



### 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

Chul-Hwa Song  
[chsong@kaeri.re.kr](mailto:chsong@kaeri.re.kr)

##### Vice Chair/Chair-Elect

Wade R. Marcum  
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##### Secretary

Elia Merzari  
[ebm5351@psu.edu](mailto:ebm5351@psu.edu)

##### Treasurer

Bao-Wen Yang  
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##### Immediate Past Chair

W. David Pointer  
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#### Executive Committee

##### Terms Expiring June 2020

Yang Liu  
John C. Luxat  
Annalisa Manera  
Hisashi Ninokata  
Piyush Sabharwal

##### Terms Expiring June 2021

Fan-Bill Cheung  
Yong Hoon Jeong  
Dillon R. Shaver  
Xiaodong Sun  
Mathew D. Zimmer

##### Terms Expiring June 2022

Fatih Aydogan  
Igor Bolotnov  
Lane Carasik  
Yassin Hassan  
Robert P. Martin

#### Standing Committees

##### Technical Program Chair

Igor Bolotnov

##### Honors & Awards Chair

DuWayne Schubring

##### Webmaster

Marilyn Delgado

##### YMG Liaison

Mathew D. Zimmer

## A Message from the Chair

Dear Colleagues,

It has been another successful year for the Thermal Hydraulics Division (THD) with steadily increasing membership and strong finances. I would like to thank all of the Division members for their continued support and dedication toward the success of our Division. I extend my special thanks to those who volunteered to serve as paper reviewers or organize technical sessions, and to those who actively participated in various THD committees' tasks. Thanks to their efforts, our Division has been and continues to be one of the strongest professional divisions of ANS.

As noted above and reported in the previous THD newsletters, our Division membership has been growing continuously over the last ten years while the ANS membership at large has contracted during the same period under some difficult situations. In fact, as of December 2019, we reached the highest record of 1,262 members in our THD membership, which represents 13.8% of the total ANS membership. I am also quite encouraged to note that 30% of our Division's membership is comprised of young members including students and recent graduates, who will lead the future of our Division.

We are moving well forward to have success in Division's activities on technical meetings. As usual, THD was well represented at the 2019 ANS Winter Meeting in Washington, DC, with 78 presentations in 17 different technical sessions. In addition, just prior to this meeting, the Division-sponsored "Young Professional Congress 2019 (YPC'19)" was held successfully, where I had been invited on behalf of THD to encourage participants from our thermal-hydraulics community. In 2020 Annual Meeting in Phoenix, we expect a total of 34 summaries to be presented in 8 different technical sessions, together with 3 panel sessions on challenges and opportunities of advanced reactors and the thermal



performance of integrated energy system. I would like to thank the session organizers and paper reviewers in anticipation of another successful thermal-hydraulics community gathering. The ever-growing strength of our Division is due to the collective and voluntary efforts of our Division leaders and members.

Unfortunately, several international meetings were postponed or cancelled due to the unprecedented global spreading of the COVID-19 outbreaks this spring. These include ATH'20 in Paris, France, RIC-2020 in Washington, DC, and ICAPP'20 in Abu Dhabi, UAE, all originally scheduled in March, and NUTHOS-13 scheduled in Vancouver, Canada in August.

[Continued on p. 2](#)

### In this issue

Membership **P.2**

Technical Programs **P.3**

ANS Annual Meeting Sessions **P.4**

Conference Announcements **P.4**

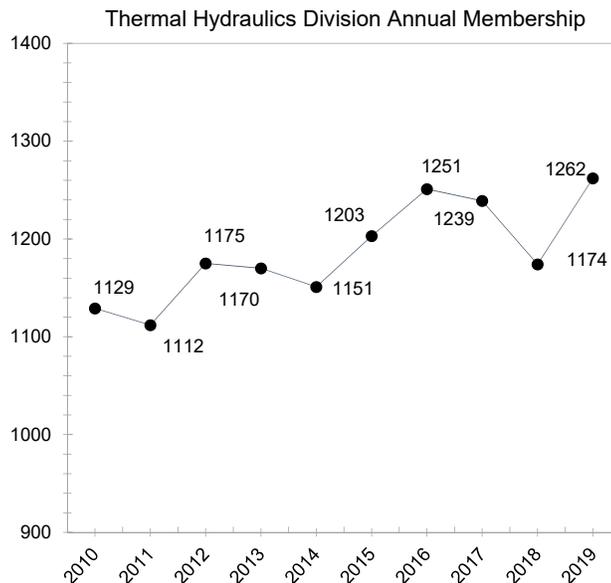
Financials **P5**

## Membership Committee Report

Membership of the ANS Thermal Hydraulics Division is tracked based on membership renewals and applications submitted during each calendar year.

