



Your THD Leadership Team

We all thank you for joining THD and look forward to working with you to advance our field. Please do not hesitate to reach out to anyone on the leadership team with suggestions or if you'd like to get involved.

Officers

Chair

Bao-Wen Yang
bwy01@deltaenergygroup.com

Vice Chair/Chair-Elect

Annalisa Manera
maneraa@ethz.ch

Secretary

Igor Bolotnov
igor_bolotnov@ncsu.edu

Treasurer

Steve Bajorek
Stephen.Bajorek@nrc.gov

Immediate Past Chair

Elia Merzari
ebm5351@psu.edu

Executive Committee

Terms Expiring June 2023

Yang Liu
John Luxat
Hisashi Ninokata
Piyush Sabharwal
Caleb Brooks

Terms Expiring June 2024

Xiaodong Sun
Dillon Shaver
W. David Pointer
Hyoung Cho
Musa Moussaoui

Terms Expiring June 2025

Yassin Hassan
Maria Avramova
Jun Liao
Bob Martin
Marilyn Delgado

Standing Committees

Technical Program Chair

Dillon Shaver

Honors & Awards Chair

Xiaodong Sun

Nomination Chair

Elia Merzari

Webmaster

Trevor Kent Howard

Membership Chair

Matthew D. Zimmer

Screening Committee Chair

Fan-Bill Cheung

YMG Liaison

Mathew D. Zimmer

A Message from the Chair

Dear Colleagues and Friends,

It is my greatest honor and privilege to be serving as the chair of the Thermal Hydraulics Division for the 2022-2023 term. The COVID-19 pandemic has been the most unprecedented difficulty to overcome in the last few years; as such, it is with deep appreciation that I extend my gratitude towards this community for conquering this pandemic by coming together to achieve great things despite these hardships.

At the same time, the COVID-19 pandemic has also revealed several shortcomings in our membership capabilities. As shown in the attached figure, prior to the pandemic, we noticed a downtrend in membership starting in 2017 (dropping by 9.6% from 2016), followed by a sudden drop in 2019 (23.6%). While membership has been consistent since the beginning of COVID-19, the pandemic restrictions and other factors have also made membership improvement more arduous. As we begin our return to normalcy, the Thermal Hydraulics Division has again proven itself to be great in influence per capita as reflected in the number of technical papers submitted for the ANS Winter Meeting. It is this ongoing interest in and evident relevance of thermal hydraulics that indicates more efforts are required for stimulating and capturing new memberships, including student, young professional, international, and industrial memberships. With that in mind, we have launched efforts for this venture by creating designated liaisons in the Executive Committee for each mentioned sector. In addition to the existing Student and Young Professional Liaisons, we are adding International and Industrial Liaisons to extend our outreach and bring about growth that is urgently needed for the survival, progress, and advancement of our society.

As greenhouse gas emissions become more alarming to our environment, nuclear power becomes more significant in paving a path towards a carbon neutral society. With the safety and efficiency of nuclear power relying heavily on the understanding and advancement of reactor thermal-hydraulics, it



is important for us to utilize the liaison program to further enhance the joint efforts between our industrial and academic sectors, both domestically and internationally, as I believe that a collaborative effort will greatly advance our progress towards carbon neutrality. To accomplish this goal, such synergy could deliver considerable advancements to current technology, such as the small modular reactor (SMR), which has

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Message from the Chair, cont.

become more predominant with its added benefits of increased safety, reduced footprint, and enhancement in the dynamics, flexibility, and multiplier effect from its module structure. As the industrial sector leads the development and implementation of SMR, it is important to join our efforts to bolster our advancements. Considering the rising challenges and continued development of ANS THD, I am working with former chair Dr. Elia Merzari, vice chair Dr. Annalisa Manera, and other officers to review/revise long- and short-term strategic and success plans.

As we come out of the virtual culture, I would like to take this opportunity to thank the organizers of NURETH-19 and NUTHOS-13 for their hard work and adaptive efforts in running such successful virtual conferences and keeping our meetings alive. The success of NURETH-19 continues to warrant NURETH's appearance in special issues of three reputable journals: NED, NSE, and NT. We also celebrate the success of NUTHOS-13, which took place from September 5th-10th, 2022. My personal gratitude is owed to Prof. Min Lee and Prof. Chin Pan for their diligent work in bringing such a successful conference with papers from 19 countries and 228 participants despite the uncontrollable quarantine and visa restrictions as well as the need to quickly transform the conference virtually. There were 29 technical sessions plus one special panel session held on SMR and Micro Reactors chaired by Prof. Per Peterson.

