ANS Reactor Physics Division

A newsletter of the ANS Reactor Physics

FALL ISSUE

November 2018

Your RPD Leadership Team

A Message from the Chair

By Todd Palmer

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Hello, members of the Reactor Physics Division!

As this is my first message as Chair of RPD, I want to take a moment to introduce myself. I am a Professor in the School of Nuclear Science and Engineering at Oregon State University (OSU) in Corvallis, Oregon. I joined OSU (not "the OSU", just OSU…) in 1995, after spending two years as a Physicist in A Division at Lawrence Livermore National Laboratory. My technical career has focused on computational approaches to the solution of radiation transport problems with a wide variety of applications, including reactor physics, radiation detection, radiation hydrodynamics, medical physics and most recently materials science. I've been an ANS member for over 25 years, and I have directed my professional society service to both the Reactor Physics and Mathematics and Computations Divisions. I am currently serving on the ANS Board of Directors – my term expires at the end of the June meeting in 2019.

Chairing RPD is truly an honor for me, and I am excited to continue to promote the initiatives that were started under our previous Chair. I want to thank Arzu Alpan, the past Chair of RPD, for her exceptional leadership and stewardship of the Division – I'll do my best to live up the example she and other previous Chairs have set. I am pleased to have a very committed group of officers and executive committee members to help carry out the work of the Division in the coming year.

One of the more important tasks we'll be working during my term as Chair is to complete a Strategic Planning exercise for the Division. You may know that the American Nuclear Society organization is facing some significant challenges looking to the future. Some of these are budgetary, but others are existential in nature: 1) what should a nuclear-related professional society be doing?; 2) how can we best serve our membership?; 3) who should we be targeting for membership?; 4) day-to-day, how should we conduct our business and carry out our mission? Many of these same questions apply to each of the constituent components of the society. I have developed a very short survey that I will distribute to RPD membership late in November (after I receive input from the Executive Committee) that will help RPD prioritize our efforts in short and intermediate terms. Your input is essential, and the results of the survey will be communicated, along with the resulting strategic plan in the near future.

I hope you'll look through this newsletter and keep abreast of the activities of RPD. As always, don't hesitate to contact me, the officers, or the members of the Executive Committee with concerns, ideas, or suggestions. I hope to see you in Orlando!

In this issue

Reactor Physics Standards

By Dimitrios Cokinos, ANS-19 Reactor Physics Standards Chair

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Work on the revision of several ANS-19 standards has continued during the past few months.

The following Standards are in the process of being revised.

- The revised draft Standard ANS-19.1, "Nuclear Data Sets for Reactor Design Calculations" has been voted and approved by the members of the Subcommittee and it is now being balloted by the members of SRACC, our Consensus Committee. This much improved version incorporates the latest contributions to the field. This revised standard is a prime candidate for an international standard.
- Revision of ANS-19.3, "Steady State Neutronics Methods for Power Reactor Analysis" has continued during this period.
- Standard ANS-19.3.4, "Determination of Thermal Energy Deposition Rates in Nuclear Reactors" applicable to all reactor types is being revised and expanded.
- The revision of the Pressure Vessel (PV) Fluence standard, ANS-19.10, "Methods for Determining Neutron Fluence in BWR and PWR Pressure Vessel and Reactor Internals" will include the effects of fast neutron fluence at the upper and lower sections of the PV.
- Standard ANS-5.1, "Decay Heat Power in Light Water Reactors", is being revised with improved data sets from recent experiments.

As mentioned in the previous RPD Newsletter, three of our Reactor Physics standards have been adopted by the International Standards Organization (ISO) and became international standards. The three ISO-adopted standards, ANSI/ANS-19.3 ("Steady State Neutronics Methods for Power Reactor Analysis"), ANSI/ANS-19.6.1 ("Reload Startup Physics Tests for PWRs"), and ANSI/ANS-19.10 ("Methods for Determining Neutron Fluence in BWR and PWR Pressure Vessel and Reactor Internals"). Their international designation is ISO-18075, ISO-18077 and ISO-19226, respectively. Our current plans are to introduce a fourth U.S. standard to be adopted by the international nuclear community, ANSI/ANS-5.1, "Decay Heat Power in Light Water Reactors" which, as stated earlier, has been recently revised.

