



Bi-State Chapter Exchanger

Volume XXVI, Issue 6

Serving the Hudson Valley and Western Connecticut

February 2013

Meeting Wednesday February 13, 2013

Presentation: Common Elements for Designing an Aquatic Center

John McIlhargy, President Mythic Sports Group LLC, will present the elements for designing an Aquatic Center including Enclosure Design, Dehumidification System, Aquatic Components, the "Bubble" of bad air and impact, Air Distribution and Miscellaneous Topics. John McIlhargy started Mythic Sports to advance new ideas in facilities design, development, programming and operations. Prior to founding Mythic Sports, John served for seven years as the Director of the Project Development for USA Swimming where he helped create and implement the Facilities Development Department. He draws upon his many years within the sports, design and aquatics industry as a specialized program manager, engineer, designer and construction manager with the engineering firms of Burrwood Engineering, the Thomas Group and Tetra Tech specializing in sports design and construction as the vice president of development. Tetra Tech Sports was involved in many sports design disciplines from sports arenas, baseball stadiums, sports planning and development worldwide. Over his career John has consulted on over 400 facilities nationally and internationally as a Technical Engineering Consultant, owners' advocate, Construction Manager and Program Manager.

Place: Casa Rina, 886 Commerce Street, Thornwood, NY 10592

Program: 5:30 - 6:00 PM Attitude Adjustment Time

6:00 - 7:30 PM Buffet Dinner

7:30 - 8:30 PM Main Presentation

\$25 Members, \$30 Non-Members

Engineering students: complimentary admission

The general public is invited and encouraged to attend. Walk-ins welcome.

Directions to Casa Rina

From Saw Mill Parkway - North or South

Exit at Marble Avenue - Exit # 27

Make right - continue to second traffic light

Make right onto Commerce Street

Casa Rina is the second house on your left.

Parking is on your right.

For questions about the program email:

John Fusco jfusco@olace.com

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Upcoming Events

- **March 13** - Hydraulic Balancing Seminar
- **April 10** - Engineering Design Liability Issues
- **May 8** - Golf Outing
- **June 12** - LEED building tour

President's Message

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

Daylight is lasting longer, and according to the groundhog, spring should be arriving early. On that note, we hope the weather cooperates for our upcoming meeting Wednesday, February 13, on "Elements for Designing an Aquatic Center," presented by John McIlhargy, President Mythic Sports Group LLC.

Last month we featured a presentation by Matthew Murello, PE of Lewis Goodfriend & Associates on "Common HVAC Noise and Vibration Applications." Thank you to Matt for the informative presentation.

I encourage anyone interested in participating in chapter activities, whether it be participating in a committee for programs, student activities, membership promotion, or in any other capacity to talk to any of our committee chairs or Board of Governors about it. It is a rewarding and fulfilling experience to help promote the industry our careers are focused on.

Please check for our emails and our website for information on upcoming events and to download current and past newsletters.

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

ASHRAE Publishes Revised Filtration Standard; Combines Standard 52.1 and 52.2

A newly revised filtration standard from ASHRAE combines two standards setting the path to improve the technical accuracy of filter testing. ANSI/ASHRAE Standard 52.2-2012, Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size, establishes a test procedure for evaluating the performance of air-cleaning devices as a function of particle size. The publication marks the first time Standard 52.2 has been published combining Standard 52.1, Gravimetric and Dust Spot Procedures for Testing Air Cleaning Devices Used in General Ventilation for Removing Particulate Matter. The standard addresses three air-cleaner performance characteristics of importance to users: the ability of the device to remove particles from the air-stream, the total dust holding capacity with arrestance (weight efficiency) and its resistance to airflow.

1.4 Million Commercial Buildings To Participate in Demand and Response Programs by 2018

Commercial buildings have become increasingly sophisticated in their operations with the adoption of new automation technologies and building management systems. As building owners and operators look for ways to better utilize new tools and equipment in order to achieve greater efficiencies, their interest in demand response (DR) programs is also growing. According to a new report from Pike Research, the number of commercial facilities participating in DR programs worldwide will rise from fewer than 600,000 in 2012 to more than 1.4 million sites by 2018.