The good news is that the upcoming ANS Winter Meeting will be in-person and taking place this November 13th-17th, in Phoenix, Arizona. NURETH-20 will also be in-person and will take place in Washington D.C. from August 20th-25th, 2023. Additionally, in celebrating NURETH's 20th success, ANS THD is organizing a special dedicated technical session to recognize Prof. Neil Todreas' achievements and his impactful contributions. I would also like to thank the THD Honors and Awards Committee for their hard work and dedication in reviewing and making the decision for this year's Thermal Hydraulics Technical Achievement Award and the 2023 Sehgal Memorial Award.

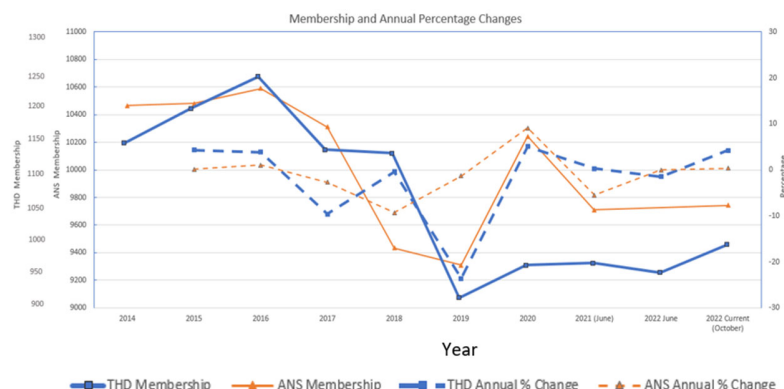
I wish to take this moment to commemorate the legacies of two distinguished individuals who have contributed immensely to our field and have recently passed away: Dr. Hans K. Fauske on September 27, 2021 at 85, and Dr. Peter Griffith on March 5, 2022 at 94. I had the privilege of meeting both esteemed pioneers for the first time in 1990 when they visited Columbia University's Heat Transfer Research Facility (CU-HTRF) together with Dr. L. S. Tong for a joint DOE-DOD project. My learning and career journey in thermal hydraulics has been greatly influenced by each legendary individual.

One thing we have certainly learned throughout the pandemic is that there are many ways for us to keep in touch. We have continued our leadership meetings monthly, which is proving to be great for communication and excellent for future planning. Another excellent outreach approach that started last year is the THD webinar. Thanks to all the volunteers, speakers, and audiences for contributing to this rather successful start-up. I am pleased to report that we are in the process of establishing a Webinar Committee devoted to organizing and continuing efforts to promote the webinar, which would continue to serve as a critical mechanism to overcome remaining pandemic impacts, geo-political tensions, and provide outreach to current and potential members. I would like to thank Marilyn Delgado who agreed to serve as the first chair of this new committee during the first organizer meeting on June 14, 2022, and for taking on the responsibility of organizing, planning, and executing the annual webinar plan for the year 2022-2023. We look forward to the proactive and continued efforts from Marilyn and the Webinar Committee in elaborating our webinar efforts; future topics may include advanced CFD, thermal stripping, integrated energy systems, and applications of artificial intelligence in nuclear systems.

On behalf of the Division and committee members, I thank you all for your continued involvement and dedication towards the Thermal Hydraulics Division.

I wish you all productivity and hope to see you all at the 2022 ANS Winter Meeting in Phoenix, Arizona and the NURETH-20 in Washington DC., 2023.

Bao-Wen Yang
ANS THD Chair 2022-2023

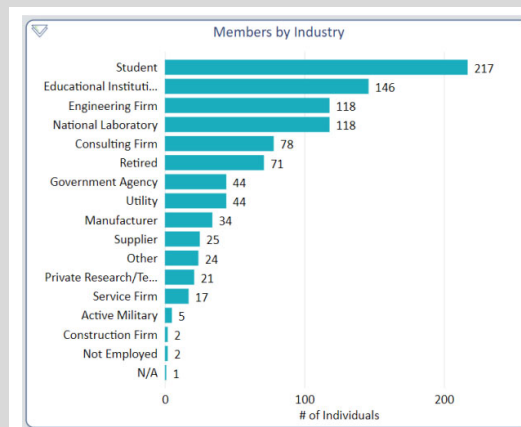


Membership Committee Report

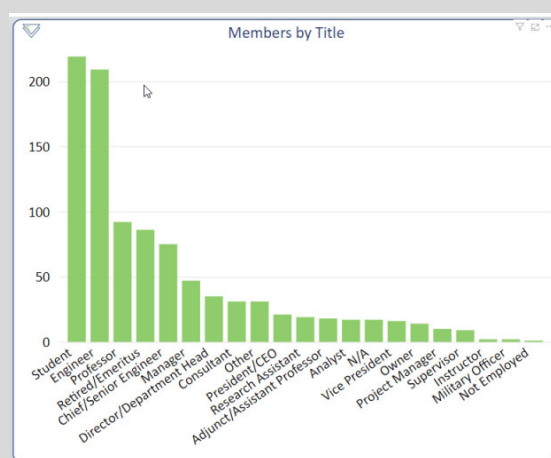
THD membership currently resides as just under 1000. This number has plateaued in recent years. Maintaining growth is key to the continued success of the division. Of the total members, large percentages come from less than 40 year olds, ~40%, and students, ~20%. Above 40, with the exception of 60-69 year olds, the representation is about constant for each age group, suggesting 40 a critical number for being a life time active member. Encouraging these young up-and-coming members is a priority of the division, and this is reflected in some of the recent activities THD has hosted. ALL THD members are encouraged to attend division meetings at conferences and engage with the committee members regarding any ideas/suggestions they have for the division. Active members are also encouraged to support and engage with young members expressing interest in the division

