

THE LONG ISLAND SOUNDER



Long Island
Chapter

2023-2024

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PRESIDENT'S MESSAGE



Introduction

The ASHRAE LI chapter is continuing the energy and effort to continue our strong start in September. The board members and committee chairs met ahead of the dinner presentation to discuss upcoming programs, joint meetings with other industry professionals, spring field trip, sustainability forums at local universities, government outreach, research promotion milestones, membership promotion/retention, and upcoming YEA events.

Recognition

A SPECIAL THANK YOU to Mr. Farrell (Senior Project Manager, SMACNA) for presenting at the November meeting on System Air Leakage Test Standard. Mr. Sill (Direction and Regional Chair, ASHRAE) visited our chapter as well during this meeting and gave a great presentation on ASHRAE Initiatives, Policies, Decarbonization, Membership and Professional Development.

Another special **Thank you!** to Mrs. Ross (Regional Application Consultant, Belimo) for sponsoring our December 5th YEA event.

Past Events

Unfortunately, our Skeet Shooting Event was cancelled due to the inclement weather. Be on the look out for the next date! The ASHRAE LI chapter had a great turnout at the December 5th YEA Event at Great South Bay Brewery which included a tour of the facility and the refrigeration equipment and procedures involved to create the beverage enjoyed by millions around the world.

Communication

Our chapter continues to utilize and observe a positive impact utilizing online tools more effectively. Through our social media accounts, we frequent update with upcoming YEA events, joint meetings and network opportunities.

Upcoming Events

We are currently in the process of planning the next YEA Event. Stay tuned for details!

The board has approved the vote on Hosting a joint Trade Show with ASPE. A flyer will be circulated with registration costs and details for event scheduled for March 12th, 2023 at Westbury Manor.

We are planning our annual field trip tentatively slated for May 14th. Details to follow.

Volunteering Opportunity – Judges are needed for the LI Science and Engineering Fair on January 31st and March 5th at Crest Hollow Country Club in Woodbury. The flyer can be found at the end of this months Newsletter.

Member Involvement

As our organization is completely volunteer, I urge all who are interested in becoming involved in our organization to please reach out to myself or any of the board members. There are endless of opportunities network, volunteer and grow as an individual.

M.Nigro

Long Island Chapter President

Chapter Monthly Meeting - Program for 2023/2024

| | |
|---|--|
| <p>September 12, 2023* <i>At Westbury Manor</i></p> <p>Dinner Presentation – Smart Campuses: New Adaptations of Chilled Water Optimization Demand Flow Technology Strategies</p> <p>Presenter: Mark Benevides & Andrew Kozak</p> <p style="text-align: right;">**1 PDH**</p> | <p>March 13, 2024 <i>* At Westbury Manor</i></p> <p>Dinner Presentation— TBA</p> <p style="text-align: right;">**1 PDH**</p> <p>Student Activities Night YEA Night</p> |
| <p>October 10, 2023* <i>At Westbury Manor</i></p> <p>Dinner Presentations - Domestic Hot Water Heat-Pump— Challenges and Solutions</p> <p><i>Presented by: Scott Shufflebotham</i> Sales Engineer, Daikin Applied</p> <p style="text-align: right;">**1 PDH**</p> | <p>April 10, 2024</p> <p>Dinner Presentation— TBA</p> <p style="text-align: right;">**1 PDH**</p> |
| <p>November 14, 2023 <i>* At Westbury Manor</i></p> <p>Dinner Presentation— System Air Leakage Test Standard</p> <p>Presented by: William C. Farrell II Senior Project Manager for SMACNA</p> <p style="text-align: right;">**1 PDH**</p> <p>Membership Promotion Student Activities Night and YEA Night Resource Promotion Night</p> | <p>May 2024 <i>* Cherry Valley Club, Garden City, NY</i></p> <p>ANNUAL GOLF OUTING</p> |
| <p>December 12, 2023 <i>* At Westbury Manor</i></p> <p>Dinner Presentation— Future of Refrigerants</p> <p>By: Steve Kujak</p> <p>**1 PDH**</p> | <p>May 15, 2024</p> <p>Annual Field Trip—TBA</p> |
| <p>January 9, 2024 <i>* At Westbury Manor</i></p> <p>Dinner Presentation— TBA</p> <p>**1 PDH**</p> | <p>June 12th 2024 <i>* At Westbury Manor</i></p> <p>Free Buffet Dinner for Members</p> <p>PAST PRESIDENTS NIGHT & OFFICER INSTALLATION STUDENT SCHOLARSHIPS TO BE AWARDED ASHRAE History Quiz and prize Give-A-Ways</p> |
| <p>February 6-8, 2024</p> <p>AHR Expo</p> <p>Location: Chicago, IL</p> | <p>July 2024- TBD (4pm-8pm) <i>* Dixie II @ Captree State Park Boat Basin, NY</i></p> <p>ANNUAL FISHING TRIP</p> |
| <p>February 20, 2024 <i>* At Westbury Manor</i></p> <p>Dinner Presentation— TBA</p> <p style="text-align: right;">**1 PDH**</p> <p>Membership Promotion Night Resource Promotion Night</p> | <p>August 2024</p> <p>CHAPTERS' REGIONAL CONFERENCE (CRC) REGION I GRANIT STATE</p> |
| <p>February 20-26, 2024</p> <p>NATIONAL ENGINEERS WEEK</p> | |

Long Island Chapter Officers & Committees

ASHRAE 2023/2024

OFFICERS

| POSITION | NAME | EMAIL |
|--------------------|-----------------------|--|
| President | Michael Nigro | c006@ashrae.net |
| President-Elect | Elizabeth Jedrlinic | c006pe@ashrae.net |
| Vice President | Michael Razzano | c006vp@ashrae.net |
| Treasurer | Matthew Catan | c006tr@ashrae.net |
| Secretary | Zhigang XU | c006sec@ashrae.net |
| Board of Governors | Richard Smith | c006bog1@ashrae.net |
| Board of Governors | Michael S. Gerazounis | c006bog2@ashrae.net |
| Board of Governors | Thomas DiBenedetto | c006bog3@ashrae.net |
| Board of Governors | Matthew J. Vitrano | c006bog4@ashrae.net |
| Board of Governors | Murat Bayramoglu | c006bog5@ashrae.net |

ASHRAE 2023/2024

COMMITTEES

| COMMITTEE | NAME | EMAIL |
|--|---|--|
| Programs & Special Events | Michael Nigro | c006pe@ashrae.net |
| Membership (MP) | Murat Bayramoglu | c006mep@ashrae.net |
| Refrigeration | Matthew J. Vitrano | c006ref@ashrae.net |
| Chapter Technology Transfer (CTTC) | Thomas DiBenedetto | c006cttc@ashrae.net |
| Government Activities (GGAC) | Rich Smith | 006ggac@ashrae.net |
| Newsletter Editor | Alexis H. Smith | c006ne@ashrae.net |
| Research Promotion (RP) | Peter Conte | c006rp@ashrae.net |
| Historian | Thomas DiBenedetto | c006his@ashrae.net |
| Student Activities (SA) | Zhigang Xu | c006sa@ashrae.net |
| Young Engineers in ASHRAE (YEA) | Steven Gerazounis | c006yea@ashrae.net |
| Webmaster | Frank Paradiso | c006web@ashrae.net |
| Nominating | Michael Gerazounis, PE, LEED AP | nominating@ashraeli.org |
| Reception & Attendance | Zhigang Xu / Matt Catan / Michael S. Gerazuonis | reception@ashraeli.org |
| PR & Engineering Joint Council of LI (EJCLI) Liaison | Andrew Manos, LEED AP | pr@ashraeli.org |
| Golf Outing | Peter Gerazounis, PE LEED AP | golf@ashraeli.org |
| Awards | Brian Simkins | c006ha@ashrae.net |
| ASHRAE LI, P.O. Box 79, Commack, NY 11725 | | |