"Although DR programs are offered to a broad range of customers, the commercial sector offers a significant opportunity for growth in the DR market," says senior research analyst Marianne Hedin. "With a huge number of buildings and facilities accounting for a substantial amount of electricity consumption, the commercial sector represents a major underserved market."

The increasing use of automated DR (ADR) and open standards-based communications capabilities is enabling utilities, grid operators, and curtailment service providers (CSPs) to not only offer DR to a much broader end user market, but also offer more sophisticated forms of DR programs, such as dynamic pricing and ancillary services, according to the report. The increasing deployment of smart metering installations, which are expected to pick up in the small and medium business (SMB) market segment, will make it considerably easier for businesses and institutions to participate in the economic DR market, where they can take advantage of price-responsive DR programs to obtain reduced rate structures.

The report, "Demand Response for Commercial Buildings," provides a detailed examination of the growing worldwide market for demand response in the commercial sector. The market opportunity and technology issues for DR in commercial facilities are explored, and market drivers and inhibitors are examined. The report also includes in-depth analyses of regional trends and profiles of 19 key industry players, along with market forecasts for load curtailment and revenue, segmented by region and by segment, through 2018. An Executive Summary of the report is available for free download on the [Pike Research website](#).

Research Promotion Contribution Form

PLEASE COMPLETE THE INFORMATION BELOW AND RETURN WITH YOUR CONTRIBUTION TO:

James Kolk
528 Middle Street
North Babylon, NY 11703

Phone: 631-219-8502 Fax: 610-923-3352

Please accept my research investment in the amount of \$ _____

Make checks out to **ASHRAE Research**.

Name _____ Member # _____

Company _____ Chapter Bi-State

Address _____

City _____ State _____ Zip _____

Please check one: Personal contribution
 Company contribution

Charge my gift to: Visa Master Card American Express

Credit Card # _____ Expiration Date _____

Signature _____

Donors are recognized for their contributions as follows:

Honor Roll contributors are listed in the October ASRHAE Journal and receive the commemorative coin recognizing Giants in HVAC&R invention or innovation.

- Individual Honor Roll beginning at \$100
- Corporate Honor Roll beginning at \$150

Investors with contributions of \$250 or more receive a wall plaque that can display six commemorative coins.

Contributions in any amount are gratefully received and 100% of the contribution goes directly to research. All contributions are tax deductible.

New Technology Controls Heat Like Light

An MIT researcher has developed a technique that provides a new way of manipulating heat, allowing it to be controlled much as light waves can be manipulated by lenses and mirrors. The approach relies on engineered materials consisting of nanostructured semiconductor alloy crystals. Heat is a vibration of matter — technically, a vibration of the atomic lattice of a material — just as sound is. Such vibrations can also be thought of as a stream of phonons — a kind of “virtual particle” that is analogous to the photons that carry light. The new approach is similar to recently developed photonic crystals that can control the passage of light, and phononic crystals that can do the same for sound.

The spacing of tiny gaps in these materials is tuned to match the wavelength of the heat phonons, explains Martin Maldovan, a research scientist in MIT’s Department of Materials Science and Engineering and author of a paper on the new findings published Jan. 11, 2013 in the journal *Physical Review Letters*. “It’s a completely new way to manipulate heat,” Maldovan says. Heat differs from sound, he explains, in the frequency of its vibrations: Sound waves consist of lower frequencies (up to the kilohertz range, or thousands of vibrations per second), while heat arises from higher frequencies (in the terahertz range, or trillions of vibrations per second).

In order to apply the techniques already developed to manipulate sound, Maldovan’s first step was to reduce the frequency of the heat phonons, bringing it closer to the sound range. He describes this as “hypersonic heat.” “Phonons for sound can travel for kilometers,” Maldovan says — which is why it’s possible to hear noises from very far away. “But phonons of heat only travel for nanometers [billionths of a meter]. That’s why you couldn’t hear heat even with ears responding to terahertz frequencies.”

