

# **ANS Reactor Physics Division**

A newsletter of the ANS Rector Physics Division

FALL ISSUE
October 2016

# Your RPD Leadership Team

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(Terms Expiring June 2017)

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# A Message from the Chair

By Fausto Franceschini francef@westinghouse.com

Dear RPD colleagues and friends,

This letter provides you an overview of the current status of the division, key activities and initiatives, including the highlights from our meetings and upcoming events.



Our division is doing well. We remain one of the largest ANS divisions with a very healthy budget that allows us to recognize and support students via a number of established scholarships. We continue to have a significant presence at our national meetings and organize outstanding topical meetings. This is thanks to your support and the dedication of the members of the Executive and Program Committee.

As the new RPD chair, I would like first of all to acknowledge the excellent work done by my predecessor, Pavel Tsvetkov. Pavel has been effectively engaged with RPD for a number of years, first as a reviewer, then as a member of the Technical Program and finally as an officer and chair of the Executive Committee. In all these roles Pavel has demonstrated outstanding expertise, dedication and leadership skills, providing a great service to our division and to the ANS.

I am proud and excited to be the chair of our division. I have always regarded reactor physics among the most fascinating disciplines underpinning nuclear energy generation. The fascination with reactor physics is indeed the primary reason I decided to pursue nuclear engineering as a student, and I have not been disappointed! Having been the chair of the Program Committee a few years ago, I can now close a circle that has given me plenty of rewards and opportunities. In fact, my involvement with RPD has been a career changing experience. Not only did it contribute to my technical growth but it profoundly enriched me as a person. I developed invaluable relationships and connections and I gave my contribution to the division. I am grateful to the many people that helped me in this endeavor, including my mentors, the reviewers, the members of the committees, and my company that has always

supported my participation to the ANS activities. I hope that my experience, which has been so deeply rewarding for me, can be of encouragement for you to become more involved with RPD. Please think how to make a difference, and act on it! Bring your passion and fresh ideas to the division. Help us recruit new members, build bridges with other divisions, organize relevant special sessions, review papers and contribute your state-of-the-art research to our meetings.

You are welcome to attend our division meetings to become more engaged and aware of the various aspects of the division, provide your perspective and foster the dialogue,

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develop a personal connection with the members of the committees. Our division meetings are always in the afternoon of the opening Sunday of every ANS meeting: look at the program for the details and the room.

These are exciting times for reactor physicists. A new generation of reactor physics tools pushing the envelope of reactor simulations is being developed and applied to a variety of groundbreaking applications, involving current and advanced reactors. There is intense research to develop and commercialize advanced "accident tolerant" fuels. As new builds are coming online, there is resurgent interest for advanced reactors of various types. Whether you are a developer, an analyst or a designer you have a role as reactor physicist, and our division will give you plenty of opportunity to be at the frontiers of these nuclear developments.

In closing, I would like to remind you to send your input for the ANS Nuclear Grand Challenges which will be used to identify the technical issues that need to be addressed to enhance the economic, political, and public acceptability of nuclear technologies. To present your ideas, you can either Log in to ANS Collaborate and send your suggestions to RPD, use the form in the Member

Center on <a href="www.ans.org">www.ans.org</a>, or simply send me an email: <a href="mailto:FranceF@westinghouse.com">FranceF@westinghouse.com</a>. Each Division will select one to three Division Grand Challenges for consideration to the ANS leadership. The final selection of the ANS Nuclear Grand Challenges will be announced at the ANS Annual Meeting on June 12, 2017.

See you in Las Vegas!

Fausto Franceschini, RPD Chair 2016/2017

## RPD Scholarships

By Benoit Forget

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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 (\$2,000), 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, 2017 and application forms can be found at:

http://www.ans.org/honors/scholarships/forms/

## 2016 ANS Annual Meeting – Executive Committee Meeting



# RPD Program Committee News

By Cristian Rabiti cristian.rabiti@inl.gov



## **New Members**

The RPD would like to welcome the new and renewed members of the Program Committee: Christophe Demaziere (Chalmers University of Technology), Matthew Anderson Jessee (ORNL), Carlo Parisi (INL), Wei Shen (Canadian Nuclear Safety Commission), Amanda L. Lang (Duke Energy), Hany Abdel-Khalik (Perdue University), Sunil S. Chirayath (Texas A&M University), Moussa Mahgerefeteh (Exelon).