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Meeting Program



Dinner Presentation

The Future of Refrigerants



Presented by: Steve Kujak

Director of Next Generation Refrigerants Research for Trane Technologies

| | | | |
|---------------------------|--|-------------|--|
| DATE: | TUESDAY, DECEMBER 12TH, 2023 | | |
| Time: | 6:00 PM - Cocktails and Hors D'oeuvres 7:00 PM - Dinner Presentations 8:45 PM - Conclusion | Fee: | Members - \$50 pp Guests - \$70 pp Students - \$15 pp |
| Location: | WESTBURY MANOR (516) 333-7117 1100 Jericho Tpke., Westbury, NY 11590 Directions are posted at @ www.ashraeli.org | | |
| Presentation: | <p>The Future of Refrigerants</p> <ul style="list-style-type: none"> - Societal environmental demands driving new regulatory policies for F-gases' GWP impact - HVAC&R industry investing resources to identify compliant refrigerants amid global regulatory uncertainties - Safe F-gases contributed to improved living standards, food productivity, and reduced heat-related deaths - Transition from CFCs to HCFCs and HFCs balanced environmental demands and societal benefits - Current shift towards lower GWP unsaturated hydrofluorocarbons (HFOs) and natural refrigerants like CO2 and ammonia - Presentation update on new low-GWP alternatives, emphasizing flammability considerations for engineers and designers. <p>All attendees will receive 1 PDH.</p> | | |
| About our Speaker: | <p>Steve Kujak is the Director of Next Generation Refrigerants Research at Trane Technologies, with 30+ years of experience in developing refrigerants, lubricants, and HVACR systems. He has authored 50+ publications, holds 30+ patents, and is a distinguished ASHRAE member. Steve chairs ASHRAE Standard 34 and the REF-CPCC committee, contributing to global refrigerant standards. He is involved in AHRI, IEC, ISO, and serves on the UNEP-RTOC committee. Steve, holding a Bachelor of Science in Chemistry, resides with his wife Annette in Brownsville, Minnesota, enjoying the beauty of the drift-less region along the Mississippi River.</p> | | |

Long Island Chapter - Past Presidents

| | | | |
|------|-----------------------------|------|------------------------------------|
| 1958 | H. Campbell, Jr. PE | 1990 | Robert Rabell |
| 1959 | Clyde Alston, PE | 1991 | Gerald Berman |
| 1960 | Sidney Walzer, PE | 1992 | Donald Stahl |
| 1961 | Sidney Gayle | 1993 | Ronald Kilcarr |
| 1962 | William Kane | 1994 | Jerald Griliches |
| 1963 | Louis Bloom | 1995 | Walter Stark |
| 1964 | Milton Maxwell | 1996 | Joe Marino |
| 1965 | Will Reichenback | 1997 | Norm Maxwell, PE |
| 1966 | Joseph Minton, PE | 1998 | Alan Goerke, PE |
| 1967 | Irwin Miller | 1999 | Frank Morgigno |
| 1968 | Walter Gilroy | 2000 | Michael Gerazounis, PE, LEED AP |
| 1969 | Charles Henry | 2001 | Ray Schmitt |
| 1970 | William Wright | 2002 | Steven M. Stein, PE |
| 1971 | Louis Lenz | 2003 | Andrew Braum, PE |
| 1972 | Ronald Levine | 2004 | Claudio Darras, P.E. |
| 1973 | Henry Schulman | 2005 | Craig D. Marshall, P.E. |
| 1974 | Myron Goldberg | 2006 | John Nally |
| 1975 | John N. Haarhaus | 2007 | Peter Gerazounis, PE, LEED AP |
| 1976 | Richard K. Ennis | 2008 | Steven Friedman, PE, HFDP, LEED AP |
| 1977 | Kenneth A. Graff | 2009 | Steven Giammona, P.E., LEED AP |
| 1978 | Evans Lizardos, PE, LEED AP | 2010 | Nancy Román |
| 1979 | Albert Edelstein | 2011 | Carolyn Arote |
| 1980 | Ralph Butler | 2012 | Brian Simkins, LEED AP |
| 1981 | Robert Rose, PE | 2013 | Andrew Manos, LEED AP BD+C |
| 1982 | Timothy Murphy, PE | 2014 | Richard L. Rosner, P.E. |
| 1983 | Leon Taub, PE | 2015 | Thomas J. Fields, P.E., LEED AP |
| 1984 | Raymond Combs | 2016 | Donald Kane, P.E. |
| 1985 | Edward W. Hoffmann | 2017 | Andrew Dubel, P.E., LEED AP |
| 1986 | Jerome T. Norris, PE | 2018 | Richard Halley |
| 1987 | Abe Rubenstein, PE | 2019 | Frank Paradiso |
| 1988 | Michael O'Rourke | 2020 | James Hanna |
| 1989 | Mel Deimel | 2021 | Matthew J. Vitrano |
| | | 2022 | Murat Bayramoglu |

PAOE

What is ASHRAE PAOE?

The ASHRAE Presidential Award of Excellence (PAOE) is a society-wide point system to track and reward chapter achievements.

Each year, the Society President establishes the point-earning activities. In this way, chapters are mobilized to work toward common Society goals. Chapters enter points they earn in our online system, and earn awards at the Region and Society level for their achievements and commitment to excellence.

PAOE POINTS FOR 2022/2023

| Chapter Members | Chapter Operations | CTTC | Communi-cations | GGAC | History | Member-ship | Research Promotion | Student Activities | YEA | Chapter PAOE Totals |
|-----------------|--------------------|------|-----------------|------|---------|-------------|--------------------|--------------------|-----|---------------------|
| | | | | | | | | | | |

FROM: Farooq Mehboob SUBJECT: PRESIDENTIAL AWARD OF EXCELLENCE (PAOE)

I am writing to you on 'Securing our Future,' a subject near and dear to us for ourselves, our families, and our beloved Society ASHRAE. This is our theme for this society year. We stand today on the threshold of the new era with its challenges, climate, economic and cultural changes to name a few. Yet we have new opportunities which await us in this digital age by global collaboration using the power of our relationships, knowledge and a willingness to change. To secure our future, every one of us needs to participate passionately in a transparent ASHRAE. The bedrock on which we will build our secure future is Diversity, Equity and Inclusion. Only then will we be able to harness the power of our relationships, harvest information in the service of our members, and embrace changes by breaking down silos and overcoming resistance to change. The PAOE system was created to provide guidance to Chapter leaders in planning your chapter activities. The goal of the 2021-2022 PAOE system was to offer a roadmap for successful Chapter operation. This year's PAOE program is designed to move our Society forward as I have explained and help in securing our future.

