program and learning courses, but for the social side of things, too. Reconnect with your old ASHRAE friends from chapters around the world, or make new connections and take advantage of networking opportunities. Kick things off with traditional backyard Texas barbeque at the Welcome Party; catch up with friends before the rush of the week begins. Be sure to find time for a social tour and explore artsy downtown Dallas, wild and western Fort Worth or historic Grapevine. And football fans, don't miss the tour of the Cowboys Stadium! After visiting the AHR® Expo, attending technical sessions and working in committee meetings, wrap up the week at Members' Night Out to reflect on the week and enjoy special surprise entertainment.

If you are interested in Conference sponsorship information please contact Greg Martin at gmartin@ashrae.org

Register at www.ashrae.org/dallas

ASHRAE Learning Institute

Seminars & Courses at ASHRAE's Winter Conference and AHR Expo in Dallas, TX

2 WAYS TO REGISTER

Internet: www.ashrae.org/dallascourses

Phone: Call 1-800-527-4723 (US and Canada) or 404-838-8400 (worldwide)

Full-Day Professional Development Seminars

\$485/\$395 ASHRAE Member -- Earn 8 PDHs/AIA LUs or .8 CEUs

The Commissioning Process in New & Existing Buildings

Saturday, Jan 26 – 8:00 a.m. to 3:00 p.m.

Complying with Standard 90.1-2010

Tuesday, Jan 29 – 9:00 a.m. to 4:00 p.m.

Data Center Energy Efficiency

Saturday, Jan 26 – 8:00 a.m. to 3:00 p.m.

Energy Modeling Best Practices and Applications: HVAC/Thermal

Tuesday, Jan 29 – 9:00 a.m. to 4:00 p.m.

Healthcare Facilities: Best Practice Design & Applications

Saturday, Jan 26 – 8:00 a.m. to 3:00 p.m.

Half-Day Short Courses

\$159/\$119 ASHRAE Member -- Earn 3 PDHs/AIA LUs or .3 CEUs

Air-to-Air Energy Recovery Fundamentals

Sunday, Jan 27 – 2:00 p.m. to 5:00 p.m.

Commissioning Process & Guideline 0

Monday, Jan 28 – 2:45 p.m. to 5:45 p.m.

Humidity Control: Applications, Control Levels and Mold Avoidance

Sunday, Jan 27 – 2:00 p.m. to 5:00 p.m.

Evaluating the Performance of LEED®-Certified Buildings

Monday, Jan 28 – 2:45 p.m. to 5:45 p.m.

Air-to-Air Energy Recovery Applications: Best Practices

Monday, Jan 28 – 8:30 a.m. to 11:30 a.m.

Optimization of HVAC Systems & Components: Techniques & Real-World Examples

Tuesday, Jan 29 – 9:00 a.m. to 12:00 p.m.

Application of Standard 62.1-2010:

Multiple Spaces Equations & Spreadsheet

Monday, Jan 28 – 8:30 a.m. to 11:30 a.m.

Energy Management in New and Existing Buildings

Tuesday, Jan 29 – 9:00 a.m. to 12:00 p.m.

Combined Heat & Power: Design through Operations

Monday, Jan 28 – 8:30 a.m. to 11:30 a.m.

Avoiding IAQ Problems

Tuesday, Jan 29 – 9:00 a.m. to 12:00 p.m.

Understanding Standard 189.1-2011 for High-Performance Green Buildings

Monday, Jan 28 – 2:45 p.m. to 5:45 p.m.

Designing Toward Net Zero Energy Commercial Buildings

Tuesday, Jan 29 – 1:00 p.m. to 4:00 p.m.

Introduction to Ultraviolet Germicidal Irradiation (UVGI) Systems

Monday, Jan 28 – 2:45 p.m. to 5:45 p.m.

Understanding & Designing Dedicated Outdoor Air Systems

Tuesday, Jan 29 – 1:00 p.m. to 4:00 p.m.

Laboratory Design: The Basics and Beyond

Tuesday, Jan 29 – 1:00 p.m. to 4:00 p.m.

HVAC Design Training

Jan 14-18, 2013 • Jan 30-Feb 1, 2013 (Level I only) • Mar 18-22, 2013 • Jun 3-7, 2013 • Aug 12-16, 2013

HVAC Design: Level I - Essentials

Gain practical skills and knowledge in designing, installing and maintaining HVAC systems that can be put to immediate use. The training provides real-world examples of HVAC systems, including calculations of heating and cooling loads, ventilation and diffuser selection using the newly renovated ASHRAE Headquarters building as a living lab.