The most recent available data are from early 2020, which indicate a total of 1262 members, recording the highest division membership of for Thermal Hydraulics in history. This exciting feat is a direct result from the direct contributions of all ANS THD members and should be viewed as a positive metric for success as a result of this effort. Continued membership support is vital to our furthering the mission of our division. All THD members are encouraged to contribute to the THD-sponsored meetings, encourage colleagues to join ANS and THD, and to participate in THD governance as their time permits.

W. David Pointer  
Oak Ridge National Laboratory  
THD Membership Committee Chair (2019-2020)  
pointerwd@ornl.gov



### Message from the Chair, cont.

There are a number of upcoming meetings of interest to our thermal-hydraulics community. Of particular interest are ATH'20 in Paris, which is rescheduled on October 20 – 23, the 2020 ANS Winter Meeting in Chicago on November 15 – 19, and NURETH-19 conference in Brussels from August 29 to September 3, 2021. It is anticipated that the 2020 ANS Winter Meeting in Chicago will be one of the most exciting meetings as our Division is organizing special panel sessions and events to celebrate the 40<sup>th</sup> anniversary of the inaugural NURETH conference.

I am delighted to announce that the first recipient of Lawrence E. Hochreiter Graduate Scholarship has been selected this spring based on the evaluation of the Scholarship Evaluation Committee. The Division is now preparing to establish a new biennial award called the Bal-Raj Sehgal Memorial Award, honoring the late Prof. Sehgal who passed away on February 26, 2018 at age 84. The award will memorialize his extraordinary legacy, positive influence, and remarkable contributions to thermal-hydraulics and nuclear reactor safety. Prof. Sehgal's family had pledged to donate an endowment fund to establish the award, and the proposal was approved at the previous Division Executive Committee (EC) meeting. Following the decision by the EC, Prof. Jong Kim, who had been a friend and colleague of Prof. Sehgal over several decades, recently led a task to draft the 'Award Selection Criteria' in consultation with Prof. Sehgal's family and Prof. Nam Dinh. The Division H&AC will finalize the draft, which will be submitted for approval to the next Division EC meeting, and subsequently to ANS National, aiming to deliver the first Award at the next NURETH-19 in 2021.

As a follow-up after the last November meeting in DC, the ANS PDC launched a Taskforce to discuss issues or considerations with the upcoming changes to the Society and professional divisions in conjunction with successful preparation of the ANS Change Plan 2020. I would like to take this opportunity to thank Dr. E. Merzari who kindly volunteered to participate in this task representing the Division.

On behalf of the Division, I would like to welcome new THD officers for 2020-2021 term: Dr. Wade Marcum, who will automatically succeed me as Division Chair, and the newly elected Division officers: Dr. Elia Merzari as Vice Chair, Dr. Bao-Wen Yang as Secretary, and Dr. Annalisa Manera as Treasurer. I would also like to welcome the re-elected and the new Division EC members: Drs. John Luxat, Hisashi Ninokata, Yang Liu, Piyush Sabharwall and Caleb Brooks. I thank them, in advance, for their service.

It has been my great privilege and honor to work with you and serve as Chair of the Division for the 2019-2020 term. I would like to take this opportunity to express my appreciation for the great efforts of advancing the Division and the thermal-hydraulics community to: my Division officers, EC and PC members, and the Webmaster. I hope to see you at the 2020 ANS Annual Meeting in Phoenix. Thank you very much!

Chul-Hwa SONG  
ANS 2019-2020 THD Chair  
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# Technical Program Committee Report

The strong THD presence at the ANS national meetings continues after a positive 2019 ANS Winter Meeting.

A total of **35** summaries were submitted, out of which, based on the reviewer recommendations, a total of **34** summaries are expected to be presented at this Annual Meeting. Again, let us take this opportunity to thank the session organizers and reviewers for their efforts: 85 reviews were completed for this Annual Meeting (on average, over 2.4 reviews per paper). All **9** sessions sponsored by THD are listed on the right. One of those sessions (on VTR) is co-sponsored with RPD.

This Fall THD is co-sponsoring a 2020 Advances in Thermal Hydraulics meeting which is organized in Paris, France this time and will be held on October 20 – 23<sup>rd</sup>, 2020 (postponed from Spring). It is an exciting opportunity to present your research in Europe. The submission window is now closed, however the papers are being accepted from the cancelled NUTHOS-13 meeting.

Moreover, we expect the submission website for the 2020 ANS Winter Meeting to be open mid-June, which will be held in Chicago, IL in November 15-18, 2020. THD is again offering a vibrant program with 12 sessions (including three panels).