THD Members – Top Ten Countries with Counts

Country	# of Individuals
United States	852
Korea (Republic of)	20
Canada	15
Japan	15
Italy	12
Germany	8
United Kingdom	8
France	6
Sweden	6
Belgium	5
China	5
Total	952



THD Members by Industry



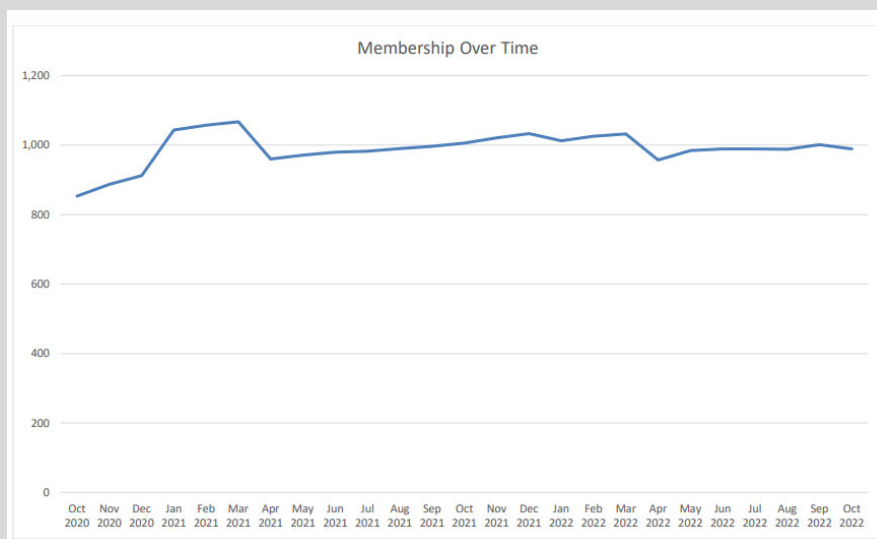
THD Members by Job Function



THD Members by Age

Continued on p. 4

Membership Committee Report cont.



Membership over Time

Technical Program Committee Report

The THD program committee is pleased to welcome everyone to Phoenix, AZ for the 2022 Winter Meeting. The meeting will include a total of 68 presentations in 19 technical sessions, including: 13 THD sessions and two cosponsored sessions with RPD. Also included are three THD panel sessions and a cosponsored panel with RPD, rounding out the technical program. All technical sessions (including panels) sponsored or cosponsored by THD are listed in the table on the right.

A total of 64 summaries were submitted to THD with 185 reviews completed by 44 reviewers. We had an average of 2.9 reviews per submission with reviewers contributing on average 4.2 reviews. Notably, four reviewers contributed 10 or more reviews and we would like to take this opportunity to thank the session organizers and reviewers for their efforts.

The call for papers for the upcoming Annual meeting in Indianapolis is now open. We expect to have an exciting program with summaries on the following topics:

- General TH
- Experimental TH
- Computational TH
- Fundamentals of Two-Phase Flow
- Advanced Reactor TH
- High-Resolution TH
- Recent Advances in TH Facilities, Capabilities, and Activities

The full call for papers can be found [here](#). The meeting will be held June 11th - 14th. Summaries are due February, 6th.

At the 2022 ANS Winter Meeting, the THD Program Committee meeting will be held online on Sunday November 6th from 11am – 1pm (CST). It can be accessed [here](#) via Zoom.

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Technical Program Committee Report, cont.

Finally, we would like to welcome Prof. Izabela Gutowska from Oregon State as the incoming PC Assistant Chair! We look forward to working together over the next three years and continuing to serve the THD.

As always, we would like to encourage our members to actively participate by attending our meetings, submitting paper summaries, volunteering to organize sessions, and supporting the peer-review of the papers.