RPD Scholarships

By Benoit Forget, RPD Scholarship Committee Chair

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As in the past few years, the Reactor Physics Division is proud to offer two scholarships:

1) the Rudi Stamm'ler undergraduate scholarship ($3,000), and
2) the Allan Henry / Paul Greebler graduate scholarship ($3,500).

Please encourage all deserving students pursuing research in the field of reactor physics to apply. The application deadline is February 1st, 2019 and application forms can be found at http://www.ans.org/honors/scholarships/forms/.

Honors and Awards

By Dimitrios Cokinos, RPD Honors and Awards Committee Chair

cokinos@bnl.gov

EUGENE P. WIGNER REACTOR PHYSICIST AWARD

Members of the Reactor Physics Division are invited to nominate qualified candidates for the Eugene P. Wigner Award. This prestigious award was founded in 1990 to honor individuals who have made outstanding contributions to the advancement of the field of reactor physics. This award is presented to the winner during the ANS Winter meeting. A complete description of the requirements for the nomination, including a list of past winners, can be found in the ANS website under the heading of Honors & Awards, at http://www.ans.org/honors/awards/award-wigner/.

EARLY CAREER REACTOR PHYSICIST AWARD

This relatively new award was created to honor outstanding young reactor physicists, who at the time of their nomination are 39 years old or younger. This award is presented during the ANS Annual Meeting. A description can be found at http://www.ans.org/honors/awards/award-ecrpa/.

NOMINATIONS WELCOME

The Reactor Physics Division welcomes nominations for the two awards, Wigner and ECRP. Deadlines for nominations are:

Wigner Award	April 1, 2019
ECRP Award	August 1, 2019

Program Committee News

By Pavel Tsvetkov

tsvetkov@exchange.tamu.edu

I am thrilled to serve as an RPD Program Chair for the next couple of years. We are fully set for an exciting winter meeting on November 12 – 15, 2018. Over 60 papers have been accepted for presentation at the meeting and publication. We have sessions running from Monday through Thursday. We also have several panel sessions organized. In addition, there are RPD co-sponsored sessions initiated by other divisions. Overall, our division footprint in the program is pretty large. The list of technical sessions and panels is as follows at the ANS Winter meeting in Orlando, Florida. On Sunday, the program committee will be discussing upcoming meetings, membership and our approach to the best paper selection process, as well as our approaches to technical session facilitation and session chairmanship recruitment efforts.

Monday, November 12

1:00 PM
- Current Issues in LWR Core Design & Reactor Engineering Support–Panel, organizer - Moussa Mahgerefteh (Exelon)
- ENDF/B-VIII.0: Evaluation and Validation–Panel (NCSD/RPD/MCD), Michael L. Zerkle (NNL)

4:00 PM
- Reactor Physics: General—I, November 12, 4:00 PM, Taek K. Kim (ANL), William J. Walters (PSU)
- Applications of the NEAMS Workbench–Panel, organizer - Nicolas Stauff (ANL), R. Lefebvre (ORNL)
- Radiation Protection and Shielding in Aeronautics and Space Applications–Panel (RPSD, RPD, ANSTD), Robert Singleterry, Jr. (NASA)

Tuesday, November 13

10:00 AM
- Reactor Analysis Methods—I, November 13, 10:00 AM - Akio Yamamoto (Nagoya University), Nicolas Stauff (ANL)

1:30 PM
- Reactor Physics in Test & Research Reactors - I, November 13, 1:30 PM, Zeyun Wu (VCU), Yunlin Xu (Purdue)
- Micro Nuclear Reactor Concepts for Special Purpose Applications–Panel, organizer - Nicolas Stauff (ANL)

3:55 PM
- Reactor Physics in Test and Research Reactors—II, November 13, 3:55 PM - Zeyun Wu (VCU)
- Reactor Physics: General—II, November 13, 3:55 PM – Moussa Mahgerefteh (Exelon), William J. Walters (PSU)

