ASHRAE Philadelphia Chapter

QUAKER CITY CLIMATE

November 2016
Volume 52, Issue 3

INSIDE THIS ISSUE:

COSTS

Fees are based on online reservations and prepayment.

Philadelphia Chapter Members:
$30

ASHRAE Society Members - Non-Chapter Members:
$40

ASHRAE Life Members:
No Charge

Non- ASHRAE Member:
$40

YEA Member (35 & under):
$25

Students:
$10

Thursday, November 10, 2016

Presentation #1

From Big Data to Big Energy Saving - Improving Building Energy Efficiency and Building Human Interactions through Advanced Control, Operation and Data Analytics

presented by

Dr. Jin Wen

Drexel University

Presentation #2

Applying Advanced HVAC Technologies at Johns Hopkins University

presented by

Philip Bartholomew, PE, LEED AP

Miller Remick

Click here to Register

LOCATION

Dave and Buster's

325 North Columbus Blvd.
Philadelphia, PA 19106
215-413-1951

For Directions: click here
Parking: $12 ($5 drink coupon)

5:00 PM to 6:00 PM	Social Hour/Cash Bar
6:00 PM to 7:00 PM	Dinner
7:00 PM to 9:00 PM	Presentations

See the presentation abstracts on page 3 and page 4.

This is Research Promotion Night!

We hope to see you there!

YEA Bowling Night - November 17 - See page 4.

2016-2017

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President's Message

Hey everyone!

I can't believe it is already November, this year is moving quickly already. I hope everyone who could attend had a great time at SMCA's Engineering Night in October, which featured a well-received presentation on airflow management in healthcare facilities. I would like to send out a special thank you to SMCA for hosting an excellent event at the Hotel Monoco.

Our November meeting will be held on the 10th at Dave & Buster's. It is Research Promotion night, where our RP Chair, Gary Debes, will recognize our corporate and individual contributors. We're following the presentation format for this meeting that was well received last year – hosting two local engineers to present on their recent works in the research and technology fields. Our first presentation will be given by Dr. Jin Wen of Drexel University. She'll be updating us on her on-going research related to improving building design efficiency and human comfort with advanced means of control, analysis, and fault diagnosis. Our second presentation features Phil Bartholomew, PE, of Miller-Remick. Phil was awarded the ASHRAE Article of the Year in 2015 for his paper on using a dual duct system in a hospital operating room environment with the goal of saving considerable amounts of energy for the end user. I think both topics are very interesting and relevant as energy use continues to be a large focus, and the engineering community needs to continue developing ideas and methods to address challenges on a daily basis.

I'd like to take a moment to congratulate one of our area members, Bradford Crowley, PE, of Ballinger, for winning the National ASHRAE Technology Award – Educational Facilities, for his work on a project at Johns Hopkins University. You may recall Brad presented on this project at our November meeting in 2015. It is a tremendous honor to receive a national award, and we are proud of Brad's work. He'll be formally recognized at the ASHRAE Winter Conference in Las Vegas on Saturday, January 28, 2017.

Thanks as always for your continued support of ASHRAE. I look forward to seeing you all at our meeting this month.

Casey Younkins, PE
Philadelphia Chapter President
c021@ashrae.net

Thursday, November 10 Meeting

Presentation #1

From Big Data to Big Energy Saving - Improving Building Energy Efficiency and Building Human interactions through Advanced Control, Operation and Data Analytics

Presented by
Dr. Jin Wen, Professor
Department of Civil, Architectural, and Environmental Engineering
Drexel University, Philadelphia, PA

Abstract: In the US, 41% of the primary energy is consumed by buildings. Buildings also account for 74% of the total electricity consumption in the US. Significant improvements have been achieved in increasing building envelope and heating, ventilating, and air conditioning (HVAC) component efficiency. However, building systems, as a whole, are still rather inefficient. Despite the substantial achievements in low-cost sensing, computation, and big data analysis technologies that have been widely adopted in other disciplines, advanced building control, operation, and analytics solutions have encountered many barriers to entry in the building market. Moreover, it is well-recognized that modern buildings are often operated without a good interaction with its occupants, whom a building should serve for. This lack of good interaction results in a poor occupant satisfaction on the built environment. In this presentation, challenges and opportunities exist in improving building energy efficiency and building-human interactions through advanced operation and building data analytics are discussed. Several projects that attempt to improve building energy efficiency, building-grid integration, and building-human interactions through advanced building control, analysis, and fault diagnosis technology development are presented.