Thank You,

Dillon Shaver
Argonne National Laboratory
THD PC Chair

Izabela Gutowska
Oregon State University
THD Assistant PC Chair

PCChair@thd-ans.org

Winter Meeting 2022 Technical Sessions November, 14-16 2022

Session	# of papers	Time Slot (MST)
Multiphase Thermal-Hydraulics: Challenges in Computation and Experiment	panel	Monday 1:00pm
Machine Learning Applications in Thermal Hydraulics	4	
Reactor Demonstration Updates in the Advanced Reactor Demonstration Program (ARDP) - RPD	panel	
Thermal Hydraulics Issues in Licensing of Advanced Reactors	panel	Monday 3:15pm
NRIC Virtual Test Bed (VTB): I - RPD	5	
Experimental Facilities and Capabilities for Thermal Hydraulic Testing	panel	Tuesday 10:00am
Experimental Thermal Hydraulics: I	4	Tuesday 1:00pm
Computational Thermal Hydraulics	5	
NRIC Virtual Test Bed (VTB): II - RPD	5	
CFD for Advanced Reactors	5	Tuesday 3:15pm
Experimental Thermal Hydraulics: II	3	
General Thermal Hydraulics	4	Wednesday 8:00am
Experimental Two-Phase Flow	5	
Computational Two-Phase Flow	5	Wednesday 10:00am
Advanced Reactor Thermal Hydraulics: I	5	
Advanced Reactor Thermal Hydraulics: II	4	Wednesday 1:00pm
Computational Fluid Dynamics: I	5	
Thermal Hydraulics for Heat Pipes and Microreactors	5	Wednesday 3:15pm
Computational Fluid Dynamics: II	3	

Statistics on NUTHOS-13

September 5-10, 2022 • Hsinchu, Taiwan

Number of Participants

Participants (228)

Session Chair Speaker Presenter	Taiwan	37
	International	141
Delegate	Taiwan	35
	International	15
Total		228

- 70% International Participants
- 30% Domestic Participants

Countries (19)

Belgium	1
Canada	1
China	38
Finland	1
France	3
Germany	15
India	2
Iran, Islamic Republic	4
Italy	4
Japan	28
Lithuania	4
Netherlands	1
Poland	2
South Korea	32
Spain	1
Sweden	5
Switzerland	2
Taiwan	72
United States	12
Total	228

Attendees by Session

Date	Room	Time (GMT+8)	Session	Attendee
Day I 6-Sep-22	Room 1	13:00-15:20	Opening Session + Plenary Session I ~ III	138
		15:50-17:10	Fundamental Thermal-Hydraulics - I	66
		17:25-18:45	Fundamental Thermal-Hydraulics - II	47
	Room 2	19:00-20:20	Fundamental Thermal-Hydraulics - III	40
		15:50-17:10	Computational Thermal-Hydraulics - I	64
		17:25-18:45	Computational Thermal-Hydraulics - II	45
	Room 3	19:00-20:20	Computational Thermal-Hydraulics - III	42
		15:50-17:10	Experimental Thermal-Hydraulics - I	42
		17:25-18:45	Experimental Thermal-Hydraulics - II	33
	Room 4	19:00-20:20	Experimental Thermal-Hydraulics - III	29
		15:50-17:10	Safety and Severe Accidents - I	59
		17:25-18:45	Safety and Severe Accidents - II	45
Day II 7-Sep-22	Room 1	13:00-14:00	Keynote Session 1 & 4	67
		14:15-15:35	Special Session I- Decommission	42
		15:50-17:10	Special Session II- Decommission	36
	Room 2	17:25-18:45	Special Session III- Spent Fuel Management	26
		19:00-20:20	Computational Thermal-Hydraulics - V	35
		13:00-14:00	Keynote 2 & 5	42
	Room 3	14:15-15:35	Computational Thermal-Hydraulics - IV	35
		15:50-17:10	Fundamental Thermal-Hydraulics - IV	41
		17:25-18:45	Experimental Thermal-Hydraulics - IV	25
	Room 4	19:00-20:20	Plant Operation, Diagnostics, Monitoring and Maintenance	22
		13:00-14:00	Keynote 3 & 6	44
		14:15-15:35	Thermal-Hydraulics and Safety of Advanced Reactors - I	35
Day III 8-Sep-22	Room 1	15:50-17:10	Thermal-Hydraulics and Safety of Advanced Reactors - II	36
		17:25-18:45	Small Module Reactors and Micro Reactors - I	42
	Room 2	19:00-20:20	Small Module Reactors and Micro Reactors - II	40
		14:15-15:35	Safety and Severe Accidents - IV	59
	Room 3	15:50-17:10	Safety and Severe Accidents - V	36
		17:25-18:45	Safety and Severe Accidents - VI	30
Day III 8-Sep-22	Room 4	19:00-20:20	Safety and Severe Accidents - VII	27
		13:00-15:00	Special Session-Development and Prospect of Nuclear Backend	60
Day III 8-Sep-22	Room 1	15:20-18:00	Panel Discussion-SMR and Micro Reactors + Closing Session	87
		13:00-15:00	Fundamental Thermal-Hydraulics - V	33