New members are accepted at each Annual ANS meeting. The interest in becoming a member of the RPD Program Committee should be communicated to the Chair (Cristian Rabiti, <a href="mailto:cristian.rabiti@inl.gov">cristian.rabiti@inl.gov</a>) before the next Annual Meeting (June 11-15, 2017).

## 2016 ANS Winter Meeting, Las Vegas, NV

The venue of the current ANS winter Meeting is Las Vegas NV. A fairly large number of papers will be presented at the conference sponsored by the Reactor Physics division. 86 paper were presented over fourteen session: Reactor Physics: General (six sessions, total 37 papers), Reactor Analysis Methods (four sessions, total 22 papers), Fast Reactors (one sessions, total 8 papers), Reactor Physics Design, Validation and Operational Experience (two sessions, total 11 papers), and TREAT (one sessions, total 8 papers).

A special thanks to the organizers of the special sessions: "Fast Reactors," Florent Heidet and "TREAT," Javier Ortensi

## 2016 ANS Annual Meeting, New Orleans, LA

The venue of the last ANS 2016 Annual Meeting was New Orleans, LA. In spite of being very close to the PHYSOR 2016 conference 41 paper were presented over seven session: Reactor Physics: General (three session, 17 papers), Progress Status of Prototype Generation-IV Sodium-Cooled Fast Reactor (one session, 9 papers), Reactor Analysis Methods (two sessions, 11 papers), and Reactor Physics Design, Validation and Operational Experience (one session, 4 papers).

A special thanks to the organizer of the special session on "Progress Status of Prototype Generation-IV Sodium-Cooled Fast Reactor," Yoon I. Chang.

# RPD Best Paper Award (2016 ANS Annual Meeting)

As usual many excellent papers were submitted, and many excellent presentations were given at the 2015 ANS Annual Meeting. A team of peers reviewed both the papers and the presentations and determined that the paper/presentation: "A Space-Dependent Wielandt Shift for Multigroup Diffusion Eigenvalue Problems," by Ben C. Yee, Edward W. Larsen, Brendan M. Kochunas, Yunlin Xu (Univ of Michigan) published in Transactions of the American Nuclear Society, Vol. 114, New Orleans, Louisiana, June 12–16, 2016, was particularly good and deserving of this Reactor Physics Division award. Congratulations to the recipients!

## 2017 ANS Annual Meeting, San Francisco, CA

The organization of the 2017 ANS annual meeting is already ongoing. The extended abstract submission is open from October 1, 2016 to January 11, 2017. The committee would like to thanks the organizers for the five special sessions:

- · Research and Test Reactors (Florent Heidet)
- Recent Advancements in Liquid and Solid Fuel Molten Salt Reactors (Massimiliano Fratoni)
- Reactor Innovation Resurgence in 21st Century—Gen. IV Outdated or are we Circling Back to 1940s (Pavel Tsvetkov)
- DOE Nuclear Engineering University Program (NEUP) Sponsored Student Research (Todd S. Palmer)
- Load Follow, Nuclear Power Plants Flexible Power Operation (Moussa Mahgerefteh)

## Participation in Program Committee Activities

The Reactor Physics Program Committee, at the coming 2016 winter meeting, will be held Sunday, from 2pm to 4pm, in room OCTAVIUS 1 & 2 at the conference hotel. The meeting is open to anyone interested. It is also important to remind that the RPD Program Committee is the moment to present special session proposals for the next year winter meeting in Washington, DC (October 29-November 2, 2017). Please contact the Program Committee chair (Cristian Rabiti, <a href="mailto:cristian.rabiti@inl.gov">cristian.rabiti@inl.gov</a>) before or during the meeting to propose a special session.

## M&C 2017

The M&C 2017 meeting which is a sister meeting of PHYSOR will take place in Jeju, Korea, April 16-20, 2017. Jeju is a beautiful semi-tropical island providing relaxing and friendly environment. The meeting covers not only the traditional topics of reactor physics and particle transport, but also almost all the computational disciplines of nuclear engineering and science including computational thermal-hydraulics, computational material sciences, and multiphysics power reactor simulation. The number of extended summaries submitted is over 490 which is record high and the review is currently underway.

