

ASHRAE BLUEPRINT

April 2018



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PRESIDENT'S MESSAGE Stuart Oster

Chapter Meeting: **Wednesday April 4th @**
 The Country Club of Sioux Falls
 Social 5:00, Dinner 5:30, Program 6:00-7:00

RSVP at our Chapter homepage (www.sdashrae.org) asap.
<http://sdashrae.org/meetinginfo.php>.

Chapter Members and Guests,

This meeting will wrap up our formal meetings for the year and it should be a big night. DL speaker Eckhard Groll will present as well as student night where we will present scholarships to the SDSU & MTI ASHRAE student recipients. Let's have a great turnout for our last meeting before summer!

I would also like to note here that Eckhard will be giving a technical seminar from 3:00-5:00, so please make sure you register for that. Cost is \$50 for a CE credit and \$25 for a non-CE credit. The invite has already been sent to all members. Finally, Eckhard will also be giving a presentation to the MTI students earlier in the day, so it will be a busy day for all.

As a last request, I am reaching out to our members to please consider stepping up to fill in our open at-large positions on the BOG. For me, it has been a very rewarding experience to be part of the Board & also Chair several committees over the years.

Don't forget you may utilize our Chapter webpage (<http://sdashrae.org/>) to save future meetings to your calendar. Go to the Events tab, then you can select any of the future meetings which will take you to the link with that meeting's information and an icon to Add to Calendar.

See you all Wednesday April 4th at The Country Club!

-Stu

ASHRAE BLUEPRINT

CTTC Nathan McKenzie

Dr. Eckhard A. Groll is the Reilly Professor of Mechanical Engineering and also serves as the Director of the Office of Professional Practice at Purdue University. He joined Purdue University as an Assistant Professor in 1994 and was promoted to Associate Professor in 2000, to Full Professor in 2005, and to the Reilly Professorship in 2013. He received his Diploma in Mechanical Engineering from the University of the Ruhr in Bochum, Germany, in 1989 and a Doctorate in Mechanical Engineering from the University of Hannover, Germany, in 1994.

Professor Groll teaches Thermodynamics and his research focuses on the fundamental thermal sciences as applied to advanced thermal systems, components, and their working fluids. Since joining Purdue, he has been the principal investigator (PI) or Co-PI on 100 research grants and 46 educational grants with a total budget of approximately \$10.3 million. He has advised 22 doctoral students, 48 master students, 52 undergraduate project students, 67 visiting scholars/visiting research associates, and 9 post-doctoral researchers. Currently, he advises 8 Ph.D. students, 10 master students, 1 Post-Doc, 3 undergraduate project students and 2 visiting scholars/visiting research associates. Dr. Groll has authored or co-authored 103 archival journal articles and 176 conference papers. He has been the co-author of 3 book chapters and the editor or co-editor of 7 conference proceedings. He holds 4 patents. He has given 73 invited lectures/invited seminars and 11 keynote lectures. He serves as the Regional Editor for the Americas for the International Journal of Refrigeration and is a Fellow of the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE).

Professor Groll has been recognized for his academic leadership in higher education. He is a 2010-2011 Fellow of the American Council on Education (ACE) and 2009-2010 Fellow of the Academic Leadership Program of the Committee on Institutional Collaboration (CIC-ALP). He has received numerous awards for his research and teaching excellence including the 2010 E. K. Campbell Award from ASHRAE, his induction into the Book of Great Teachers at Purdue University in 2008, and the 2007 Purdue University Faculty Scholar Award.

Afternoon Presentation:

Technical Seminar: "Update on Refrigerants: Past, Present and Future"

GBCI Approved | 1 CE Hour | 0920010372

AIA Approved | 1 LU/HSW | GROLL01

In recent decades, the refrigeration and air conditioning sciences have been in a state of flux primarily because of the phase-out of ozone-depleting CFC and HCFC refrigerants, and secondarily because of environmental concerns related to the direct global warming impacts of some of the replacement refrigerants. Due to these concerns, there is significant worldwide interest in using substances that are naturally occurring in the biosphere as refrigerants, which are considered benign to the environment and are termed "natural working fluids". Surprisingly, many of these substances were already used as refrigerants at the dawn of the refrigeration technology in the late 1800's. Thus, when looking at the refrigerants of the future, it is essential to understand which substances have been used in past. This presentation provides a detailed review of the past and present refrigerants, and proposes refrigerants and their respective technologies that could be used in the future. An assessment of their characteristics related to choice of one versus another, and an identification of trends set by these choices will be made.