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Oral Presentations

Track	Theme	Full Paper	Technical Session
1	Fundamental Thermal-Hydraulics	23	5
2	Computational Thermal-Hydraulics and CFD Method	24	5
3	Experimental Thermal-Hydraulics	17	4
4	Safety and Severe Accidents	32	7
5	Thermal-Hydraulics and Safety of Advanced Reactors	9	2
6+7	Plant Operation, Diagnostics, Monitoring and Maintenance	4	1
8	Small Module Reactors and Micro Reactors	10	2
9	Special Sessions- Decommission and Spent Fuel Management	13	3
TOTAL		132	29

Country	Author
Belgium	1
China	27
Finland	1
France	3
Germany	12
India	3
Italy	3
Japan	19
Lithuania	3
Netherlands	1
Poland	1
South Korea	24
Spain	1
Sweden	3
Switzerland	2
Taiwan	25
United States	3
Countries Total	17

Honors and Awards Committee Report

2022 THD Technical Achievement Award

The Honors and Awards Committee received outstanding nominations for the 2022 Thermal Hydraulics Division Technical Achievement Award (TAA). Two recipients were selected for the 2022 TAA and they are Dr. Upendra S. Rohatgi (Brookhaven National Laboratory) and Dr. Bao-Wen Yang (DEQD Institute for Advanced Research in Multiphase Flow and Energy).

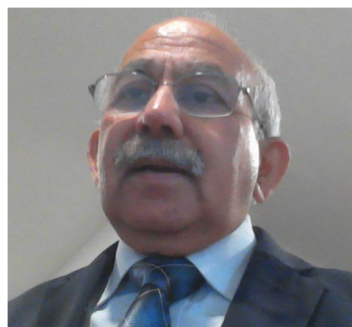
Dr. Rohatgi, Senior Mechanical Engineer and Senior Scientist at the Brookhaven National Laboratory, received this award *“For his exceptional contributions to thermal-hydraulic theory and applications, experimental facility scaling, numerical methods, and verification and validation of software.”*

Dr. Yang, CICHME Chair Professor, Chief Scientist, and Director at DEQD Institute for Advanced Research in Multiphase Flow and Energy, received this award *“For his significant and impactful contributions to the advancement of rod bundle CHF, subchannel thermal-hydraulics, advanced fuel design, and reactor safety.”* The TAA is the highest award the THD bestows. The Honors and Awards Committee congratulates Dr. Rohatgi and Dr. Yang on receiving this distinguished award.

Dr. Rohatgi and Dr. Yang will be recognized at the THD Award Ceremony at the upcoming 2022 ANS Winter Meeting (scheduled to immediately follow the Thermal Hydraulics Issues in Licensing of Advanced Reactors session on Monday afternoon November 14, 2022). As a tradition, the two TAA recipients are invited to each deliver a TAA lecture at the 20th International Topical Meeting on Nuclear Reactor Thermal Hydraulics (NURETH-20) to be held from August 20 to 25, 2023, at the Washington Hilton in Washington, DC.

2023 Bal-Raj Sehgal Memorial Award

The Bal-Raj Sehgal Memorial Award was established by the THD in 2020 to recognize an early-career to a mid-career individual for his/her exceptional and/or sustained contributions to the thermal-hydraulics field with a particular focus on the application of thermal-hydraulics to nuclear reactor safety. The Honors and Awards Committee received excellent nominations for the 2023 Bal-Raj Sehgal Memorial Award. Dr. Annalisa Manera, Professor of ETH-Zurich/University of Michigan was selected for the award *“For her novel contributions to high-resolution thermal-hydraulics experiments, and the development of innovative multi-physics and multiscale CFD-based computational tools for nuclear reactor applications.”*



Dr. U. Rohatgi



Dr. B-W Yang

Professor Manera will be recognized at the upcoming NURETH-20 to be held in August 2023 in Washington, DC, with a keynote lecture to be delivered at the same conference. Please join us to congratulate our second Bal-Raj Sehgal Memorial Award recipient! The Honors and Awards Committee wishes to acknowledge the Sehgal family for the generosity of establishing this award.

In addition to the TAA and Bal-Raj Sehgal Memorial Award, the THD Honors and Awards Committee plans to make the 2022 Best Paper Award selection from the papers presented at the ATH'22 and NUTHOS-13 conferences. Furthermore, THD recently re-established a service award, the THD Meritorious Service Award, to recognize an individual for sustained and exemplary service to the nuclear thermal-hydraulic profession. The next deadline for the service award nomination submission is March 1, 2023



Dr. A. Manera

[Continued on p. 9](#)

THD CSC Report

No updates

Scholarship Committee Report

W. David Pointer

The American Nuclear Society Thermal Hydraulics Division awards two annual graduate student scholarships: the Lawrence E. Hochreiter Graduate Scholarship and the Vincent J. Esposito Graduate Scholarship.