Historian



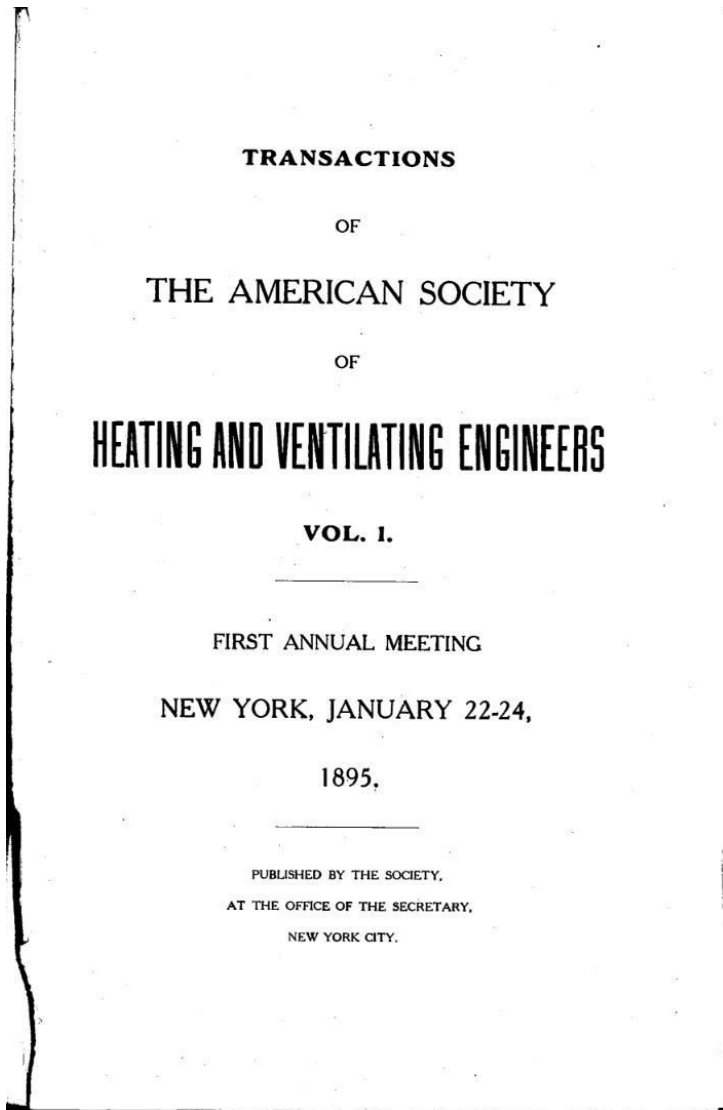
“Those who forget their history are condemned to repeat it.”

- George Santayana (Philosopher)

The American Society of Heating and Ventilating Engineers (ASHVE) held its first annual meeting in New York in January, 1895. The preface of that meeting is reproduced below. This document identifies the need for an engineering society, composed of the active workers in the field of heating ventilating work, where subjects of interest to the engineer would be discussed.

ASHVE holds an important role in the founding of ASHRAE as ASHVE, ASHAE, and ASRE merged to form a single organization in 1959.

Thomas DiBenedetto, PE
Historian



PREFACE.

The American Society of Heating and Ventilating Engineers was first talked of, at least with the idea of at once forming such society, during a visit of the present secretary of the society to the office of Hugh J. Barron, New York city, in the summer of 1894. This was just after the annual meeting of the Master Steam and Hot Water Fitters' Association, and while recognizing the great value of that association as a trade organization, it was thought that the time was ripe for a purely engineering society, composed of the active workers in the field of heating and ventilating work, at whose meetings subjects most interesting to the engineer would be discussed. As the result of this interchange of ideas the present secretary took it upon himself to ask the opinions of fifty or seventy-five engineers known to be much interested in their chosen line of work, as to the advisability of forming such an organization.

So many favorable replies were received that invitations were sent out to about twenty-five persons in New York city to come together at the office of *Heating and Ventilation*, 146 World Building, New York, Thursday, August 2, 1894. The following persons responded personally: A. A. Cary, James A. Harding, George B. Cobb, Hugh J. Barron, H. M. Swetland, W. M. Mackay, W. A. Russell, W. B. Wilkinson, Thomas Barwick, F. P. Smith, Albert A. Cryer, Edward A. Munro, Percival H. Seward, O. C. Breckenridge, and L. H. Hart. Mr. Fred. P. Smith was elected temporary chairman and L. H. Hart temporary clerk.

After discussion as to best methods of forming the society, etc., H. J. Barron moved that a committee of five on organization be selected and that a committee of three be appointed to select such a committee.

The committee on organization selected were Messrs. Fred. P. Smith, H. J. Barron, James A. Harding, W. M. Mackay, and A. A. Cary. The committee on organization were authorized to issue invitations and select the place of the next meeting. Motion was made by Mr. Cary, and carried, that those present sign a paper agreeing to form an organization of heating and ventilating engineers, and that they be made charter members. The meeting was then adjourned to September 10, at the call of the committee.

The committee on organization set actively at work correcting

a list of persons who were to be invited to become charter members, and circulars explaining the necessary qualifications were sent out with the invitations. In the meantime the committee worked hard and faithfully, formulating a constitution and by-laws for presentation at the next meeting.

The first regular meeting was called to order at 3 P. M., September 10, 1894, at the Broadway Central Hotel, New York, Mr. F. P. Smith in the chair, L. H. Hart, clerk. Mr. Smith explained the objects, advantages, and policy of the proposed organization.

Roll call found that 75 persons had become charter members. The present constitution and by-laws were adopted after some discussion and amendments to the one presented by the committee on organization. It was voted that the name of the society should be The American Society of Heating and Ventilating Engineers.

The constitution provides for an annual meeting in New York in January of each year, provision also being made for a semi-annual meeting to be held at various cities, date and place to be fixed at the annual meeting.

The following officers were elected to hold office until the first annual meeting in January, 1895: President, E. P. Bates, Syracuse, N. Y.; first vice-president, W. M. Mackay, New York; second vice-president, W. F. Wolfe, Boston, Mass.; third vice-president, Chas. S. Onderdonk, Philadelphia, Pa.; treasurer, Judson A. Goodrich, New York; secretary, L. H. Hart, 146 World Building, New York; board of managers, F. P. Smith, H. J. Barron, A. A. Cary, New York; James A. Harding, Vineyard Haven, Mass.; Henry Adams, Washington, D. C.; council on membership: Chas. W. Newton, Baltimore, Md.; R. C. Carpenter, Ithaca, N. Y.; Albert A. Cryer, New York, F. W. Foster, Boston, U. G. Scollay, Brooklyn, N. Y.

L. H. HART, Secretary.

Research Promotion



“If we knew what we’re doing it wouldn’t be called research”

– Albert Einstein

I would like to thank the companies who have participated in the annual Product Directory of Manufacturers and their Representatives. The product Directory has been prepared as a service to all its members and as a service to the local HVAC industry. It will be made available to all ASHRAE and non-ASHRAE members at no-cost and can be obtained from our monthly meetings or directly from our website.

This year’s overall research promotion goal is \$2,575,000 with many research projects on board. Our chapter is expected to raise \$29,025.00 towards the overall goal. I am hoping that I can count on the continued support of all our past contributors who have generously supported us over the years. I also look forward to gaining the support of new contributors this coming year. Last year we were successful in beating our goal and am hopeful that this year we can continuously raise the bar.

Thank you to our contributors!

Individuals

Mr. John D. Nally Mr. Matthew K. Catan

Mr. Peter J. Conte, PE

Ms. Elizabeth Jedrlinic

Mr. Andrew E. Manos

Mr. Michael Nigro

Mr. Murat Bayramoglu

Mr. Michael Steven Gerazounis

Mr. Richard W. Smith

Mr. Thomas Arthur DiBenedetto

Mr. Zhigang Xu

Mr. Albert Stark

Mr. Steven Gerazounis

Mr. Frank Paradiso

Mr. Michael H. Razzano

Contributions can be made in the following ways:

1. Mail checks, made out to ASHRAE Research Promotion to:

Peter Conte

ASHRAE Research Promotion Chair

PO BOX 79

Commack, NY 11725

2. Hand check to me at any of the chapter meetings.

3. PayPal from the ASHRAE Long Island Website

Click Donate Button

4. www.ashrae.org

Please make sure you accredit the contribution to the Long Island Chapter 006



- Pete Conte

Chairperson

YEA



Hello everyone, I am your YEA chair, Steven Gerazounis. The purpose of the YEA committee is to provide ASHRAE members 35 years old or younger with opportunities to network, educate and grow themselves through chapter events. Please check back regularly to the newsletter and on ASHRAE's website for all the news and opportunities available. I look forward to seeing as many of you as possible in the upcoming months at ASHRAE and YEA events!