Wednesday, November 14

10:15 AM
- Reactor Analysis Methods—II, November 14, 10:15 AM – Yunlin Xu (Purdue), Pavel Tsvetkov (Texas A&M University)
- Reactor Physics: General—III, November 14, 10:15 AM - Akio Yamamoto (Nagoya University), Javier Ortensi (INL)

1:30 PM
- Reactor Physics in Test and Research Reactors—III, November 14, 1:30 PM - Zeyun Wu (VCU)
- Reactor Physics: General—IV, November 14, 1:30 PM – Yunlin Xu (Purdue), Nicolas Stauff (ANL)

3:55 PM
- Reactor Analysis Methods—III, November 14, 3:55 PM - William J. Walters (PSU), Javier Ortensi (INL)
- Reactor Physics: General—V, November 14, 3:55 PM – Alberto Talamo (ANL)
- New Code Developments for Nuclear Criticality Safety Applications (NCSD, RPD, MCD), Luiz Leal (IRSN)

Thursday, November 15

8:00 AM
- Reactor Analysis Methods—IV, November 15, 8:00 AM, Cole Mueller (Texas A&M University), Pavel Tsvetkov (Texas A&M University)

10:25 AM
- Application and Challenges in CFD-Neutronics Coupling, November 15, 10:25 AM, Manuele Aufiero, Pavel Tsvetkov (Texas A&M University)

We began working on panels and sessions for the next-year ANS annual meeting 2019. The sessions planned are:

1. **Reactor Physics: General**. This is a standing RPD session with papers on all general reactor physics topics of contemporary interest. The session is expected to consist of invited and contributed papers.
2. **Reactor Analysis Methods**. This is a standing RPD session with papers on all reactor analysis topics of contemporary interest. The session is expected to consist of invited and contributed papers.
3. **Reactor Physics Design, Validation and Operational Experience**. This is a standing RPD session with papers on all reactor physics design, validation and operational experience topics of contemporary interest. The session is expected to consist of invited and contributed papers.
4. **Special session - Molten Salt Reactors**. Molten Salt Reactors (MSR) are currently benefiting from a lot of interest from various stakeholders, ranging from start-up companies to US DOE-NE, including investors. As a result, numerous efforts are focused on MSRs and a lot of progresses are being made. The proposed session will provide an opportunity for all to present their work related to the design and analysis of MSRs, as well as related to reactor physics codes being developed to support MSR development. Organizer - Florent Heidet, ANL, fheidet@anl.gov
5. **The Nuclear Energy Advance Modeling and Simulation (NEAMS) Workbench**. The Nuclear Energy Advanced Modeling and Simulation (NEAMS) Workbench is intended to facilitate the transition from conventional tools to high-fidelity tools by providing a common user interface for model creation, review, execution, output review, and visualization for integrated codes providing multiple physics capabilities. The Workbench enables a common user input that includes engineering scale specifications that are expanded into application-specific input requirements through the use of customizable templates. *(cont. page 4)*

RPD Program Committee

Chair: Pavel Tsvetkov
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2016/2019	
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(continued from page 3)

In this session, stimulated papers will present the new features available through the NEAMS Workbench and some example of applications obtained with it. Co-sponsorship from MCD, THD and YMG is anticipated.
Organizer - Nicolas Stauff, nstauff@anl.gov

6. **Overview of the Versatile Test Reactor.** The Versatile Test Reactor (VTR) program is a recently initiated program as part of the US DOE-NE. It aims at designing and building a fast-spectrum reactor in order to meet the material irradiation needs of national and international stakeholders. It is designed to be versatile and to allow material irradiation under various environment. The papers will provide an overview of the current state of the VTR design efforts and directions.
   Organizer - Florent Heidet, fheidet@anl.gov
7. **The Consortium for the Advanced Simulation of Light Water Reactors.** The Consortium for the Advanced Simulation of Light Water Reactors (CASL) has been developing advanced modeling and simulation tools to help the industry with plant design, operation, and assessment. This session will highlight the major outcomes from CASL over its 10 years of operation, including papers from reactor physics, thermal hydraulics, material science, along with papers discussing multiphysics applications for nuclear reactors.
   Organizer - Benjamin Collins, collinsbs@ornl.gov

In a longer-term planning, we are in the process of preparing for our next PHYSOR topical meeting. The meeting will be held in UK in 2020.