The **Lawrence E. Hochreiter Scholarship** was established by the ANS THD in 2019 and first awarded for the 2020-2021 academic year. The scholarship honors Dr. Lawrence E. Hochreiter, pioneer in nuclear thermal hydraulics modeling and nuclear safety analysis at Westinghouse Electric Company and the Pennsylvania State University, who was an active member of the Thermal Hydraulics Division. The scholarship is awarded to a graduate student in nuclear science and engineering who is studying topics related to nuclear thermal hydraulics.

Lawrence E. Hochreiter Graduate Scholarship Recipients

2022 Arturo Cabral
2021 Adam Kraus
2020 Ishak Johnson

The **Vincent J. Esposito Scholarship** was established by the ANS THD in 2020, with the generous support of the Esposito family, and was first awarded for the 2022-2023 academic year. The scholarship honors the ongoing contributions of Dr. Vincent J. Esposito, who is an Adjunct Professor at the University of Pittsburgh, former Vice President of the Nuclear Fuel Business Unit of Westinghouse Electric Company, and the 2013 American Nuclear Society Glenn T. Seaborg Congressional Fellow.

Honors and Awards Committee Report, cont.

(<http://thd.ans.org/awards/meritorius-service-award/>). These award selections will be reported in the THD 2023 Spring Newsletter, and the awards will be presented at the 2023 ANS Annual Meeting in Indianapolis, IN.

Finally, we would like to take this opportunity to thank the THD Honors and Award Committee members and all the nominators for their dedicated work! Congratulations to all our well-accomplished and deserving colleagues!

Xiaodong Sun
2021-2024 THD Honors and Award Committee Chair
xdsun@umich.edu

W. David Pointer
2022-2023 THD Honors and Award Committee Vice Chair
pointerwd@ornl.gov

The scholarship honors the ongoing contributions of Dr. Vincent J. Esposito, who is an Adjunct Professor at the University of Pittsburgh, former Vice President of the Nuclear Fuel Business Unit of Westinghouse Electric Company, and the 2013 American Nuclear Society Glenn T. Seaborg Congressional Fellow. The scholarship is awarded to a first-year graduate student in nuclear science and engineering who is studying topics related to nuclear thermal hydraulics.

Vincent J. Esposito Scholarship Recipient
2022 Brandon Aranda

Important Dates

- November 1, 2022 ANS Scholarship Program Announced
- November 15, 2022 ANS Scholarship Applications Open
- February 1, 2023 ANS Scholarship Application Deadline

Nominating Committee Report

The nominating committee met several times during the past months and selected the following outstanding members for several positions in the division. We note that the nominations have been sent to the Executive Committee Meeting for approval and a vote was then held. The nominations became final on October 10th 2022.

If you wish to serve on any position for the division we encourage you to reach out to the division leadership. We also recommend to first volunteer to work on the program committee of the division. We typically select EC members and other candidates for senior leadership positions from active members of the Program committee.

Division Officers Nominations:

- Vice Chair/Chair-Elect: Igor Bolotnov (NCSU)
- Secretary: Steve Bajorek (NRC)
- Treasurer: Ferry Roelofs (NRG)

EC Member Nominations:

- Term Expires June 2026: Fan-Bill Cheung (PSU), Chul-Hwa Song (KAERI), Izabela Gutowska (OSU), Donna Guillen (INL), Ling Zou (ANL)

Conference Screening Committee Nominations:

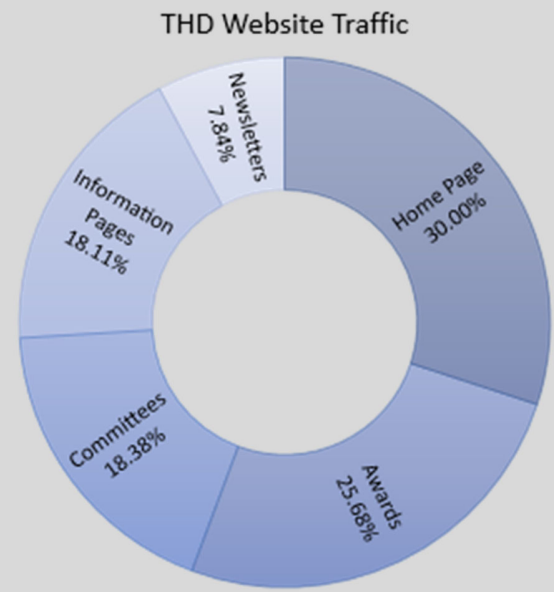
- Term Expires June 2027: John Luxat (McMaster), Elia Merzari (PSU)

Scholarship Committee Nominations:

- Term Expires June 2026: Don Todd (PNNL), Piyush Sabharwall (INL)

Webmaster Report

Over the past six months, the [division website](#) has updated to reflect the design and layout of the [ANS national website](#), as well as provided updates to upcoming conferences, deadlines, and events as they relate to the division. New to the website was the addition of analytics to help improve the website and find the areas of highest engagement. Apart from the home page, the [awards](#), [newsletters](#) and [executive committee](#) were the top visited pages.