Speaker: Dr. Jin Wen is a Professor in the Department of Civil, Architectural, and Environmental Engineering at Drexel University. She is actively involved with teaching and research in the building energy efficiency and indoor air quality areas. She has served as the principle investigator on various building energy efficiency and indoor air quality research and/or educational projects funded by the U.S. Department of Energy, the National Institute of Standard Technology, the National Science Foundation, the Department of Homeland Security, the American Society of Heating, Refrigerating, Air Conditioning Engineers (ASHRAE), and Philadelphia Housing Authority. She has also worked as a control engineer for the Johnson Control Inc before she joined Drexel University. Dr. Wen is currently the Research Subcommittee Chair for Smart Building Systems Technical Committee (TC 7.5) in ASHRAE.

See the next page for information on Presentation #2.

Thursday, November 10 Meeting

Presentation #2

Applying Advanced HVAC Technologies at Johns Hopkins University

presented by

Philip Bartholomew, PE, LEED AP

Miller Remick

Abstract: Hospital operating room HVAC systems require high quantities of circulated air to meet ASHRAE Standard 170 and the non-aspirating flow requirements of the operating room. The typical HVAC system is highly ineffective, in terms of energy use, at maintaining the desirable temperature and humidity conditions in the space. Mr. Bartholomew will discuss his 2015 ASHRAE Article of the Year that demonstrates that a version of a dual duct HVAC system will save considerable amounts of operation energy compared to the standard system.

Speaker: Philip has been practicing mechanical engineering for 39 years and has been a Sr. Mechanical Engineer at Miller Remick for the last 3 years. For the last 7 years he has worked primarily on the health care projects. Before that, he specialized in designing biological high containment and research facilities. He has written two articles for the ASHRAE Journal, Labs 21 as well other periodicals such as Consulting Specifying Engineer. Also, he has presented at four Labs 21 yearly conferences, ISPE, EPA and higher education institutions.

YEA Bowling Night

Sponsored by Blankin Equipment

Thursday, November 17, 2016

6:30 PM to 8:30 PM

Click here to register!

Philadelphia's ASHRAE Chapter invites all members 35 and under (including Students!) to the Young Engineers in ASHRAE (YEA) Fall Social - a night of bowling in South Philadelphia! Please try to get to South Bowl between 6:00 pm and 6:30 pm to get your shoes and lanes. We have reservations for the lanes starting at 6:30 pm, so as people arrive, we can start bowling. There will be appetizers and a full spread of delicious food.

Special thanks to our event sponsor, **Blankin Equipment.**

The cost is $15 for YEA members and $10 for Student members.

South Bowl Lounge N' Lanes
19 E. Oregon Avenue
Philadelphia PA 19148

Please contact Dan Brown at c021yea@ashrae.net if you have any questions or wish to be added to our YEA directory.

ASHRAE Philadelphia Corporate Sponsorships Still Available!

The Philadelphia Chapter invites your company to join as a Corporate Sponsor for the 2016-2017 year. Your firm's participation in this program would enable us to make a wonderful donation to ASHRAE Research Promotion which includes over $ 1.5 million in local research funding.

Corporate Sponsors are listed on our web site, in our newsletter, and in our annual directory. They receive free copies of our directory and recognition at all of our events. With the ease of one payment, you may get all this, as well as free dinner tickets good for our monthly meetings, and make a valuable contribution to ASHRAE Research at the same time.

Since not all companies have the same financial capabilities or quantity of employees, we offer a few different levels of corporate sponsorship. Each level will receive the same types of benefits, with some differences in quantities and discounting.

We hope you will decide to join us as a Corporate Sponsor. If you are interested, please email us at philachapter@mail.ashrae.org. The Board of Governors thanks you for your continued support of ASHRAE. We hope that this year is successful for your firm.

For more information, click here.

The New 2016-2017 Directory is Available!

The latest edition of the Directory of Associations, Consulting Firms, and Manufacturers' Representatives in the Philadelphia Area is now available. It sells for $23 each.

Send your check to Hope Silverman, ASHRAE, 994 Old Eagle School Road, Suite 1019, Wayne, PA 19087.