Other RPD Committees

Bylaws & Rules Committee

Chair: Arzu Alpan, Westinghouse

Ronald Ellis retired	Sedat Goluoglu University of Florida
Luiz Leal IRSN, France	Moussa Mahgerefteh Exelon
Bojan Petrovic Georgia Institute of Technology	Pavel Tsvetkov Texas A&M University
William Walters Penn State	

Honors & Awards Committee

Chair: Dimitrios Cokinos, Brookhaven National Laboratory

Robert Little Los Alamos National Laboratory	Farzad Rahnema Georgia Institute of Technology
Charles Rombough CTR Technical Services, Inc.	Paul Turinsky North Carolina State University

Standards Committee

Chair: Dimitrios Cokinos, Brookhaven National Laboratory

Allan Henry/ Paul Greebler Undergraduate Scholarship Committee

Chair: Benoit Forget, MIT

Dimitrios Cokinos Brookhaven National Laboratory	Mark DeHart Idaho National Laboratory
Thomas Downar University of Michigan	Jess Gehin Idaho National Laboratory
Scott Palmtag North Carolina State University	

Rudi Stamm'ler Graduate Scholarship Committee

Chair: Benoit Forget, MIT

Mark DeHart Idaho National Laboratory	Fausto Franceschini Westinghouse
Florent Heidet Argonne National Laboratory	

Treasurer's Report

By Anna Erickson

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Reactor Physics Division Treasurer, 2018-2019

The 2018 RPD financials were received from ANS in September 2018, providing the 2nd quarter financials of 2018. It is estimated that the RPD 2018 year-end fund balance will be $48,633. The balance includes the revenue from PHYSOR 2018 in the amount of $23,660, as well as a major one-time disbursement to Stamm'ler Scholarship in the amount of $20,000. The major RPD expenses in 2017 consisted of the following:

- Student support: $3,500 was given to the 2017 ANS Student Conference and $1,000 was given to the ANS Student Program for assistance to students to attend the 2017 ANS Annual and ANS Winter Meetings.
- Two scholarships were awarded in an amount of $6,000.
- ANS Young Professional Congress: $1,000 was given in support to the 2017 ANS Young Professional Congress organized as part of the 2017 ANS Winter Meeting.

A draft budget for 2018 was prepared and approved by the RPD Executive Committee. It forecasts that the Division will receive approximately $1800 from ANS national in the form of membership dues and will include $23,660 from the organization of the 2018 PHYSOR conference. The draft budget contains the following allocations:

- $2,500 in student support
- $6,000 for the RPD Scholarships
- $100 in plaques for award winners
- Stamm'ler Scholarship contribution in the amount of $20,000

RPD continues to have excellent financial health due to its membership and to the successful organization of the PHYSOR conferences.

Membership

By Anna Erickson

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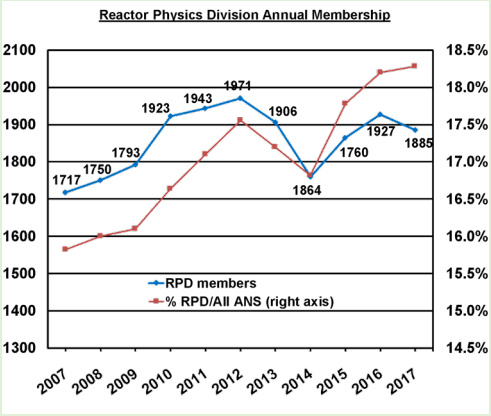
Numbers for the RPD membership are only provided once a year and are reported in the Spring newsletter. As a reminder from the last newsletter, the RPD membership has been decreasing in 2017 (see figure below), but overall there was a small relative increase within the ANS (18.3% of all ANS members are RPD).



American Nuclear Society Reactor Physics Division

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Reactor Physics Division Newsletter

Germina Ilas, RPD Secretary

RPD website: http://rpd.ans.org/