HVAC Design: Level II - Applications

Developed by industry-leading professionals, the workshop provides participants with advanced level information about designing, installing and maintaining HVAC systems that can be put to immediate use. Participants will gain an in-depth look into Standards 55, 62.1, 90.1, and 189.1 and the Advanced Energy Design Guides, as well as a range of other HVAC topics including: HVAC equipment and systems; energy modeling; designing mechanical spaces; designing a chiller plant; and BAS controls.

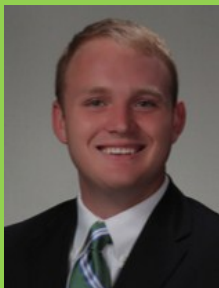
Visit www.ashrae.org/hvacdesign to register



Integrated design is changing the way buildings are designed, constructed and operated; different professionals each bring an important element to the table that results in a successful, sustainable building. Education is no different: Students bring the ambition, ASHRAE offers the financial support, and together they create an educational degree that will lay the foundation for a sustainable career.

Please help ASHRAE promote the availability of **more than 20 Society scholarships** for the 2013–2014 school year, available to high school seniors entering college through senior undergraduate engineering students.

- Two High School Senior Scholarships—\$3,000 each
- Three Engineering Technology Scholarships—\$3,000 each
- Six Regional and University-Specific Scholarships—\$3,000–\$5,000 each
- 11 Undergraduate Engineering Scholarships—\$3,000–\$10,000 each



“The support the scholarship provides has relieved an enormous worry about the cost of tuition. The Willis H. Carrier Scholarship has solidified my involvement in ASHRAE and motivated me to work hard to complete my degree so that I can contribute as much to the HVAC&R industry as Willis H. Carrier has.”

Partrick McGrail, 2012-2013 recipient of the Willis H. Carrier Scholarship, secretary of the ASHRAE Kansas State Student Branch

Annual Application Deadlines:

December 1 for Undergraduate Engineering, Regional and University-specific Scholarships.

May 1 for Engineering Technology and High School Senior Scholarships.

Scholarships are awarded for the academic year following the application deadline beginning with the fall semester. For a list of available scholarships, complete eligibility requirements, and an application, visit www.ashrae.org/scholarships

Bi-State Chapter Officers and Governors 2012—2013

Position	First Name	Last Name	Email	Phone	Fax
Officers					
President	John	Fusco	jfusco@olace.com	(914) 747-2800	(914) 747-0453
President-Elect	Michael	Circosta	mjcarmonk@optonline.net		
Vice President	Cliff	Konitz	c.konitz@verizon.net	(845) 297-5864	(845) 297-5864
Secretary	Brendan	Smith	bsmith@lynstaar.com	(914) 741-1290 ext 17	
Treasurer	Dennis	LaVopa	dlavopa@dIFlowTech.com	(845) 265-2828	(845) 265-2745
Governors					
BOG (term ends June 2015)	Terry	Connor	Terry.Connor@jci.com	(914) 593-5223	(914) 593-5201
BOG (term ends June 2015)	Brendan	Smith	bsmith@lynstaar.com	(914) 741-1290 ext 17	
BOG (term ends June 2015)	James	Dolan	jdolan@olace.com	(914) 747-2800	(914) 747-0453
BOG (term ends June 2014)	Steven	Abbattista	sabbattista@olace.com	(914) 747-2800	(914) 747-0453
BOG (term ends June 2014)	Cliff	Konitz	c.konitz@verizon.net	(845) 297-5864	(845) 297-5864
BOG (term ends June 2014)	Joseph	Trongone	jatrong@optonline.net	(914) 741-1290	
BOG (term ends June 2013)	Michael	Circosta	mjcarmonk@optonline.net		
BOG (term ends June 2013)	Dennis	LaVopa	dlavopa@dIFlowTech.com	(845) 265-2828	(845) 265-2745
BOG (term ends June 2013)	Robert	Roston	bob@rostonfamily.com	(914) 761-3364	(914) 761-1811
Chapter Delegate	Brendan	Smith	bsmith@lynstaar.com	(914) 741-1290 ext 17	
Chapter Alternate					
Committee Chairs					
Research Promotion	James	Kolk	jkolk@victaulic.com		
Student Activities	Nicholas	Salomone	nicksalomone@gmail.com		
Membership Promotion	James	Dolan	jdolan@olace.com	(914) 747-2800	(914) 747-0453
Refrigeration	John	Fusco	jfusco@olace.com	(914) 747-2800	(914) 747-0453
Webmaster	Cliff	Konitz	c.konitz@verizon.net	(845) 297-5864	(845) 297-5864
Newsletter Editor	Michael	Gordon	gordonm@emfcontrols.com	(914) 747-1007	(914) 747-1054
Historian	Robert	Roston	bob@rostonfamily.com	(914) 761-3364	(203) 504-7949
Reception	Joseph	Trongone	jatrong@optonline.net	(914) 332-7658	
Administrator	Cliff	Konitz	c.konitz@verizon.net	(845) 297-5864	(845) 297-5864
Golf	Steven	Abbattista	sabbattista@olace.com	(914) 747-2800	(914) 747-0453