# ANS RPD Program Committee

## Chair

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# A Word from the Past Chair and Nominating Committee Chair

By Pavel Tsvetkov tsvetkov@tamu.edu

My dear RPD colleagues, friends,

The nominating committee is working on the upcoming ballot for the 2017 elections. Following our succession sequence, in



2017 elections. Following our succession sequence, in 2017, upon conclusion of 2017 summer meeting, Dr. Alpan will be stepping into her role as RPD Chair, Dr. Palmer will be assuming the role of Vice Chair, and Dr. Florent will become our division treasurer. Our division secretary position is an elected entry position to the succession. We have a number of candidates in the running for the secretary position. Terms of our four executive committee members will be expiring in 2017 and we have a list of candidates in the running for those four open positions. The ballots are being finalized.

Pavel Tsvetkov, RPD Past Chair

## **RPD** Website

#### By Arzu Alpan

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A new format for the RPD website has recently been implemented and the website is currently in development stage (http://rpd.ans.org/). We have sent emails to the RPD students and YMG members, seeking for a volunteer to help us in updating and maintaining the RPD website. Responses from the volunteers will be evaluated and the selected volunteer will be announced at the RPD meeting in November 2016. We look forward to working with our new volunteer who will focus on the RPD website!

Arzu Alpan, RPD Vice-chair

## **Honors and Awards**

### By Dimitros Cokinos

### cokinos@bnl.gov

Nominations are sought for the Eugene P. Wigner Reactor Physicist award. The deadline for the Wigner nominations is April 1, 2017.

As announced at the RPD Executive Committee in New Orleans, this year's Wigner award goes to two distinguished members of our division, Luiz Leal and Mark Williams, both of Oak Ridge National Laboratory. Luiz's accomplishments include extensive measurement programs of neutron cross sections, resonance data and enhancements in the theory of data evaluation. Mark's achievements in the field of reactor physics include innovative contributions to resonance self-shielding theory and development of continuous-energy deterministic transport calculations for lattice physics applications

In addition to the "Eugene P. Wigner Reactor Physicist Award" established in 1990, the Reactor Physics Division has recently created the "Early Career Reactor Physicist Award". This new award recognizes major technical accomplishments in the field of Reactor Physics by a person who, at the time of the nomination, is 39 years old or younger. Eligibility requirements and details on submitting a nomination package can be found at the ANS website under the heading of "Honors & Awards".

Members of the Reactor Physics Division may be eligible for a number of other ANS awards. A short list of such ANS awards is given below

- ANS Fellow Award
- · Landis Public Communications and Education Award
- Landis Young Member Engineering Achievement Award (age <40)</li>
- · Mishima Award for Scientific/Engineering achievement in Nuclear Fuels
- · Arthur Holly Compton Award in Education
- Reactor Technology Award: Recognition for advances in design and safety in reactor technology.

A more complete list of ANS awards and past winners can be found on the ANS website.

Dimitrios Cokinos, RPD Honors and Awards Committee Chair

# Reactor Physics Standards

#### **By Dimitros Cokinos**

### cokinos@bnl.gov

Activities are currently focused on the revision of standards and transfer of our ANSI/ANS standards into international standards.

#### Revisions:

- Revision of ANSI/ANS-19.4, "A Guide for Acquisition and Documentation of Reference Power Reactor Physics Measurements for Nuclear Analysis Verification" has continued. This standard provides guidance and criteria for identifying and selecting quality measured data to be used in the validation and verification of computer codes. It is now in the process of being reviewed internally by the members of the ANS-19.4 Working Group. The standard serves an important purpose as it provides the principal means through which modern computer codes are being benchmarked.
- Standard ANSI/ANS-19.11, "Calculation and Measurement of the Moderator Temperature Coefficient for Pressurized Water Reactors" has been reviewed by the members of ANS-19 and approved. It is now on its way to review and approval by the Consensus Committee.
- The newly revised and significantly improved Standard ANSI/ANS-5.1,
   "Decay Heat Power in Light Water Reactors" continues to enjoy
   widespread use both here and abroad. This standard was the subject of a
   lengthy article in the "ANS Standard News" publication by its Working
   Group Chair, Ian Gauld.