Content has been updated, and in the next six months, some big changes are coming to the division website. As more content has been added and the role of the website has shifted to the strategic vision of engaging the broader thermal hydraulic community, the website needs to (1) continue to provide content for actively engaged members, (2) provide information relevant to upcoming division events and structure and (3) facilitate the engagement of existing and recruitment of new members. To meet these needs, the next six months will see updates and standardization of the various web pages as well as the addition of pages to support members new to THD.

-Trevor Kent Howard
ANS THD Webmaster

Financial Report

The budget for 2023 has been proposed and approved by the THD EC. Table 1 summarizes the budget and shows how it has changed since 2021. Table 2 shows for all four award funds. Of note are the following:

- 2.The TAA+Service award account started at a fund level of \$75,649, with incomes from investment gain (\$9,327) resulting in a value of \$80,826 as of March 31, 2022. Two TAA awards of \$2,000 in 2022 and 2 proposed TAA awards of \$2000 each in 2023 leave the account in good shape.
- 3.With the investment gain of \$10,411, the Lawrence Hochreiter scholarship account reaches a new balance of \$91,843, not including the investment gain/loss in 2022. This accounts for \$3000 scholarship award in 2022. The projected balance with 2021 investment gain is \$91,843.
- 4.The recently established Esposito and Bal-Raj Sehgal Memorial Award were originally been funded at \$75,000 and \$23,000 respectively. The projected gains in each have increased their values to \$86,248 and \$23,761 respectively. These awards will be given every other year.

Stephen M. Bajorek
THD Treasurer (2022-2023)

Table 1

	2021 Actual	2022 Proposed Budget	2022 Actual through 8/31/2022	2023 Proposed
Balance Forward from Previous Year	\$44,270	\$43,653	\$43,653	\$41,007
Budget Funds				
Member Dues Allocation (\$2/ full dues member; \$1 / reduced dues member)	\$802	\$1,604	\$384	\$1,536
Division Income – Division Meetings				\$24,746
Total Income	\$1,606	\$1,604	\$384	\$26,282
Budget Expenses				
Newsletters, Website				
Awards & Plaques	\$1,223	\$1,250		\$1,250
National Meeting Costs				
Topical Meeting Costs				
Division Officer Expenses				
Student Support	\$500	\$2,500	\$1,000	\$3000
Future Activity				
Scholarship/NEED Funding	\$500	\$500	\$500	\$500
YMG Support				
Other Expenses				
Total Expenses	\$2,223	\$4,250	\$1,500	\$4,750
Net	(\$617)	(\$2,646)	(\$1,116)	\$26,282
Total Year End Funds	\$43,653	\$41,007	\$42,537	\$62,539

Table 2 ANS THD Awards Funds

	Hochreiter:	TAA/Service:	Esposito:	Sehgal:
Balance Forward from 12/31/2020	\$ 84,433	\$ 75,649	\$ 75,000	\$ 23,000
Investment gain (up to 12/31/2021)	\$ 10,411	\$ 9,327	\$ 9,248	\$ 2,836
Division Designated (2021)			\$ 2,000	
Total Income:	\$ 2,589	\$ 9,327	\$ 11,248	\$ 2,836
Budget Expenses:				
Awards	\$ (3,000)	\$ (4,000)	\$ -	\$ (2,000)
Plaques	\$ -	\$ (150)	\$ -	\$ (75)
Other expenses:				
Net:	\$ 7,411	\$ 5,177	\$ 11,248	\$ 761
Spending Limit (9.08%)	\$ 7,862	\$ 6,919	\$ 7,383	\$ 2,034
Total Year End funds (Projected, 12/31/2022)	\$ 91,843	\$ 80,826	\$ 86,248	\$ 23,761



20th International Topical Meeting on Nuclear Reactor Thermal Hydraulics (NURETH-20)

August 20-25, 2023 | Washington, DC, USA | Washington Hilton



EUROPEAN NUCLEAR SOCIETY



한국원자력학회
Korean Nuclear Society



Sociedad Nuclear Mexicana

CALL FOR PAPERS

EXECUTIVE CHAIRS

General Chairs

Raymond Furstenau, USNRC
Bao-Wen Yang, DEQD
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FINAL FULL PAPERS DUE: **April 14, 2023**

GUIDELINES

The limit for abstract submissions is 250 words. The limit for full-paper submissions is 14 pages. Papers exceeding 14 pages will be rejected. If an exception is made and a paper over 14 pages is accepted, page charges are \$100/page for p. 15 and above. The conference proceedings will be distributed digitally. Selected papers will be published in the special issues of *Nuclear Technology*, *Nuclear Science and Engineering*, *Fusion Science and Technology*, and *Nuclear Engineering and Design*.