Join us on December 5th at Great South Bay Brewery for a great night of comradery, learning and food & drinks! This event is sponsored by Belimo, who will be giving a demonstration of their latest products and giving away fantastic prizes. And more, our group will get an inside look at the brewery facilities and beer making process. Sign up at the link below:

<https://www.ashraeli.com/young-engineers-events.html>

A promotional poster for the ASHRAE YEA Brewery Event. The poster has a light gray background with a teal border. At the top, there is a decorative banner with teal and white checkered patterns. Below the banner, the text reads: "ASHRAE LI PRESENTS" in a small, black, sans-serif font. The main title "ASHRAE YEA BREWERY EVENT" is in a large, bold, black, sans-serif font. Below the title is an illustration of two golden beer mugs with white foam, flanked by wheat stalks. Underneath the illustration, the date "DECEMBER 5TH, 2023" is written in white on a teal banner. Below that, "FOOD - PRIZES - BEER" is written in black. Another teal banner contains "\$35 PER PERSON" in white. The venue information "GREAT SOUTH BAY BREWERY (MAIN TAPROOM) 25 DREXEL DR, BAY SHORE, NY 11706" is in black. At the bottom left, a clock icon is followed by "6-9PM". At the bottom right, it says "SPONSORED BY: BELIMO" with the Belimo logo. In the bottom left corner of the overall image, there is a small ASHRAE YEA logo.



YEA Events



YEA Leadership Weekend
1.0

LEARN MORE



YEA Leadership Weekend
2.0

LEARN MORE



YEA Leadership
International

LEARN MORE

YEA Programs



Leadership U

LEARN MORE



LeaDRS

LEARN MORE



HVAC Design Scholarship

LEARN MORE

<https://www.ashrae.org/communities/young-engineers-in-ashrae-yea/yea-events-and-programs>

Leadership U

If you wanted the opportunity to participate and follow regional and society officers there are two great options to do so! With Leadership U (4) YEA members will be selected for the winter or annual conference and attend all of their respective society officer's events, board meetings and social activities. Applications for the 2024 Winter Conference in Chicago are open until October 15th. Please use the link below to register and for more information.

<https://www.ashrae.org/communities/young-engineers-in-ashrae-yea/yea-events-and-programs/leadership-u>

LeaDRS

Similar to the Leadership U program, LeaDRS allows a region to select any ASHRAE member to shadow their Director and Regional Chair (DRC) at an ASHRAE Conference. To apply for this program you must contact the DRC directly. For Long Island that would be Steven Sill.

Region I : Mr. Steven C Sill

Email: R01drc@ashrae.net

HVAC Design Scholarship

Are you looking for the chance to get a better grasp of the fundamentals and technical aspects to design, install and maintain HVAC systems? YEA has a fantastic program to cover all of those bases with an attendance scholarship for either level I or II training. Applications for this program are now open!

<https://www.ashrae.org/communities/young-engineers-in-ashrae-yea/yea-events-and-programs/yea-scholarship-for-hvac-design-essentials-training>

Technical Committees

Are you looking to get more involved with your industry or ASHRAE as a whole? Take a look to see if there are any technical committees that interest you!

<https://ashrae.org/technical-resources/technical-committees>

Getting more involved gives you the opportunity to directly impact our industry and expand your knowledge base. To learn more about these committees you can also reach out via phone or email at:

404-636-8400

tcstaff@ashrae.net

YEA Awards

So many YEA members are deserving of awards for their hard work, dedication and faithful service to this society but don't receive them because people don't know they are eligible to be nominated. Please look into the numerous awards available for YEA members under the Honors and Awards tab.

<https://www.ashrae.org/communities/young-engineers-in-ashrae-yea/honors-and-awards>

For any awards that you cannot nominate yourself or another YEA member you may need to reach out to your YEA Regional Vice Chair, Society YEA Committee member or Director and Regional Chair to provide them with the information they require to submit a nomination form.

2023 Decarbonization Challenge

ASHRAE President Ginger Scoggins, P.E. has announced her '23-'24 Society theme, Challenge Accepted: Tackling the Climate Crisis. Her plan includes a Decarbonization Challenge Fund, a year-long competitive grant (\$1,000 - \$10,000) program to implement decarbonization projects within local chapters. This program is implemented through the YEA Committee with grassroots outreach through YEA chairs/committees at each chapter and open to all ASHRAE members and chapters. Applications will be open through November 30th, 2023.

<https://www.ashrae.org/communities/young-engineers-in-ashrae-yea/yea-decarb-initiative>

Please feel free to reach out to me with any questions or comments about YEA.

- Steven Gerazounis



Government Affairs Committee (GAC)

COP 'cooling pledge' vows 68% emissions cut by 2050

Bangkok: A "cooling pledge" to be unveiled at next month's COP28 climate summit will commit countries to slash cooling-related emissions 68 percent by 2050, according to a draft text seen by AFP on Friday. It remains unclear which countries will sign up to the pledge, and whether heavyweights such as China and India, where demand for air conditioning is growing fast, will participate.

Cooling methods currently account for over seven percent (**7%**) of global greenhouse gas emissions, according to the United Nations. They contribute to emissions because of the electricity needed to power tech such as ACs and fans, and because air conditioning and refrigeration

generally rely on hydrofluorocarbons.

These are short-lived but powerful pollutants that can have exponentially greater global warming effects than carbon dioxide.

The UN has said there are already an estimated 3.6 billion cooling appliances being used globally, but that figure is expected to soar, with global energy demand for cooling tripling by 2050. "Without policy intervention, direct and indirect emissions from air conditioning and refrigeration are projected to rise 90 per cent above 2017 levels by the year 2050," a UN report warned in 2020.

The Global Cooling Pledge commits signatories to work on "reducing cooling-related emissions across all sectors by at least 68% globally relative to 2022 levels by 2050".

It acknowledges the rising numbers of heat-related deaths globally, and that nearly three billion people currently have inefficient cooling options. But it suggests access to cooling can be expanded while reducing the sector's emissions through tools including more efficient air conditioners, buildings that use passive cooling, and a reduction in the most potent hydrofluorocarbons. "Coordinated international action on sustainable cooling" can save the emission of 78 billion tons of carbon dioxide equivalent -- a measure of greenhouse house emissions -- by 2050, the pledge said.

Global negotiators meet in Dubai from November 30 for crunch climate talks expected to focus on the future of fossil fuels, a call for ramping up renewable energy use and wrangling over financing for adaption and transition in the developing world.

Source Article. [COP 'cooling pledge' vows 68 percent emissions cut by 2050 | The Peninsula Qatar](#)

National climate resilience plan

The Biden administration released on Thursday a [plan to increase climate resilience](#) nationwide. The "National Climate Resilience Framework" identifies the federal government's six overarching climate resilience goals and provides specific actions that could be taken to accomplish them.

The plan says it centers locally tailored, community-driven solutions.

The framework "will help guide wise investment of federal dollars" and indicates that the government is moving [beyond traditional disaster response](#), said Shana Udvardy, a climate resilience analyst at the Union of Concerned Scientists, in a statement.

[National-Climate-Resilience-Framework-FINAL.pdf \(whitehouse.gov\)](#)

ASHRAE Leads the Way in Public Health Standards with Groundbreaking Resource

ASHRAE is a leader in developing guidance proven to safeguard public health. As the world grapples with a resurgence of COVID-19, along with the spread of flu and RSV, the importance of clean air flow in buildings has never been more critical. Now, the Society's pioneering resource, [ASHRAE Standard 241, Control of Infectious Aerosols](#), provides building owners, operators and professionals the ability to proactively protect indoor environments during this fall and winter virus season.

Richard Smith – GAC Chair.

Matt Catan – Co-Chair

006ggac@ashrae.net

Refrigeration



The Refrigeration Committee is back! Check out the EPA approval on new non-flammable substitutes including R-471A & R-515B refrigerants. The article can be found via accessing the below link:

<https://www.achrnews.com/articles/153632-epa-approves-new-refrigerants-for-refrigeration>

As part of its Significant New Alternatives Policy (SNAP) program, the [Environmental Protection Agency \(EPA\)](#) recently issued a determination of acceptability ([Notice 38](#)), which expands the list of acceptable refrigerant substitutes for the refrigeration market. The new substitutes include the nonflammable refrigerants, R-471A and R-515B.