### **International Standards:**

 ANS-19, the Reactor Physics Standards, whose primary goal is to develop and maintain (keeping alive) standards for reactor design, is the source for the transfer of certain of its ANSI/ANS standards to the International Organisation for Standardization (ISO). A number of ANSI/ANS-19 standards have been earmarked and approved for the conversion into ISO standards.

Dimitrios Cokinos, RPD Honors and Awards Committee Chair

## Membership

### By Todd Palmer

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The RPD membership from 2005 through December 31, 2015 is given in Figure 1. The RPD membership shows an increase annually from 2005 through 2012, a slight decrease of 3% in 2013, and a larger decrease of 8% in 2014. The decrease in the RPD membership in 2013 and 2014 is mainly attributed to the decrease in the overall ANS membership. Note that even though the number of ANS members in 2014 and 2015 is comparable, the RPD membership increased 6% in 2015, compared to 2014. As of October 25, 2016 the Reactor Physics Division is counting 1581 members. With the increase of membership occurring in the last months of each year, we are on track to achieve a similar membership level as in 2015. Figure 2 gives the current RPD 2016 membership allocation by industry; the majority of our members are students (24%), followed by members from educational institutions (21%).

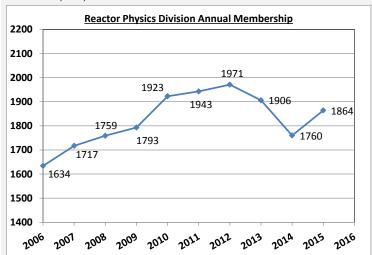


Figure 1. The RPD Annual Membership

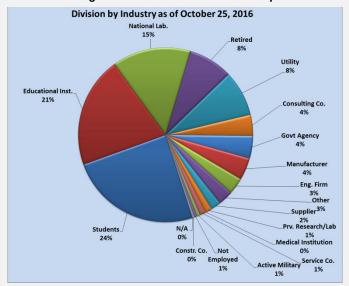


Figure 2. The RPD 2016 Membership Allocation by Industry

## Treasurer's Report

By Todd Palmer, RPD Treasurer 2016-2017

palmerts@ne.orst.edu

The latest RPD financials were received from ANS in August 2016, providing the 2nd quarter financials of 2016. Based on the 2nd quarter financials of 2016 and the anticipated expenses in the remainder of 2016, it is estimated that the RPD 2016 year-end fund balance will be \$58,933.

The major RPD expenses in 2016 consisted of the student support (\$2,500 was given to the 2016 ANS Student Conference and \$1,000 was given to the ANS Student Program for assistance to students to attend the 2016 ANS Annual and 2016 ANS Winter Meetings), the Lineberry Scholarship (a contribution of \$5,000 and \$6,500 was provided in 2015 and 2016, respectively), and the Rudi Stamm'ler Reactor Physics Division Scholarship (\$6,000 was contributed in 2016; the balance in the Stamm'ler fund is about \$33,000).

The final revenue figures from the PHYSOR 2016 meeting are available. RPD received \$35,061 from PHYSOR 2016. In addition, we forecast that the Division will receive approximately \$3500 from ANS national in the form of membership dues. RPD continues to have excellent financial health.

A draft budget for 2017 was submitted to ANS National, and it contains allocations of \$3,500 in student support, \$6000 for the Stamm'er RPD Scholarship, \$130 in plaques for award winners, and \$1000 for website/newsletter expenses.

As 2017 is an "in-between" year for RPD topical meetings, we project only income from membership allocation (\$3500).

# **Upcoming Topical Meetings**

M&C 2017 – International Conference on Mathematics & Computational Methods Applied to Nuclear Science & Engineering

April 16-20, 2017, Jeju, Korea

http://www.mc2017.org



16<sup>th</sup> ISRD – Sixteenth International Symposium on Reactor Dosimetry

May 7-12, 2017, Santa Fe, New Mexico

http://isrd16.reactordosimetry.org



PHYSOR 2018 - International Topical Meeting on Advances in Reactor Physics

Cancun, Mexico, 2018



October, 2016 Reactor Physics Division Newsletter

Florent Heidet, RPD Secretary

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