Note that this year THD celebrates **40 years** of NURETH conference

## ANS Annual THD Technical Sessions

Phoenix, AZ, Arizona Grand Resort  
June 7-11, 2020

Session	# of papers	Time Slot
Experimental Thermal Hydraulics – I	5	Mon 1pm
General Thermal Hydraulics – I	5	Mon 3:30pm
Two-phase Flow and Heat Transfer Fundamentals	4	Mon 3:30pm
Computational Thermal Hydraulics – I	5	Tue 10am
Thermal Hydraulics Activities for the Versatile Test Reactor	4	Tue 1:30pm
Thermal Performance for Integrated Energy Systems: Design, Development and Deployment (P)		Tue 1:30pm
Thermal Hydraulics of Nuclear Micro-Reactors and MSR	5	Wed 1:30pm
Computational Thermal Hydraulics – II	5	Wed 3:35pm
Experimental Thermal Hydraulics – II	4	Thu 8am

Continued on p. 4

and we have two sessions dedicated to this occasion.

1. Two-phase flow and heat transfer fundamentals
2. Computational Thermal Hydraulics
3. General Thermal hydraulics
4. Experimental Thermal Hydraulics
5. Education in Thermal Hydraulics – Part II [P]
6. Options in Small-Modular Reactors [P]
7. 40 years of NURETH: How is NURETH impacting nuclear research
8. 40 years of NURETH: Highlights [P]
9. Severe Accident Modeling
10. Molten Salt Thermal-Hydraulics
11. Multiphysics Simulation
12. Young Professional Thermal-hydraulic Research competition

At the 2020 ANS Annual Meeting in Phoenix, AZ, the THD Program Committee meeting will be held on Sunday June 17th, 2019, starting at 2:30 pm (check the latest program for location). Anyone interested in the Program Committee activities is invited to participate.

Finally, we would like to express our gratitude to all of the colleagues who devote their time to the Division's activities. Thanks to your dedicated efforts, we are able to put together strong programs at many meetings. These meetings remain as the prominent venue for scientific information exchange in the thermal-hydraulics community.

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.

Igor Bolotnov  
NC State University  
THD PC Chair

Dillon Shaver  
Argonne National Lab

## NUTHOS-13

Scheduled for August 2020  
Cancelled –

Authors invited to submit  
to ATH'20 and  
NURETH-19

## ATH'20

THD is co-sponsoring with Société Française d'Énergie Nulceaire (SFEN) the International Topical meeting on Advances in Thermal Hydraulics meeting (ATH'20) which will be held at EDF Lab Paris-Saclay, France. The meeting was first scheduled for March 31– April 3, 2020 but has been then postponed to 20-23 October 2020 because of the Covid-19 crisis. See <https://www.sfen-ath2020.org> for more information. The research and Development division of Electricité de France (EDF R&D) and in particular Fluid Mechanics, Energy and Environment Department (MFEE) have widely contributed to the meeting logistical and technical organizations. Three French companies co-sponsored the event; Framatome, CEA and Naval Group.

It is an exciting opportunity to present your research in Europe. The submission window has been closed but you may still send a contribution to [sofiane.benhamadouche@edf.fr](mailto:sofiane.benhamadouche@edf.fr). Few contributions from NUTHOS-13 will be redirected to ATH'20.

Except the additional contribution, the organization of the conference will not change. A poster session dedicated to the student Prize will be held on Thursday from 11:15 to 12:55 in the Foyer. The conference is starting from Tuesday, October 20, 2020 through Friday, October 23, 2020. On Tuesday afternoon, in the Auditorium, the Opening Plenary will start with an Introductory Lecture by Prof. Bernard Bigot (Director-General of the ITER Organization) who will discuss the challenges of the ITER Project and give a Global view on ITER Cooling Water System. Then, from 03:30 to 05:30, a Special Panel about Machine Learning and Thermal Hydraulics will be animated by Dr. Christophe Calvin (CEA). Publication of selected papers in archival journals will also be arranged by the organizers in Journal of Nuclear Engineering and Design and EPJ-N.

The ATH'20 technical program as it was scheduled for spring consists of 95 oral presentations. We received 95 full-length technical articles in total from 57 institutions among them 46 from Europe (France 27, Germany 5, Belgium; Italy and the UK 3, The Netherlands 2, Switzerland; Slovenia and Russia 1), 31 from Asia (Rep. of China 21, Rep. of Korea 4, Israel and Taiwan 2, India and United Arab Emirates 1) and 18 from America (USA 16, Canada and Mexico 1). In total, 81 institutions from all over the world are author or co-author of an article (Europe 36, Asia 26 and America 19).

# Financial Report

The budget for 2021 is also proposed and included in Table 2 (blue column) for approval.