ABOUT THE MEETING

NURETH is the premier gathering for experts in nuclear reactor thermal hydraulics and related topical areas. This meeting is held every two years. The Washington DC ANS Section is pleased to host NURETH-20 in Washington, DC, USA. Washington, DC is more than the capital of the USA—it is the center of both support and regulation of the nuclear industry. Washington DC is not only a center of government but also a tremendous visitor center with cultural attractions for all.

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TECHNICAL TRACKS

HIGH-QUALITY PAPERS (14-PAGE MAXIMUM) ARE SOLICITED IN THE FOLLOWING AREAS:

1. FUNDAMENTAL THERMAL HYDRAULICS

- 1A. Two-Phase Flow and Heat Transfer
- 1B. Boiling and Condensation
- 1C. Interfacial Area Transport
- 1D. Critical Heat Flux and DNB
- 1E. Natural Circulation in Reactor Systems
- 1F. Thermal Hydraulic Scaling
- 1G. General

2. COMPUTATIONAL THERMAL HYDRAULICS

- 2A. Thermal Hydraulics System Code Development and Analysis
- 2B. Computational Fluid Dynamics (CFD)
- 2C. Multiphase CFD
- 2D. Multiphysics Development and Applications
- 2E. DNS for Model Development
- 2F. Multiscale CFD and Coupling with System Codes
- 2G. Subchannel Thermal Hydraulic Analysis
- 2H. General

3. EXPERIMENTAL THERMAL HYDRAULICS

- 3A. Experimental Methods and Instrumentation
- 3B. Integral and Separate Effects Tests
- 3C. Tests for Assessment of CFD
- 3D. Experimental Databases and Preservation
- 3E. Experiments for Advanced and Special Purpose Reactors
- 3F. Rod Bundle Experiments
- 3G. Critical Heat Flux and Post-CHF Experiments
- 3H. UQ Methods and Best Practices for Experiments
- 3I. General

4. VERIFICATION, VALIDATION AND UNCERTAINTY QUANTIFICATION (VUQ)

- 4A. Verification and Validation of Systems Codes
- 4B. Verification and Validation of Subchannel Codes
- 4C. Best Practices in CFD
- 4D. Uncertainty Methodology Development
- 4E. BEPU Analysis and Challenges in Licensing
- 4F. General

5. WATER-COOLED REACTOR OPERATIONS AND ANALYSIS

- 5A. LWR Operation and Safety Analysis
- 5B. HWR Operation and Safety Analysis
- 5C. VVER Operation and Safety Analysis
- 5D. BWR Instabilities and Nonlinear Dynamics
- 5E. Small Modular LWRs
- 5F. General

6. SEVERE ACCIDENTS

- 6A. Severe Accident Scenarios and Source Term
- 6B. In-Vessel Corium and Debris Bed Coolability
- 6C. Ex-Vessel Corium Interaction and Coolability
- 6D. Containment TH, Hydrogen and Fission Product Behavior
- 6E. Design Features to Prevent Severe Accidents
- 6F. Uncertainty in Severe Accident Modeling
- 6G. Severe Accidents in Advanced Reactors and Nuclear Installations
- 6H. General

7. NEW AND ADVANCED REACTORS

- 7A. High-Temperature Gas Cooled Reactors
- 7B. Liquid Metal Cooled Reactors
- 7C. Molten Salt Reactors
- 7D. Supercritical Water Cooled Reactors
- 7E. Microreactors
- 7F. Reactors for Space Applications
- 7G. Offshore Nuclear Platforms
- 7H. Advanced Reactor Fuel
- 7I. General

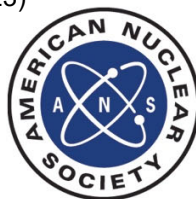
8. SPECIAL TOPICS

- 8A. Hydraulics in Medical Isotope Production
- 8B. Fluid-Structure Interactions
- 8C. Accident Tolerant Fuel
- 8D. Machine Learning and Artificial Intelligence for TH
- 8E. Test and Prototype Reactors
- 8F. Thermal Hydraulics of Fusion Reactors
- 8G. International Benchmarks
- 8H. Reliability of Passive Systems
- 8I. Post-Fukushima Thermal Hydraulic Research
- 8J. Integrated Energy Systems
- 8K. Decommissioning
- 8L. NEAMS Thermal-Hydraulics IRP
- 8M. Memorial Session in Honor of Prof. Peter Griffith
- 8N. Liquid Metal Heat Transfer
- 8O. BEPU for Pressurized Thermal Shock
- 8P. Flow Induced Vibrations in (GO-VIKING)
- 8Q. OECD/NEA ARC-F Project
- 8R. Testing and Analysis for Lead Fast Reactor Development



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