Why Be Involved in a Local Chapter?

- Learn about the latest technologies presented in the program sessions
- Attain continuing education credits
- Meet industry associates and discuss local concerns
- Network amongst designers, installers, vendors, educators, in your local area to help improve business for all
- Share experiences with others
- Enjoy a social hour
- Carry out ASHRAE's mission on a local level

To advance the arts and sciences of heating, ventilating, air conditioning and refrigerating to serve humanity and promote a sustainable world.

ASHRAE Region I 2012-13 Executive Committee and Society Contacts

DRC – Director & Regional Chair

Joseph L Furman
Automated Logic
16 Country Way
Wallingford, CT 06492-5356
W: (203)678-2208
joe.furman@automatedlogic.com

ARC – Assistant Regional Chair & Treasurer

Spencer Morasch
Jersey Central Power & Light
331 Newman Springs Rd
Bldg. 3 Suite 325
Red Bank, NJ 07701-5688
W: (732)212-4133
smorasch@firstenergycorp.com

Nominating Committee Member

Emery Otruba, P.E.
Evergreen Engineering
262 Johnson Hill Rd
Hoosick Falls, NY 12090-4615
W: (518)225-2771
eotruba@verizon.net

Nominating Committee Alternate

Russell J Stuber
U & S Services Inc
233 Fillmore Ave Ste 11
Tonawanda, NY 14150-2316
W: (716)693-4490
stuberr@usservicesinc.com

Nominating Committee 2nd Alternate

Darcy A Carbone
Stebbins-Duffy, Inc.
6 Damon Rd
Medford, MA 02155-2903
W: (617)957-2567
dcarbone@stebbinsduffy.com

RVC Membership Promotion

Richard E Vehlou, PE
NYS OGS BU1
33Rd Fl Corning Tower
Albany, NY 12242-0001
W: (518)474-2471
Rev1969@gmail.com

RVC Research Promotion

Chris Phelan
Thermco
228 Scoles Ave
Clifton, NJ 07012
W: (617)957-2567
chrishelan@thermcoreps.com

RVC Chapter Technology Transfer

Alexander Weiss, PE
8 Bergen Beach Pl
Brooklyn, NY 11234-5743
W: (718)251-1154
weisseng@gmail.com

RVC Student Activities

Om Taneja, PhD, Dr.
USDSA
79 Summit Dr
Basking Ridge, NJ 07920-1960
W: (212)264-4465
om.taneja@gsa.gov

Regional Chapter Programs Chair

Peter Oppelt
R.F. Peck Co.
191 Moorland Rd
Rochester, NY 14612-3421
W: (585)227-1720
poppelt@rfpeck.com

Regional Refrigeration Chair

Mark Cambria, PE
M/E Engineering, PC.
433 State Street, Suite 410
Schenectady, NY 12305
(W) 518.533.2171
mcambria@meengineering.com

Regional Historian

Alexander Weiss, PE
8 Bergen Beach Pl
Brooklyn, NY 11234-5743
W: (718)251-1154
weisseng@gmail.com

Regional Electronics Communication Committee Chair & Newsletter Judge

Heather L. Platt, P.E.
SCMC, LLC.
PO Box 1031
Niagara Falls, NY 14304
W: (716)255-1462
HPlatt@SenecaCM.com

Regional Electronics Communication Committee Alternate

Kevin Gallen, P.E.
Gallen Engineering, PC

Regional Representative

Garry N. Myers
WSP Flack + Kurtz
73 Bonnie Way
Allendale, NJ 07401-1127
W: (212)951-2815
Garry.Myers@wspfk.com

Regional Young Engineers in ASHRAE

Cara S Martin
Novus Engineering
25 Delaware Ave.
Delmar, New York 12054
W: (518)439-8235
cmartin@novusengineering.com

Director of Member Services

Carolyn Kettering
ASHRAE
1791 Tullie Circle, N.E.
Atlanta, GA 30329
404.636.8400
ckettering@ashrae.org

Director of Communications and Publications

Jodi Scott
ASHRAE
1791 Tullie Circle, N.E.
Atlanta, GA 30329
404.636.8400
jdunlop@ashrae.org

Notice to business card advertisers:

We are currently accepting business card advertisements for this year's newsletters. The cost of a business card ad is \$125.00. The newsletter is published monthly, September through June (ten issues). That means for \$125.00 (\$12.50 an issue), your business card ad will circulate to approximately 300 recipients a month or an advertising cost of approximately 4 cents/recipient.