As shown in the attached Table 1 for all three award funds,

1. The TAA award account started at a fund level of \$35,881, with incomes from investment gain (\$7,255, a 20.22% annual gain) and division designated fund transfer (\$8,192 transferred from the general account), after deducting \$1,000 for TAA award and \$72.5 for the plaque, the expected budget balance will be **\$50,255** (not account for the investment gain/loss in 2020). This new balance will raise the spending limit to \$2,472.55 (4.92%) sufficient to support the increase of TAA award from \$1,000 to \$2,000.

Table 1: ANS THD Awards Funds

	Hochreiter	TAA	Services
<b>Balance Forward from 12/31/2018 Year</b>	\$ 63,000	\$ 35,881	\$ -
<b>Budget Funds</b>			Starting 2020
Investment Gain (up to 12/31/2019)	\$ 12,739	\$ 7,255	\$ -
Division Designated (2020)		\$ 8,192	\$ 21,000
<b>Total Income</b>	\$ 12,739	\$ 15,447	\$ 21,000
<b>Budget Expenses</b>			
Awards	\$ -	\$ 1,000	\$ -
Plaques	\$ -	\$ 73	\$ -
Other Expenses	\$ -	\$ -	\$ -
<b>Total Expenses</b>	\$ -	\$ 1,073	\$ -
<b>Net</b>	\$ 12,739	\$ 14,374	\$ 21,000
<b>Total Year End Funds</b>	\$ 75,739	\$ 50,255	\$ 21,000
<b>Spending Limit (4.92)</b>	\$ 3,726	\$ 2,473	\$ 1,033

Table 2: ANS THD Budget (June 6, 2020)

	2019	2019		2020		2021
	Budget	Actual through 12/31/2019	Approved Budget	Actual through 3/31/2020	Proposed Budget	
<b>Balance Forward from Previous Year</b>	\$ 51,459	\$ 51,459	\$ 87,682	\$ 72,984	\$ 43,698	
<b>Budget Funds</b>						
Member Dues Allocation (\$2/ full-member; \$1 reduced-member)	\$ 2,300	\$ 1,325	\$ 2,300	\$ 406	\$ 2,300	
Student Support (ANS Change Plan)	\$ -	\$ -	\$ -	\$ -	\$ 3,000	
Division Income	\$ 39,173	\$ 25,054	\$ -	\$ -	\$ -	
<b>Total Income</b>	\$ 41,473	\$ 26,379	\$ 2,300	\$ 406	\$ 5,300	

	2019	2019		2020		2021
	Budget	Actual through 11/6/2019	Approved Budget	Actual through 3/31/2020	Proposed Budget	
<b>Budget Expenses</b>						
Newsletters, Website	\$ -	\$ -	\$ -	\$ -	\$ -	
Awards & Plaques	\$ 1,250	\$ 851	\$ 1,250	\$ -	\$ 645	
Dispersement to Award Funds	\$ -	\$ -	\$ -	\$ 29,192	\$ -	
National Meeting Costs	\$ -	\$ -	\$ -	\$ -	\$ -	
Topical Meeting Costs	\$ -	\$ -	\$ -	\$ -	\$ -	
Division Officer Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	
Student Support	\$ 3,500	\$ 3,000	\$ 2,500	\$ 500	\$ 2,500	
Future Activity	\$ -	\$ -	\$ -	\$ -	\$ -	
Scholarship/NEED Funding	\$ 500	\$ 1,000	\$ 500	\$ -	\$ 500	
YMG Support	\$ -	\$ -	\$ -	\$ -	\$ -	
Other Expenses	\$ -	\$ 3	\$ -	\$ -	\$ -	
<b>Total Expenses</b>	\$ 5,250	\$ 4,854	\$ 4,250	\$ 29,692	\$ 3,645	
<b>Net</b>	\$ 36,223	\$ 21,525	\$ (1,950)	\$ (29,286)	\$ 1,655	
<b>Total Year End Funds</b>	\$ 87,682	\$ 72,984	\$ 85,732	\$ 43,698	\$ 45,353	

2. With the investment gain of \$12,739 (20.22% gain), the Lawrence Hochreiter scholarship account reaches a new balance of \$75,739, not including the investment gain/loss in 2020.
3. The newly established Service Award fund was set up with a disbursement of \$21,000 from the General account, which will allow a pending limit of \$1,033 (4.92%).
4. There were two major movements in the general account: an income of \$25,054 (thanks to the generous contribution from NUTH-18) and a major disbursement of \$29,192 to the award funds (\$21,000 to fund the service award, and \$8,192 to support the increase of TAA fund). The general account has new balance of \$43,792 (see Table 2).

Bao-Wen Yang  
THD Treasurer (2019-2020)

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Wade Marcum, Editor  
THD Vice Chair (2019-2020)  
<http://thd.ans.org>



**American Nuclear Society**  
Thermal Hydraulics Division