Heat also spans a wide range of frequencies, he says, while sound spans a single frequency. So, to address that, Maldovan says, “the first thing we did is reduce the number of frequencies of heat, and we made them lower,” bringing these frequencies down into the boundary zone between heat and sound. Making alloys of silicon that incorporate nanoparticles of germanium in a particular size range accomplished this lowering of frequency, he says.

Reducing the range of frequencies was also accomplished by making a series of thin films of the material, so that scattering of phonons would take place at the boundaries. This ends up concentrating most of the heat phonons within a relatively narrow “window” of frequencies.

Following the application of these techniques, more than 40 percent of the total heat flow is concentrated within a hypersonic range of 100 to 300 gigahertz, and most of the phonons align in a narrow beam, instead of moving in every direction. As a result, this beam of narrow-frequency phonons can be manipulated using phononic crystals similar to those developed to control sound phonons. Because these crystals are now being used to control heat instead, Maldovan refers to them as “thermocrystals,” a new category of materials.

These thermocrystals might have a wide range of applications, he suggests, including in improved thermoelectric devices, which convert differences of temperature into electricity. Such devices transmit electricity freely while strictly controlling the flow of heat — tasks that the thermocrystals could accomplish very effectively, Maldovan says.

Most conventional materials allow heat to travel in all directions, like ripples expanding outward from a pebble dropped in a pond; thermocrystals could instead produce the equivalent of those ripples only moving out in a single direction, Maldovan says. The crystals could also be used to create thermal diodes: materials in which heat can pass in one direction, but not in the reverse direction. Such a one-way heat flow could be useful in energy-efficient buildings in hot and cold climates.

Other variations of the material could be used to focus heat — much like focusing light with a lens — to concentrate it in a small area. Another intriguing possibility is thermal cloaking, Maldovan says: materials that prevent detection of heat, just as recently developed metamaterials can create “invisibility cloaks” to shield objects from detection by visible light or microwaves.

Rama Venkatasubramanian, senior research director at the Center for Solid State Energetics at RTI International in North Carolina, says this is “an interesting approach to control the various frequencies of the phonon spectra that conduct heat in a solid-state material.”

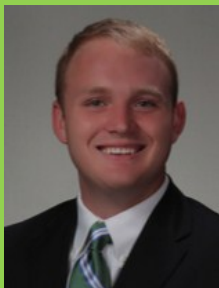
The modeling used to develop this new system “needs to be further developed,” Venkatasubramanian adds. “The theory of what wavelengths of phonons, and at what temperatures, contribute to how much heat transport is a complex problem even in simpler materials, let alone nanostructured materials, and these will have to be factored in — so this paper will trigger more interest and study in that direction.”



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

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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.

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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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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.

New York City Reporting Law Yields Surprising Results

According to data released under a New York City law that tracks energy use in New York buildings, several buildings that are expected to be high performing actually are not. The six-year-old 7 World Trade Center, which is certified LEED Gold, had an ENERGY STAR score of 74. That is just below the minimum of 75 set for high-efficiency buildings by the federal ENERGY STAR program. However, two buildings built in the 1930s, the Chrysler Building and the Empire State Building, had their ENERGY STAR scores increase to 84 and 80, respectively, as a result of extensive renovations to their insulation and mechanical systems. New York City's biggest commercial structures have been required to report energy use since 2010. This is the first year public disclosure has been mandated under a 2009 law.

Employment Opportunities

Energy Modeler

Kohler Ronan, LLC is a leading Consulting Engineering Firm with offices in New York, NY, and Danbury, CT specializing in the design of commercial & institutional projects. The Firm is currently in search of a Building Energy Modeler. Join a high-energy office with a young professional environment. Work side-by-side with industry experts on projects ranging from nationally recognized cultural institutions and museums, to universities and higher education. Be rewarded for independent thought and creative solutions. And most importantly, enjoy the work you do.