EPA found R-471A (marketed under the trade name Solstice® 471A) acceptable as a substitute for use in:

- Retail food refrigeration—stand-alone equipment (new equipment only);
- Retail food refrigeration—refrigerated food processing and dispensing equipment (new equipment only);
- Retail food refrigeration—remote condensing units (new equipment only);
- Retail food refrigeration—supermarket systems (new equipment only);
- Industrial process refrigeration (new equipment only); and
- Cold storage warehouses (new equipment only).

R-471A, which is classified as an A1 refrigerant, has a GWP of about 144 and an ODP of zero. According to Honeywell, Solstice 471A is 13% more energy efficient as compared to R-404A and 30% more energy efficient compared with CO₂.

- In addition, EPA found R-515B acceptable as a substitute for use in:
- Retail food refrigeration—refrigerated food processing and dispensing equipment (new equipment only);
- Retail food refrigeration—remote condensing units (new equipment only);
- Retail food refrigeration—supermarket systems (new equipment only);
- Commercial ice machines (new equipment only); and
- Cold storage warehouses (new equipment only).

R-515B is also classified as an A1 refrigerant and has a GWP of about 287 and an ODP of zero. For remote condensing units and supermarket systems, EPA states that R-515B's GWP is comparable to or lower than that of other acceptable substitutes for new equipment, such as R-450A (GWP of 601), R-513A (GWP of 630), R-407A (GWP of 2,110), and R-421A (GWP of 2,630).

For additional information on SNAP, visit the SNAP portion of EPA's Ozone Layer Protection website at: www.epa.gov/snap.

Michael H. Razzano
Refrigeration Chair

Kenny Balci
Refrigeration Co-Chair

MEMBERSHIP PROMOTION



The role of the Membership Promotion Committee is to maintain the chapter’s membership growth each year and upgrade membership promotions. Our committee members understand that the membership is the core of our organization and put their volunteer efforts into growing the membership. At the beginning of this season, the Long Island chapter had 272 active members, excluding student members. As of Dec 5, we have 273 active members. This year, we want to reach 280. We only need to add seven more new members by the end of June 2024. We can easily surpass this goal with the contribution of our volunteers. We will promote activities to increase our membership, such as YEA and student activities, panels in Decarb/sustainability topics, and monthly technical presentations. We are planning a showcase at Westbury Manor jointly with ASPE in the spring, a golf outing in May, and a fishing

boat trip in June. Anyone who is interested in becoming an ASHRAE member can find me or one of our committee members, Liz, Albert, Steve, or Matt. Follow our activities through this newsletter and LinkedIn.

| Start Total | Goal | Net Growth Goal | Net Growth Goal % |
|-------------|------|-----------------|-------------------|
| 272 | 280 | 8 | 2% |

Here’s the good news. New members can sign up for either Winter or Summer conference for free. I encourage our new members to contact me if they want to sign up for a conference. Students only pay \$25 per year. The Smart Start program is still active. So many different options are available at ashrae.org. Below is the summary of membership benefits.

We have 22 new members since the beginning of this season. However, 22 new members only increased our gross membership by just about 1. This means that, during this period, we lost 21 members. We must increase the number of new members to maintain net positive growth because people are moving, changing jobs, or canceling their membership due to personal reasons. If any of our current active members have friends interested in joining ASHRAE, please invite them to our monthly meetings. If any of our active members bring a new member, both of their dinner is on us.

Lastly, I want to welcome our new members. I encourage them to attend monthly meetings to engage with Long Island’s industry professionals and learn from 1 PDH credited presentations. Our meetings at this great venue, Westbury Manor, allow guests to socially engage with free drinks during happy hour. Hope to see you all there.



Adrian Jhansci Diaz Gomez
Glen P. Bornhoft
Anthony Ottaviano
Joseph William Burke
Denny Vayalickollattu Johney
Peter Sgouros
Ethan Peck
Troy Peter Deal
Matthew Steven Burke
Thomas Kenny
Matthew R. Gropper
Zachary Chirinkin
Lance Montalbano Jr.
Kavya Srinidhi Cherolu
Christopher G. Cawley
Ryan Burwell
Laura Heckman
Thomas Naggy
Murat Ertas
Ralph Byers
Christopher R. Mangels
Dimitri Grammatikopolous

Again, I want to welcome our new members and personally invite them to our meetings. I encourage our new members to join our committees to volunteer in activities. Volunteering is a great path for especially young engineers in steering their careers as they collaborate with various industry professionals.

Have a great holiday season.

Membership Promotion Chair
Murat Bayramoglu

Sustainability Committee



The sustainability committee of the ASHRAE Long Island Chapter is looking forward to promoting insightful and educational events, meetings and seminars with the broad goal of promoting members to share their engineering knowledge and improve the world around them.

In the US, building emissions are estimated to contribute 777.53 million metric tons of CO₂ equivalent, escalating the rate of climate change on our planet^[1]. In order to mitigate this footprint, legislation has been passed at both the local level^{[2][3]} and at a federal level^[4] to incentivize green energy initiatives and discourage local building emissions.

Building decarbonization is an extremely popular topic in 2023, and I believe nearly all my fellow ASHRAE colleagues have been, and will continue to be affected professionally by this relatively new page in HVACR...

Albert Stark
ASHRAE LI Sustainability Chair

[1]. <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions#commercial-and-residential>

[2]. <https://www1.nyc.gov/site/sustainablebuildings/ll97/local-law-97.page>

[3]. https://www1.nyc.gov/assets/buildings/local_laws/ll154of2021.pdf

[4]. <https://www.congress.gov/bill/117th-congress/house-bill/5376>

Student Activities



The deadline to submit entries for the 2024 ASHRAE HVAC&R Student Paper Competition has been extended to December 18th, 2023. Finalists will present virtually (online) January 8th 2024.

Here's an opportunity to have your research recognized and compete against fellow ASHRAE Student Members.

Papers are being accepted on the following topics:

- HVAC&R technology
- Building services
- Indoor environmental control
- Energy performance of buildings

This competition is open to students and graduates who have completed their bachelor's or master's thesis in 2023. The paper must be based on an accepted thesis. Submissions based on doctoral thesis are not eligible.

The first-place winner will represent ASHRAE at the 2024 World Student Competition, held in Pyeong Chang, Korea during the SAREK Summer Annual Conference, June 19-21, 2024. Travel expenses, hotel and conference registration will be paid by ASHRAE to attend the World competition.

Upcoming Timeline:

December 18th, 2023 – Entrants submit a six-page maximum length paper that is based on an accepted BS or MS thesis. The finalists will be selected, advised, and invited to the next stage.

January 4th, 2024 – Posters are due. The content of the A1-size poster may be used as the basis of a visual presentation to accompany the oral presentation.

January 8th, 2024 – The finalists give a 10-minute virtual presentation.

January 21st, 2024 – Winning papers are announced and presented during the Student Program.

More information about the competition and requirements are available at:

<https://www.ashrae.org/communities/student-zone/competitions/hvac-r-student-paper-competition>

Of course, there are even much more. Explore ASHRAE Student Zone:



<https://www.ashrae.org/communities/student-zone>

Please reach out for more information if you are interested in participating any of the above programs. If you have any suggestions or would like to assist in anyway with student activities, please let me know. I look forward to seeing a lot of young faces for ASHRAE Long Island!

Zhigang Xu

Student Activities Chair


Diversity & Inclusion



Diversity & Inclusion Chairman

Overview

Happy Holidays and wishing the entire community a safe and joyful Holiday Season filled

with no work and lots of PTO! 

ASHRAE is committed to providing a welcoming environment. Our culture is one of inclusiveness, acknowledging the inherent value and dignity of everyone. We proactively pursue and celebrate diverse and inclusive communities understanding that doing so fuels better, more creative, and more thoughtful ideas, solutions and strategies for the Society and the communities our Society serves. We respect and welcome all people

regardless of age, gender, ethnicity, physical appearance, thought styles, religion, nationality, socioeconomic status, belief systems, sexual orientation or education.

