



#MyASHRAE, #YourASHRAE, #OurASHRAE

Let me tell you about #MyASHRAE. This June marked my 6th year as an ASHRAE member, and looking back at when I first joined, I would never have expected where this path would have taken me.

When I joined ASHRAE, I did so merely to get the reduced member rate on the HVAC Essentials training, where I met Joel Primeau who was the instructor. I did not expect my participation in the Society to go any further than that, but as my relationship with Joel progressed into one of friendship and mentorship, he coaxed me to get more involved and I decided to attend my first Toronto Chapter event. That event was a YEA social for Halloween involving escape rooms at Casa Loma and was that one event that had me hooked. It was there that I was first introduced to a fantastic group of people whom I am proud to count as friends and colleagues.

From that moment on, my participation has steadily increased. I volunteered at dinner meetings, I was invited to planning sessions, and my investment in the chapter was reciprocated. I was invited to valuable and incredibly enjoyable leadership training sessions where I learned more about ASHRAE Society and myself, board planning retreats, and regional and society conferences.

As many of you know, I did not have what most would consider a traditional engineering background and so I did not have the opportunity to work under more experienced engineers in my day to day. It was with the connections I made through #MyASHRAE that provided the surrogate mentorship that I very much needed and wanted.

In spite of the global pandemic, this past year has been one of incredibly positive change for me. I finally decided to pursue my design business full time, as well as entered the world of Academia, allowing me to share my knowledge and experience with the next generation of designers and trades people. I've also rolled on as the Historical Committee Vice Chair and have increased my involvement in technical committees by writing for the Certified HVAC Designer Study Guide, Commercial Kitchen Ventilation Design guide and will be delivering my first conference seminar at the end

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of June.

#MyASHRAE has been incredibly demanding, yet equally rewarding. Without it I do not believe I would be where I am professionally and personally, and I wish the same for many out there who could also receive the same benefit. As a Student Branch Advisor, I take the time to try to introduce a new batch of students to the ASHRAE family and hope that they get the same out of it that I did.

How about you? Tell me #YourASHRAE story! What have you gotten out of your membership with ASHRAE? What have you put into it? Who have you introduced to the society, or mentored in it? I would like to hear about how ASHRAE has benefited you, and how you have helped contribute to the chapter, region, or society. As a grassroots organization, it's up to each and every one of us to make #OurASHRAE a success!

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SUMMARY WEBINAR - 3 MAY 2021

Refrigeration 101 with Practical Examples



Mike Genin P. Eng.
ASHRAE Toronto Chapter Board of Governors and Refrigeration Chair (2020-21)

In the May 3rd webinar, **Mike Genin, P.Eng** introduced listeners to the fundamentals of vapour-compression refrigeration. Genin reviewed the four main components of the refrigeration cycle (evaporator, compressor, condenser, expansion valve), plotting a typical refrigeration cycle on a pressure-enthalpy diagram. Vapour-compression refrigeration depends upon manipulating the operating pressure of a system so that heat absorption and rejection occur at points convenient for comfort cooling. While the technology of refrigeration is well-established, engineers are still working to adapt to the green refrigerants of the future. When selecting and designing for sustainable refrigerants, it is necessary to balance competing demands: a sustainable refrigerant must have a low global warming potential (GWP) while also allowing the system to run efficiently. If the refrigerant is not selected carefully, the increased energy consumption of the system will counteract any environmental benefits gained from switching to an alternative refrigerant.

Genin emphasized that a refrigerant need not be a mysterious or obscure chemical; rather, almost any substance can be a refrigerant, including water, CO₂, ammonia, and propane. Genin also noted that refrigeration is a life-altering technology on par with the lightbulb, the internet, and farm mechanization, and that without refrigeration large cities as we know them could not exist.

Summary by Monica Brands

Gazette Committee, ASHRAE Toronto Chapter

SUMMARY WEBINAR - 17 MAY 2021

Fundamentals of Data Center Cooling



Ahmed Abdelsalam, Ph.D., P. Eng., CEM, BEMP, HBDP
Senior Mechanical Engineer and CTTC Chair, ASHRAE Toronto Chapter(2020-21)

On 05/17/2021, **Ahmed Abdelsalam** gave a presentation on Fundamentals of Data Center Cooling. Data Centers are where our data over the internet are stored and are critical for the operations of many industries such as banking, social media, etc. Although there is a lot to talk about data centers, Ahmed condensed all the information in 1 hour webinar to give us summary of cooling system of data centers. From data centers layout, ASHRAE guidelines and design to key performance indicators and ongoing R&D works to improve cooling and performance were covered.

Our demand for data has increased exponentially in the last 10 years and is projected to continue to increase in the next 10 years. This also means that the energy required for cooling is also going to increase exponentially. There are many rooms and systems within data centers, but server rack room is the most important one where our data is kept. The data center requires to be operating 24x7 and cannot afford any or much downtime. Emergency diesel generators and energy storage system are employed to distribute energy via power distribution unit and maintain 24 hours operation. Many businesses based on their need push for 5 or 6 nines (99.999% or 99.9999%) availability. Cooling systems used are usually either CRAC units and chiller + cooling tower system or CRAH with chiller + cooling tower. PUE and WUE (Power and Water Usage Effectiveness) are two key performance indicators used to assess performance of data centers. A project with high WUE may not get approval in countries under water stress. The design of data centers is different from commercial and residential buildings. For example, even a 5°C change in temperature inside an hour can lead to manufacturer warranty breach and significant loss for the owner. Hence, ASHRAE developed its own guideline 90.4 standard which was released in 2016 for data center and proved to be quite popular.

Ahmed also covered air flow management within data centers and ASHRAE TC 9.9. Other efficient designs such as immersion cooling, prefabricated modular data centers, waste heat recovery, sea-cooled data centers were also shown during the webinar. A data center in Stockholm, Sweden has implemented waste heat recovery in their design and another project implemented sea-cooled technology in Helsinki, Finland.

Summary by Eshan Patil
Gazette Committee, ASHRAE Toronto Chapter

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We want to hear from all members of the industry and are excited to share HVAC/building system news and current chapter events.

Have some thoughts on social media content? Email: [Eshan Patil](mailto:Eshan.Patil)

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