If you prefer to pay by credit card, please call Hope at 610-971-2169 or email her at hope@mmco1.com.

Future City Competition

It's that time of year again. The school year is off to a great start for the Future City Competition. To date, 40 schools have signed up and have started designing their cities of the future.

Our greatest need at this stage of the competition is for mentors. Each school is assigned a mentor to work with the students and share their real world experiences to help them develop their future city. Just 1 or 2 hours a week can make a big difference in how students approach their project and how they start to address it. The following is a the current list of schools that need mentors:

G.A. Stetson Middle School	West Chester, PA
Great Valley Middle School	Malvern, PA
Holy Family Regional Catholic School	Levittown, PA
Independence Charter School	Philadelphia, PA
JR Fugett Middle School	West Chester, PA
Sacred Heart	Havertown, PA
Southern Middle School	Sinking Springs, PA
St Albert the Great	Huntington Valley, PA
St Mary	Schwenksville, PA
Texas Avenue School	Atlantic City, NJ

Please let me know if you are interested in working with any of the schools listed above. If you'd like to be a mentor but don't see a school in your area, send me an e-mail and I'll keep you posted as schools register.

Please visit our website at www.futurecityphilly.org and "Click here to sign up as a Volunteer" on the top left of the page. There you can register to be a mentor, judge, or general volunteer. We will need judges and general volunteers for the day of the competition, which is schedule for January 21, 2017. It will be held again at Archbishop Carroll High School.

Any questions please contact me via e-mail or phone. Please feel free to forward this e-mail to your friends, co-workers, and

technical society members.

Karen R. McManuels, PE
Philadelphia Regional Volunteer Coordinator

Manager, Operations
Associated Engineering Consultants, Inc.
485 Devon Park Drive, Suite 113
Wayne, PA 19087
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610-688-4566 fax
610-389-5692 cell

PHILADELPHIA CHAPTER PROGRAMS CALENDAR 2016-2017

Date	Location	Topic	Theme
11/10/2016	Dave & Buster's	*Local Engineers Present!* Phil Bartholomew, Miller-Remick - ASHRAE Journal Article of the Year Dr. Jin Wen, Drexel University - Update on Drexel Research	Research Promotion
12/15/2016	Union League	HVAC and Infectious Airborne Diseases	Breakfast Meeting 7:00 AM
1/26/2017	Wells Fargo Center	Flyers vs. Toronto Maple Leafs	Social
2/16/2017	Dave & Buster's	Geothermal Heat Pumps presented by Howard Alderson	Student Night and YEA
3/9/2017	Fisher's Tudor House	Trade Show	
4/13/2017	The Wyndham	Presentation by Rachel McCarthy, CHOP	Students and Membership
TBD		Golf Outing	
5/18/2017	The Wyndham	Presentation by Tom Watson, Daikin	Past President's Night

Program calendar is tentative and subject to change. Please refer to ASHRAE Philadelphia Website for up to date information. Advance registration and pre-payment are required before the meetings.

We need your attendance!
If we are below our guaranteed level for attendees at our meetings, our treasury could be negatively effected. Our programs are designed around the membership's input and we all need to support these meetings to maintain a strong/informed association. We hope to see you at our next meeting. Please come out and support our Chapter!

Did you know there are free design guides available on the ASHRAE web site?
The regular technical article is not the only place to get great free information each month.
Take a few minutes to log on and see the variety of design guides available to download at no cost.
The design guides can be located by using the link below.

https://www.ashrae.org/standards-research--technology/advanced-energy-design-guides

Please submit articles highlighting novel HVAC technologies to Chapter Technology Transfer Committee Chair Eric Feinschil (c021cttc@ashrae.net) for consideration in future newsletters.

Water Remains the "Gold Standard"

Twelve comparisons between hydronics and VRF/VRV systems.