ASHRAE Training Recordings: DEI Foundations & Implicit Bias in Decision-Making

Video Topics include Microaggressions, Equality vs Equity, Cultural Competency, Understanding Implicit Bias in Decision-Making, DEI Foundations

Video Link: <https://presentationaccess.ashrae.org/Index?identity=memberchair>

DEI Suggested Readings:

Blind Spot: Hidden Biases of Good People – Mahzarin R.R. Banaji and Anthony Greenwald

- Thinking Fast Slow - Daniel Kahneman
- The 4 Stages of Psychological Safety: Defining the Path to Inclusion and Innovation – Timothy R. Clark
- The Sum of Us: What Racism Costs Everyone and How We Can Prosper Together - Heather McGhee
- So You Want to Talk About Race – Ijeoma Oluo
- Inclusive Conversations – Mary-Frances Winters
- The 5 Disciplines of Inclusive Leaders – Andres T. Tapia & Alina Polonskaia
- How to Manage Conflicts: 7 Easy Steps to Master Conflict Management, Conflict Resolution, Mediation & Difficult Conversations – Amy Gallo
- Radical Candor – Kim Scott
- Biased: Uncovering the Hidden Prejudice That Shapes What We See, Think and Do – Jennifer Eberhardt
- What Works: Gender Equality by Design – Iris Bohnet
- Disability Visibility: First Person Stories from the 21st Century – Alice Wong
- Men Explain Things to Me – Rebecca Solnit

Members of the ASHRAE Board of Directors Diversity, Equity and Inclusion Subcommittee:

- Kishor Khankari, *Chair*
- Cheng Wee Leong
- Devin Abellon, *Consultant*
- Susanna Hanson, *Vice Chair*
- Heather Schopplein
- Dunstan Macauley III, *Consultant*
- Mahroo Eftekhari
- Jonathan Smith
- Tanisha Meyers-Lisle, *Staff Liaison*

How “Master” and “Slave” Terminology is Being Reexamined in Electrical Engineering

- by [Tyler Charboneau](#) (October 06, 2023)

“Master” and “slave” have been used for decades in engineering vernacular. Now, many tech companies are pushing for more neutral terms.

The terms “master” and “slave” have drawn varying degrees of debate in engineering circles. And, in light of shifting norms and perceived racial connotations associated with the terms, many professionals are questioning their engineering necessity.

Accordingly, those in support of changing master-slave terminology argue that the terms' acceptance in the field speaks to the shortage of [Black representation in the field](#). Only 3.53% of electrical engineering degrees were awarded to Black students in 2017.

What are the origins of this terminology in electrical engineering? And what are the stances in preserving or replacing these terms on an industry-wide scale?

The Meaning of Master and Slave in Electrical Engineering

[“Master” and “slave” have been used for decades](#) to describe the relationships between various components, process controls, and resource branches. “Master” may mean first, whereas “slave” accordingly is considered second.



“Master” and “slave” used on a circuit board. Image used courtesy of [VICE](#)

These terms also have their places on the device side. Within a hardware ecosystem, a "master" device may serve as the hub while "slave" devices behave accordingly to its directives.

Some practical examples:

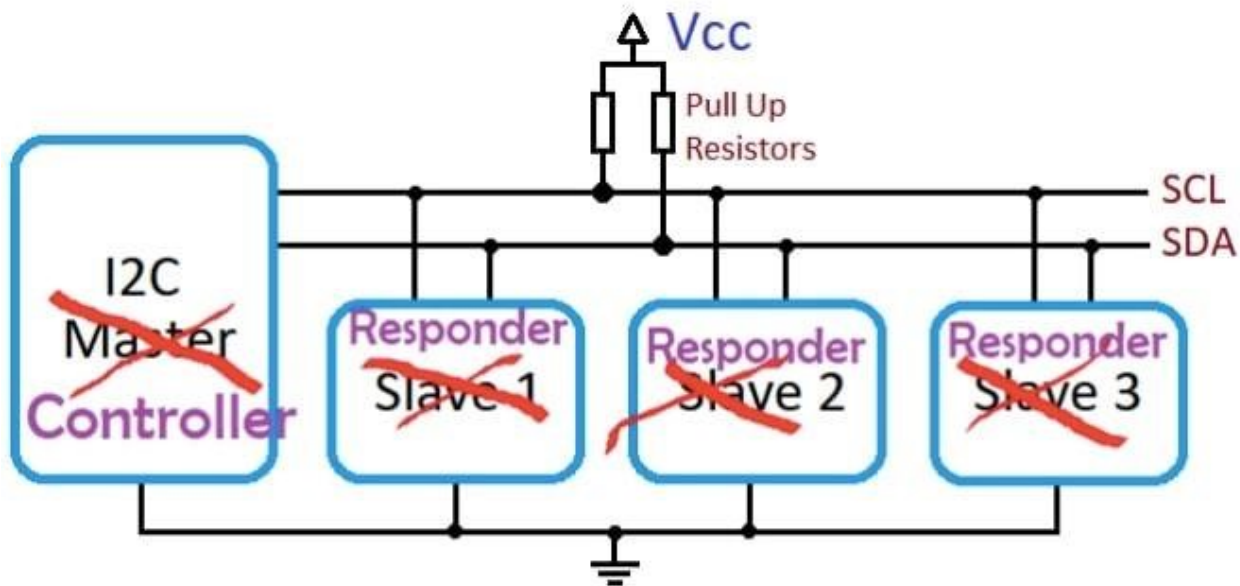
- ATA hard drive groupings, where the "master drive" has communicative priority
- "Master clocks" send timing signals to multiple "slave clocks" for synchronization

Both terms have traditionally described the hierarchical link between components and other technological elements.

A Long-Held Discussion on Nomenclature Comes to a Head

2020 isn't the first time that the nomenclature has been a talking point. In fact, as far back as 2003, [Los Angeles officials suggested that manufacturers, suppliers, and contractors explore alternatives to master-slave terminology.](#)

"Master" and "slave," despite their seemingly-innocuous meaning in computing, have inspired criticism for their perceived racial undertones. While minority professionals have led the charge to change the terminology, their requests haven't been homogenous; white professionals and allies of the racial-equality movement have voiced their concerns as well.



Recently, *EE Times* contributor Leonard Ellis exhorted IEEE to retire the terms "master" and "slave," proposing "controller" and "responder" as an alternative. Image used courtesy of [EE Times](#)

That's not to say that these terminology changes are universally praised. When an entire industry operates one way for a long time, those routines become entrenched and can be tangibly difficult to shift

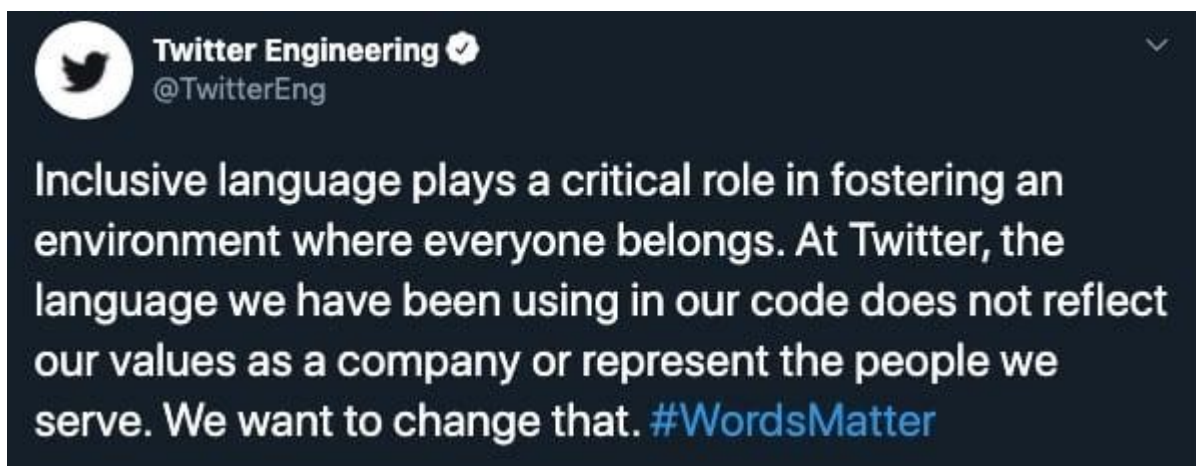
at a programming level. In Los Angeles' case, vendors and manufacturers decried the proposal because it would require cumbersome relabeling and identification.