Evening Presentation:

Dinner Meeting: "Recent Research of Novel Compression Concepts for Heat Pumping, A/C, and Refrigeration Applications"

The phase-out of CFC and HCFC refrigerants, combined with advances in compressor technology such as reduced noise and vibration and mechanical capacity control, has motivated the development of novel compression concepts for the refrigeration industry. This paper provides an overview of several new developments for refrigeration, air-conditioning and heat pumping applications, including two novel compressors called the bowtie compressor and z-compressor. The bowtie compressor offers an integrated method of capacity modulation for use in domestic refrigerators/freezers. It modulates the cooling capacity by changing the piston stroke without changes of the clearance volume for better thermodynamic efficiency. The compressor is called bowtie compressor due to its two sector-shaped, opposing compression chambers

forming a bowtie. The z-compressor is a dual-chamber hermetic rotary compressor with opposing upper and lower compression chambers separated by z-shaped blade. The compressor offers significantly lower noise and vibration levels than a conventional rolling piston compressor. In addition to presenting these new compressor types, research on flooded compression, miniature-scale compression, and compression processes with multi-port refrigerant injection will also be presented.

Research Promotion **Kacie Olson**

Thank you to the individuals and companies who have already donated to the 2017-18 Research Campaign! We have raised \$5,580 towards our goal of \$12,700. The BOG will soon be placing calls to all those who have not yet donated in an effort to help us reach our goal. Please consider giving, even if it's a small amount, as it all adds up!

Government Affairs **Kasey Abbott**

A bill was signed on March 26, updating existing SD law to now reference the 2018 International Building Code, instead of the 2015 International Building Code. The Bill is attached at the end of this newsletter.

Special Events **Kevin Eggert**

The ASHRAE Golf outing this year will be held May 25th at the Brandon Golf Course.

Membership **Nathan Larson**

If you know of anyone that may be interested in joining ASHRAE, be sure to tell them about ASHRAE and invite them to a meeting. Membership information can be found at www.ashrae.org/members/ or call Nathan at 605-996-7548 with questions.

YEA (Young Engineers in ASHRAE) Blake Lynch



There were (6) of us in attendance for the YEA event at Escape 605. It was a first for all of us, so we were a little unsure of what to expect. The escape room we participated in was called Amnesia, which is based on the movie “The Hangover.” Our setting was a hotel suite, with all sorts of combination locks and clue’s spread throughout the room for us to unlock. There were about 18 clues that we had to find, and the first 5 clues were found within the first 10 minutes. After that was stalled out, and had to ask for a clue to proceed. We made it to the final clue, but unfortunately we ran out of time and were unable to escape within the 60 minute timeframe. Overall, it was a great experience for everyone and I think all of us would do it again.



The 2017-2018 South Dakota Chapter ASHRAE Line-up:

| | | |
|----------------|-----------------------------|--|
| Sept 20 | Noon | Jay Eldridge, Daikin <i>"Chiller System Optimization"</i> |
| Oct 11 | Noon | Scott Blackmon, Hart&Cooling/AMPCO <i>"Factory Built Chimney"</i> |
| Nov 8 | Afternoon Technical Seminar | Victor W. Goldschmidt, Ph.D., Purdue University Of Mechanical Engineering (Distinguished Lecturer) <i>"Leadership Principles"</i> |
| Nov 8 | Evening | Victor W. Goldschmidt, Ph.D., Purdue University Of Mechanical Engineering (Distinguished Lecturer) <i>"Air Conditioning: A Look Into the Past and a Guess Into the Future"</i> Past President and Student Night, RP Awards |
| Dec 6 | Noon | Bruce Barrett, Multistack <i>"Variable Speed Scroll Compressor Technology"</i> |
| Jan 10 | Noon | Jeffery Schmidt, City Planning & Zoning Official <i>"Growth and Development of Sioux Falls"</i> |
| Feb 17 (Sat.) | Valentines Event | Worthing Olde Towne Dinner Theatre <i>"Nana's Naughty Nickers"</i> |
| Mar 7 | Noon | Kevin Holtberg, Power Products & Services, Inc. <i>"Metering 101"</i> |
| April 4 | 3:00-5:00 Seminar | Eckhard A. Groll, Dr. Eng., Purdue University (Distinguished Lecturer) "Update on Refrigerants: Past, Present, and Future" |
| April 4 | Evening | Eckhard A. Groll, Dr. Eng., Purdue University (Distinguished Lecturer) "Recent Research of Novel Compression Concepts for Heat Pumping, A/C, and Refrigeration Applications" Student Night |
| May 25 | | <i>Golf – Brandon Golf Course</i> |

AN ACT

ENTITLED, An Act to revise certain references to the International Building Code.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF SOUTH DAKOTA:

Section 1. That § 11-10-5 be amended to read:

11-10-5. If the governing body of any local unit of government adopts any ordinance prescribing standards for new construction, the ordinance shall comply with the 2018 edition of the International Building Code as published by the International Code Council, Incorporated. The governing body may amend, modify, or delete any portion of the International Building Code before enacting such an ordinance. Additional deletions, modifications, and amendments to the municipal ordinance may be made by the governing body and are effective upon their adoption and filing with the municipal finance officer. Additional deletions, modifications, and amendments to the county ordinance may be made by the governing body, and are effective upon their adoption and filing with the county auditor. No ordinance may apply to mobile or manufactured homes as defined in chapter 32-7A that are constructed in compliance with the applicable prevailing standards of the United States Department of Housing and Urban Development at the time of construction. No ordinance may require that any fire sprinkler be installed in a single family dwelling. No ordinance may apply to any specialty resort or vacation home establishment as defined in chapter 34-18 that is constructed in compliance with the requirements of Group R-3 of the 2018 edition of the International Building Code.

Section 2. That § 11-10-6 be amended to read:

11-10-6. The design standard for any new construction commenced after July 1, 2018, within the boundaries of any local unit of government that has not adopted an ordinance prescribing standards for new construction pursuant to § 11-10-5 shall be based on the 2018 edition of the International Building Code as published by the International Code Council, Incorporated. Each local unit of

government may adopt an ordinance allowing local administration and enforcement of the design standard. The provisions of this section do not apply to new construction for any one or two family dwelling, mobile or manufactured home, townhouse, or farmstead and any accessory structure or building thereto. For purposes of this section the term, farmstead, means a farm or ranch, including any structure or building located on the land. The provisions of this section do not apply to any mobile or manufactured home as defined in chapter 32-7A that is used for purposes other than residential that is constructed in compliance with the applicable prevailing standards of the United States Department of Housing and Urban Development at the time of construction if the structure complies with applicable accessibility standards for the occupancy intended. The provisions of this section do not apply to any specialty resort or vacation home establishment as defined in chapter 34-18 that is constructed in compliance with the requirements of Group R-3 of the 2018 edition of the International Building Code.

Section 3. That § 11-10-11 be amended to read:

11-10-11. If the governing body of any local unit of government adopts any ordinance prescribing standards for maintenance of existing structures and premises, the ordinance shall comply with the 2018 edition of the International Property Maintenance Code as published by the International Code Council, Incorporated. The governing body may amend, modify, or delete any portion of the International Property Maintenance Code before enacting such an ordinance. Additional deletions, modifications, and amendments to the municipal ordinance may be made by the governing body and are effective upon their adoption and filing with the municipal finance officer. Additional deletions, modifications, and amendments to the county ordinance may be made by the governing body, and are effective upon their adoption and filing with the county auditor. However, no ordinance may impose standards that conflict with the applicable prevailing standards of the United States Department of Housing and Urban Development at the time of construction for

manufactured homes as defined in chapter 32-7A.