By John Siegenthaler

Reprinted from *Modern Hydronics*, Autumn 2016

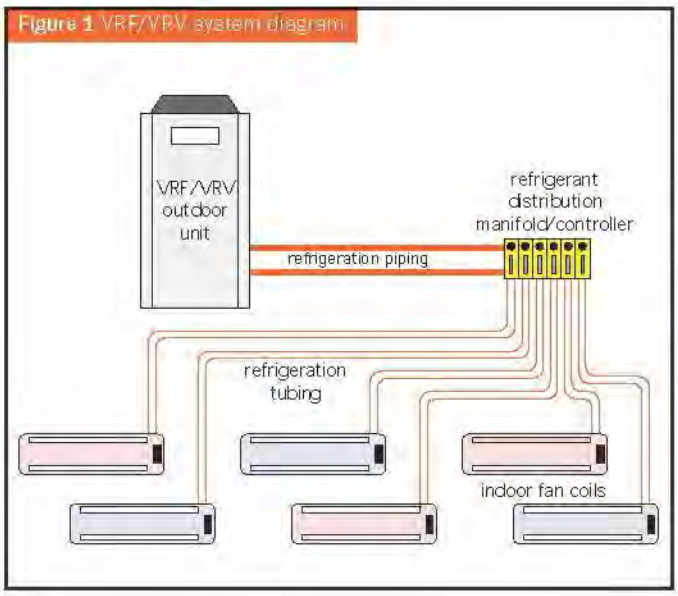
Hydronics technology has long been known for unsurpassed heating comfort.

It has also been used for cooling, primarily through chilled water distribution systems in commercial and institutional buildings. This well-established and highly successful track record is, in part, based on the thermal properties of water. It is also based on the versatility of hydronic systems in adapting to a wide range of applications. No other heat transport material provides the versatility, safety, reliability, energy efficiency, or environmental compatibility of water.

Over the last few years, a new method for moving thermal energy through buildings has appeared on the North American market. This approach uses refrigerant as the transport media throughout a building and is known as either a variable refrigerant flow (VRF/VRV) system, or a variable refrigerant volume (VRV) system.

VRF/VRV systems use multiple interior heating/cooling terminal units that have refrigerant passing through them, as illustrated in *Figure 1*. The refrigerant flow rate through each terminal unit varies depending upon the heating or cooling load that terminal unit is trying to satisfy.

Figure 1 VRF/VRV system diagram



THINKING IT THROUGH

HVAC system designers, architects, and building owners have many choices when it comes to heating and cooling buildings. The choice of system should consider up front cost, operating cost, long-term serviceability, expandability, reliability, safety, and environmental responsibility. With these criteria in mind, let's examine the benefits that modern hydronic systems offer relative to VRF/VRV systems.

BENEFIT #1: HYDRONIC SYSTEMS CAN BE USED WITH MANY ENERGY SOURCES.

Hydronic heating and cooling systems are easily adaptable to a wide variety of current and future energy sources. These devices include boilers fueled by natural gas, propane, or fuel oil, geothermal and air-to-water heat pumps, and renewable energy heat sources such as solar thermal collectors and biomass boilers. Other potential heat sources include waste heat recovery, off-peak thermal storage systems and combined heat and power (CHP) systems.

In some cases two or more of these heat sources can be combined in the same system. They can share the load based on the most favorable operating conditions for each source.

Likewise, many options exist as sources of chilled water for hydronic-based cooling systems. They include chillers and heat pumps operating on standard vapour compression refrigeration cycles, as well as gas-fired absorption chillers, and even water drawn from large/deep lakes.

VRF/VRV systems are solely sourced by electricity.

BENEFIT #2: HYDRONIC SYSTEMS ALLOW FOR SIMPLER FUTURE MODIFICATIONS.

When older commercial or institutional buildings are upgraded, their existing hydronic distribution system, or portions of that system, may be reusable in combination with a new central plant for producing heated and chilled water.

When VRF/VRV systems are used, the existing hydronic piping and all hydronic terminal units must either be decommissioned in place or removed from the building. All new copper

(click here to read the entire article)

The Philadelphia Chapter
of the
American Society of Heating,
Refrigerating and Air
Conditioning Engineers, Inc.

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New Philadelphia Chapter Members

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Justin Miller
Nick Tromba
Judd Vail

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Rohit Subhash Andhare
Kari Donovan
Michael Hellens
John Kipferl
Rick Larson
Leigh Wise

Membership Advancement

If you are currently an ASHRAE Associate Member, becoming a full Member is easier than you think! The following count toward the required **12 points** to advance to full membership status. You must update your ASHRAE online biography and send an email to membership@ashrae.org to advance.

Non-accredited degree = 4 points
Accredited degree = 6 points
PE = 4 points
Industry experience = 1 point/year

ASHRAE Winter Conference
January 28 - February 1, 2017
Las Vegas, Nevada
Click here for more information.