Though the move was merely a suggestion, switching to new terminology does incur scaled costs—especially when a company must invest in their employees' efforts to make system-wide changes in terminology.

Tech Companies Changing the Terminology

Companies purporting themselves as culturally sensitive have pledged to consider employee complaints. At Twitter, a [pair of engineers kickstarted the effort to change such terminology internally following months of lobbying](#)—an effort that increasingly gained support at Twitter headquarters in tandem with the Black Lives Matter movement.

Here's what Twitter Engineering had to say:



Twitter Engineering's statement on inclusive language. Image courtesy of [Twitter Engineering](#)

The change was part of a greater campaign—its roots traced back to January—to replace many dubious terms throughout Twitter's coding and documentation. The entire open-source community encompassing Twitter has faced these same challenges head-on.

Perhaps no company is more synonymous with open source than GitHub—a preeminent development platform with over 40 million active users. The company has recently announced that it is converting any references to “master” with “main.” This is occurring within GitHub's own repositories and documentation.

Immediate enforcement could impart plenty of instability upon existing repositories and projects. However, GitHub has promised a phased rollout. Individual developers are also encouraged to rename their own branches accordingly. GitHub is an indispensable tool for numerous tech companies. Consider that over 25,000 of Microsoft's developers harness GitHub—underscoring the impact of one site's policy changes.

Additionally, Android, Go, the PHPUnit library, Curl have promised to take similar steps with related terminology. OpenZFS' own adjustments have also emulated Twitter's. Django and Drupal have also introduced alternatives to these terms.

A Question of Association

Some skeptics of the proposed master-slave terminology shift have acknowledged the inherently negative link between "slave" and "master" when used in tandem. However, many have expressed that while the former must be stricken from the EE vernacular, the latter term isn't offensive in itself.

Python axed the terms "master" and "slave" from its programming language back in 2018, sparking the discussion of whether "master" can still be used so long as it is not in association with a "slave" counterpart. No need to alter both terms if the effort puts an undue burden on manufacturers and programmers, explained those opposed to the change.

Renaming the default branch from `master`

Many communities, both on GitHub and in the wider Git community, are considering renaming the default branch name of their repository from `master`. GitHub is gradually renaming the default branch of our own repositories from `master` to `main`. We're committed to making the renaming process as seamless as possible for project maintainers and all of their contributors. This repository is our up-to-date guidance on how and when to rename your default branch.

GitHub's announcement to change "master" to "main." Image used courtesy of GitHub

As mentioned previously, GitHub made the shift from "master" to "main," even though a "slave" counterpart doesn't exist in GitHub's references.

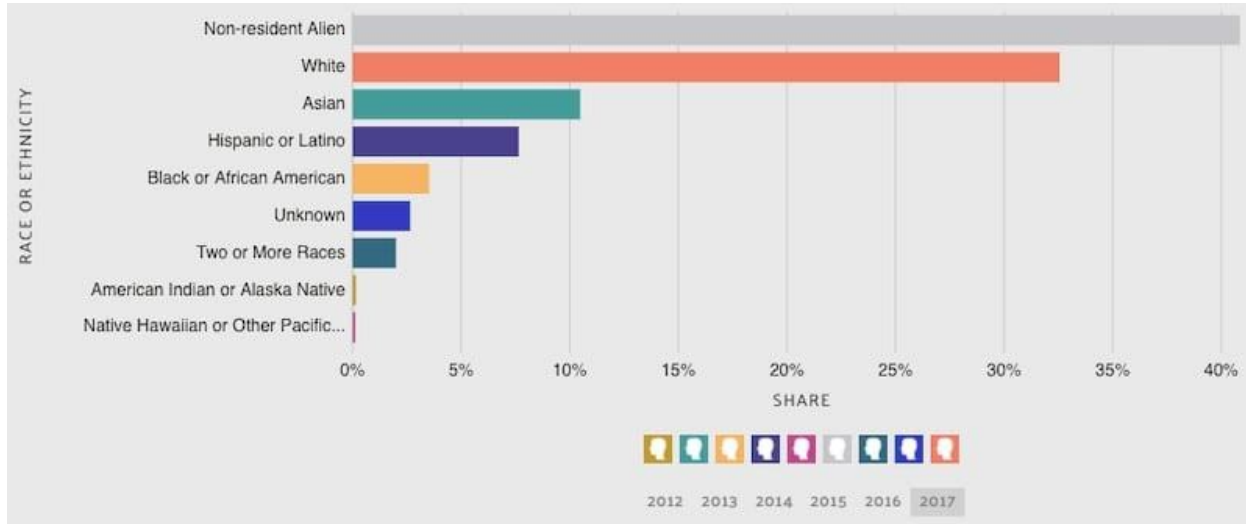
Alternatives to Master-Slave Terminology

Several companies have introduced their own approaches when nixing "master" and "slave." Here are some proposed and instituted alternatives:

- Primary and secondary
- Primary and replica
- Primary and standby
- Leader and follower
- Conductor and follower
- Source and sink
- Main

A Change in Terminology May Require Steep Adjustments

For various reasons, the move to render “master” and “slave” technically obsolete has had its supporters and detractors. Supporters remark that Black engineers (and hopefuls) have already had to carve successful paths in a field that doesn’t represent them adequately. A change in this terminology would encourage more inclusivity in the field, they explain.



Race and ethnicity in electrical engineering by degrees awarded. Image used courtesy of Data USA: Electrical Engineering

Detractors claim that the change is too expensive, time-consuming, or impactful upon existing systems. These individuals feel the adjustment period to new terminology would be too steep, should this change become ubiquitous, and the process of changing the terms may seem tedious at the onset.

Some vendors worry that companies may reject their products if changes don’t occur within certain time periods.

Long Island Science & Engineering Fair, Inc.

998 Old Country RD STE C PMB 164
Plainview, New York 11803 www.lisef.org

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Dear Colleague,

LISEF is going live again!

The Long Island Science and Engineering Fair (LISEF) is among the largest regional high school fairs in the country. At this yearly forum outstanding students submit and exhibit their research. Based on judges scores, finalists are selected from over 500 student participants to compete at the annual International Science and Engineering Fair (ISEF).

This year, LISEF 2024 will be a two-round in-person event. Round 1 (Wednesday, January 31st) and Round 2 (Tuesday, March 5th) will be held at the Crest Hollow Country Club in Woodbury, NY. We will be following all local, NYS DOH, and CDC Covid-19 guidelines. Changes to the events may be made, if needed, to meet health and safety requirements.

Inevitably, we find ourselves **in need of qualified judges** each year to help evaluate student projects in 22 disciplines. Judges are typically asked to interview, evaluate, and score between 8- 12 projects, depending on the category. We are asking all qualified individuals (medical/veterinary doctors, university faculty, post-doctoral associates, graduate students, engineers with field experience) to consider judging at **either** or **both** Rounds of our fair. Judges are asked to sign-in by 8 AM both days and can expect to leave by 3:00 PM on January 31st and 1:30 PM on March 5th. All judges are provided a continental breakfast and a buffet lunch.

This year judges' registration will remain open through January 30th and reopen February 1st. Project abstracts will be available for review January 25th.