This position requires knowledge of energy systems, energy efficiency, renewable energy, and sustainable practices for commercial building systems.

Individual must be familiar with Energy Modeling and Building Simulation software:

- DOE-2, eQuest, Required
- Ecotect, IES-VE, Trane Trace, Carrier HAP Preferred

Applicants must have:

- BS Mechanical Engineering or related field
- Self-Motivated
- Background in building energy efficiency and renewable energy.

Kohler Ronan offers:

- Competitive salary
- Health Benefits
- 401K plan
- Paid Vacation
- Great office atmosphere
- Opportunity to work closely with industry experts
- Summer Hours

More information about the firm can be found at www.kohlerronan.com.

Please send your resume and cover letter to krce@kohlerronan.com.

Mechanical / Electrical Engineers / Project Managers

Kohler Ronan, LLC is a leading Consulting Engineering Firm with offices in New York, NY, and Danbury, CT specializing in the design of commercial & institutional projects. The Firm is currently in search of experienced Mechanical and Electrical Engineers / Project Managers with 5 to 10 years of experience. Join a high-energy office with a young professional environment. Work side-by-side with industry experts and leaders on projects ranging from nationally recognized cultural institutions and museums, to universities and higher education. Be rewarded for independent thought and creative solutions. And most importantly, enjoy the work you do.

Applicants must have:

- BS Mechanical or Electrical Engineering or related field
- PE preferred
- Self-motivated and well organized individual with excellent communication skills
- Experienced background in commercial and institutional projects

Kohler Ronan offers:

- Competitive salary
- Health Benefits
- 401K plan
- Paid Vacation
- Great office atmosphere
- Opportunity to work closely with industry experts
- Summer Hours

More information about the firm can be found at www.kohlerronan.com.

Please send your resume and cover letter to krce@kohlerronan.com.



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
February	2/13/2013	Research Promotion	Elements for Designing an Aquatic Center	
March	3/13/2013	Membership Promotion	Hydraulic balancing seminar	
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	Golf Outing	
June	6/12/2013	Student Scholarships	LEED building tour	

ASHRAE and UNEP Strengthen Global Cooperation, Launch 2013-2014 Biennial Work Plan

ASHRAE and the United Nations Environment Programme (UNEP) have launched their third biennial Work Plan for 2013-2014, based on a global cooperation agreement signed in 2007, at ASHRAE’s 2013 Winter Conference held in Dallas, Texas, recently.

The ASHRAE-UNEP cooperation agreement was developed to achieve several international goals, including the sustainable phase-out of Ozone Depleting Substances (ODS) in refrigeration and air-conditioning applications; maximizing the climate benefits of using zero ODS alternatives including aspects of energy saving in buildings; as well as facilitating the transfer and adoption of suitable technologies in developing countries.

The new work plan covers the 2013-2014 timeframe with an objective of increasing cooperation between ASHRAE and UNEP by transferring relevant technologies amongst different regions and continents. The plan is prepared based on success achieved and lessons learned from the implementation of two previous work plans.

The new work plan includes two main goals and several relevant actions. The first goal, which addresses emissions reduction, long-term refrigerants and energy efficiency in buildings, includes five different actions. These actions address promoting research of long-term refrigerants, building knowledge of specialists about refrigerants through education and certification, developing a specialized guide for refrigeration installations and coordinating efforts in the area of energy efficiency in buildings.

The second goal aims at promoting expertise and technological information exchange to governments and specialists dealing with ASHRAE and UNEP, developing a regional roster of experts, establishing an international advisory team to assist developing countries in instituting/updating relevant standards and codes, as well as developing joint online tools and a forum for partners and stakeholders, allowing for better communication and dissemination of related information.

The ASHRAE-UNEP coordination team will continue its work to oversee sound implementation of the work plan and facilitate the involvement of ASHRAE chapters around the world as well as UNEP regional teams.

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