If you are interested in placing an ad, please forward a business card and check (payable to ASHRAE Bi-State) to:

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www.olace.com

Engineering Consultant

Bob Roston, P.E.

6 Pilgrim Road
 White Plains, NY 10605-3703

Tel: 914 761-3364
 Fax: 203-504-7949
 Mobile: 914 646-8322
 e mail: bob@rostonfamily.com

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LAWRENCE STURGIS
 EXECUTIVE VICE PRESIDENT

1 PAULDING STREET
 ELMSFORD, NY 10523

PHONE: 914-592-1776
 FAX: 914-592-1904
 e mail: larrysturgis@gmail.com

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Employment Opportunities

Employment ads may be submitted for inclusion in **The Exchanger** as follows:

1. \$100.000 from companies placing ad for one (1) month.
2. \$150.00 from companies placing ad for two (2) months.
3. No charge for members looking for employment.

Scientists Use Crystals in an Electric Field for Cooling

Researchers at the Carnegie Institution have discovered a new efficient way to pump heat using crystals. They performed simulations on ferroelectric crystals—materials that have electrical polarization in the absence of an electric field. The electrical polarization can be reversed by applying an external electrical field. The scientists found that the introduction of an electric field causes a large temperature change in the material, called the electrocaloric effect. The crystals can pump or extract heat, even on the nanoscale, so they could be used in applications such as computer chips to prevent overheating or even meltdown, which is currently a major limit to higher computer speeds.



ASHRAE, founded in 1894, is a building technology society with more than 50,000 members worldwide. The Society and its members focus on building systems, energy efficiency, indoor air quality and sustainability within the industry. Through research, standards writing, publishing and continuing education, ASHRAE shapes tomorrow’s built environment today.

ASHRAE will be the global leader, the foremost source of technical and educational information, and the primary provider of opportunity for professional growth in the arts and sciences of heating, ventilating, air conditioning and refrigerating.

Upcoming Meetings

Month	Date	Promotion	Main Presentation	Tech Session
November	11/14/2012	Membership Promotion	Boiler Manufacturer Plant Tour	
December	12/12/2012	Research Promotion	ASHRAE Distinguished Lecturer James R. Tauby P.E. — Seismic Restraint and Vibration Isolation	
January	1/9/2013	Student Activities	Matthew T. Murello, P.E. of Lewis S. Goodfriend & Associates Acoustics — The Good, the Bad, and the Ugly	
February	2/13/2013	Research Promotion		
March	3/13/2013	Membership Promotion		
April	4/10/2013	Sustainability	Nahom A. Gebre, Esq., P.E. Risk Management Attorney Victor O. Schinnerer & Company, Inc. Engineering Design Liability Issues	
May	5/8/2013	Student Activities		
June	6/12/2013	Student Scholarships	Golf Outing	

U.S. Uses Less Energy Overall, More Renewable Energy

Americans used less energy in 2011 than in the previous year due mainly to a shift to higher-efficiency energy technologies in the transportation and residential sectors. Also, less coal was consumed in the wake of more renewable energy installations, according to the most recent energy data released by Lawrence Livermore National Laboratory. Wind power saw the biggest increase, from 0.92 quads in 2010 to 1.17 quads in 2011. Overall, U.S. energy use in 2011 totaled 97.3 quads, compared to 98 quads used in 2010. The majority of energy use in 2011 was used for electricity generation (39.2 quads), followed by transportation, industrial, commercial and residential consumption. However, energy use in the residential, commercial and transportation sectors decreased while industrial energy use increased slightly.

Manhattan Tower Partially Powered by Energy Storage System

A battery-based, “intelligent” energy storage system has been installed at Barclay Tower, a 58-story luxury residential tower in Manhattan. The system provides 225 kW of power and 2 MWh of stored energy capacity. The system is managed based on market conditions. The network management and control software recognizes price signals and follows building load profiles. It intelligently monitors use to maximize energy savings.

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