A recommended scoring rubric will be available to use as a guide for judges. Winners will be selected by converting the judges raw scores from both rounds into Z-scores.

The LISEF judging categories are listed at the end of this letter.

If you judged for us last year, your information has been archived, you can login using your username and password from last year or view our [How To Restore Judges Information](#)". Edit all information as needed if there have been any changes in the past year.

If you are joining us as a judge for the first time, there are **three key steps** to the registration process:

Step 1. You will need to **create a user account** on the LISEF website (and only then can you complete the registration process) To “Create User Account” please view our [How To Guide to Create a New Judges Account.](#)”

- a. In the top right corner of the LISEF website (www.lisef.org), select “REGISTER”
- b. First and Last Name, email address, phone number and a password are required to create an account.
- c. Once an account is created it can be used every year moving forward.

Step 2. Verify Email (An email will be sent to you to verify the account.)

Step 3. Register as a LISEF Judge

- a. Once your account is verified, you can proceed via the emailed link, or click on “LOGIN” on the top right of the LISEF website.
- b. Select LISEF Judge and proceed from there.

Judges will be asked to provide the following information:

Academic Discipline; Degree; Current or Former Institutional Affiliation or Place of Employment; Indicate up to 3 category judging preferences; years judging at LISEF; recommendations for additional LISEF judges if any and their lunch choice.

Please note – Once judges have completed their registration they are then logged into their dashboard. From the dashboard judges can also edit parts of their registration, view the ISEF category descriptions, view project abstracts after January 24th.

Thank you in advance for registering as a judge or taking a moment to share this email with your colleagues as we are always in need of additional judges. We have personally found our involvement with LISEF to be a rewarding experience. We hope you will as well!

Sincerely,

Dr. Joyce Hilgeman
Trustee & Judges Co-Chair

Dr. Michael Lake
Trustee & Judges Co-Chair

ANIMAL SCIENCES (ANIM) Animal Behavior/ Cellular Studies/ Development/ Ecology/ Genetics/ Nutrition and Growth/ Physiology/ Systematics and Evolution/ Other

BEHAVIORAL AND SOCIAL SCIENCES (BEHA) Behavioral Neuroscience/ Developmental/ Cognitive Psychology/ Sociology and Anthropology/ Other

BIOCHEMISTRY (BCHM) Analytical Biochemistry/ General Biochemistry/ Medical Biochemistry/ Structural Biochemistry/ Other **BIOMEDICAL AND HEALTH SCIENCES (BMED)** Cell, Organ, and Systems/ Physiology/ Genetics and Molecular Biology of Disease/ Immunology/ Nutrition and Natural Products/ Pathophysiology/ Other

BIOMEDICAL ENGINEERING (ENBM) Biomaterials and Regenerative Medicine/ Biomechanics/ Biomedical Devices/ Biomedical Imaging/ Cell and Tissue Engineering/ Synthetic Biology/ Other

CELLULAR AND MOLECULAR BIOLOGY (CELL) Cell Physiology/ Cellular Immunology/ Genetics/ Molecular Biology/ Neurobiology/ Other

CHEMISTRY (CHEM) Analytical Chemistry/ Computational Chemistry/ Environmental Chemistry/ Inorganic Chemistry/ Materials Chemistry/ Organic Chemistry/ Physical Chemistry/ Other

COMPUTATIONAL BIOLOGY AND BIOINFORMATICS (CBIO) Computational Biomodeling/ Computational Epidemiology/ Computational Evolutionary Biology/ Computational Neuroscience/ Computational Pharmacology/ Genomics/ Other **EARTH AND ENVIRONMENTAL SCIENCES (EAEV)** Atmospheric Science/ Climate Science/ Environmental Effects on Ecosystems/ Geosciences/ Water Science/ Other

EMBEDDED SYSTEMS (EBED) Circuits/ Internet of Things/ Microcontrollers/ Networking and Data Communications/ Optics/ Sensors/ Signal Processing/ Other

ENERGY: SUSTAINABLE MATERIALS & DESIGN (EGSD) Biological Process and Design/ Energy Storage/ Hydrogen Generation and Storage/ Other Thermal Power/ Solar Process, Materials, and Design/ Thermal Generation and Design/ Triboelectricity and Electrolysis/ Wind/ Wind and Water Movement Power Generation/ Other

ENGINEERING TECHNOLOGY: STATISTICS AND DYNAMICS (ETSD) Aerospace and Aeronautical Engineering/ Civil Engineering/ Computational Mechanics/ Control Theory/ Ground Vehicle Systems/ Industrial Engineering-Processing/ Mechanical Engineering/ Naval Systems/ Other

ENVIRONMENTAL ENGINEERING (ENEV) Bioremediation/ Land Reclamation/ Pollution Control/ Recycling and Waste Management/ Water Resources Management/ Other

MATERIALS SCIENCE (MATS) Biomaterials/ Ceramic and Glasses/ Composite Materials/ Computation and Theory/ Electronic, Optical and Magnetic Materials/ Nanomaterials/ Polymers/ Other

MATHEMATICS (MATH) Analysis/ Combinatorics, Graph Theory, and Game Theory/ Geometry and Topology/ Number Theory/ Probability and Statistics/ Other

MICROBIOLOGY (MCRO) Antimicrobials and Antibiotics/ Applied Microbiology/ Bacteriology/ Environmental Microbiology/ Microbial Genetics/ Virology/ Other

PHYSICS AND ASTRONOMY (PHYS) Astronomy and Cosmology/ Atomic, Molecular, and Optical Physics/ Biological Physics/ Condensed Matter and Materials/ Mechanics/ Nuclear and Particle Physics/ Theoretical, Computational and Quantum Physics/ Other **PLANT SCIENCES (PLNT)** Agriculture and Agronomy/ Ecology/ Genetics/Breeding/ Growth and Development/ Pathology/ Plant Physiology/ Systematics and Evolution/ Other

ROBOTICS AND INTELLIGENT MACHINES (ROBO) Biomechanics/ Cognitive Systems/ Control Theory/ Machine Learning/ Robot Kinematics/ Other

SYSTEMS SOFTWARE (SOFT) Algorithms/ Cybersecurity/ Databases/ Human-Machine Interface/ Languages and Operating Systems/ Mobile Apps/ Online Learning/ Other

TECHNOLOGY ENHANCES THE ARTS (TECA) Display Technology/ Human Information Exchange/ Music and Image Manipulation/ Games/ 3D Modeling/ Engineering Effects/ Other

TRANSLATIONAL MEDICAL SCIENCES (TMED) Disease Detection and Diagnosis/ Disease Prevention/ Disease Treatment and Therapies/ Drug Identification and Testing/ Pre-Clinical Studies/ Other

ASHRAE CERTIFICATIONS

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- Are developed by industry practitioners who understand the knowledge and experience that are expected for superior building design and system operation
- Assure employers and clients of subject mastery
- Serve as a springboard for continued professional development
- Offer an easy-to-apply process

FOR MORE INFORMATION GO TO - <https://www.ashrae.org/education--certification/certification>

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Most Popular Tweets

Does It Cost More To Build Green? Benefits include reduced operating costs & construction waste.

Online Thermal Comfort Compliance Tool Included In New ASHRAE User's Manual.

87% of households in the US have #AC, 5% do in India. India's tough choice on air-conditioning and climate.



The November issue of the Journal is tested for binding strength to see how many times a page can be turned before the binding would fail.

Harvard & SUNY Upstate Medical University find that workers are healthier and happier in certified green buildings.

ASHRAE Standard 90.1 has been redefining energy savings since 1975. A new version is available now.

Adapting historical buildings for sustainable reuse.

Get To Know ASHRAE







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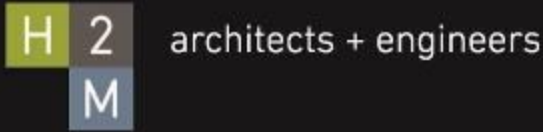


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