

American Nuclear Society

# Reactor Physics Division

## Fall 2020 Newsletter

### Officers

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Amanda.Lang – Vice-Chair  
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Matt Jessee – Treasurer  
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Chris Perfetti – Secretary  
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Todd Palmer – Past Chair  
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### PHYSOR 2022 News



Join us for PHYSOR 2022  
in Pittsburgh, Pennsylvania!

For more information visit  
us at:

[https://www.ans.org/  
meetings/physor2022/](https://www.ans.org/meetings/physor2022/)

### A Message from the Chair

Florent Heidet  
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Fellow RPD members,

As we are approaching the end of the year, this gives us an opportunity to reflect back on achievements and challenges in our field over the past 12 months. With the world-wide pandemic situation still very much active and affecting our lives, this forced us to change our habits and how to continue moving our field forward. Despite all of it, innovation and progresses in nuclear energy continued, new initiatives flourished and many milestones achieved. This creates a very empowering and exciting environment with many things to look forward to. Reactor physics is at the heart of it all, with so many on-going design efforts relative to all types of reactor technologies, as well as applying new methods and modeling and simulation tools developed over the years to practical reactors.

For matters relative to our Reactor Physics Division, you will find more details throughout this newsletter. In case you are surprised with the current state of the RPD governance, we had to make some unique exceptions to our typical transition plan as some of last year's officers becoming unable to serve. As such, we elected two new officers in the position of Treasurer (Matt Jesse) and Secretary (Chris Perfetti), and our previous secretary was elected to the position of Vice-Chair (Amanda Lang). To ensure continuity, I agree to serve a second year as chair of the division. Please join me in welcoming our new and returning officers!

Overall, our division is very healthy and continues on the trends set for the many years prior. While we all continue our efforts to grow our field and push the envelope, we need to pay close attention to the pipeline feeding experts into our field, the academia. We should take every possible opportunity to create ties with our universities and their professors, but mostly with the students. Please remember that RPD is offering several scholarships and encourage interested students to apply.

On this note, I would like to wish all of you and your relatives Happy Holidays!

Florent Heidet, RPD Chair

## Executive Committee

### (Terms Expiring June 2021)

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## Newsletter Prepared By:

Chris Perfetti  
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RPD Secretary



**RPD Secretary Chris Perfetti as he is swarmed by vicious Chihuahuas.**

*Chris is an Assistant Professor at the University of New Mexico whose research interests include sensitivity and uncertainty analysis methods, Monte Carlo methods, reactor physics, criticality safety, radiation transport and shielding, and isotope production. In his spare time he enjoys hiking, cycling, swing dancing, brewing beer, and puns.*

## In Memoriam: Alan Robinson

Todd Palmer  
palmerts@ne.orst.edu

I began my undergraduate studies in Nuclear Engineering at Oregon State in 1983, and I was fortunate to have Alan as my academic advisor. He was very familiar with the curriculum, kept excellent records, and took a personal interest in my progress as a student. He would tell me stories of his consulting work in Richland, WA and he shared his passion for racing cars. As a teacher, he taught me nuclear reactor physics. He was very comfortable with the practical, applied aspects of the subject and could talk very knowledgeably about what was going on in the industry. He was also exceptional with numerical methods, applied mathematics and computational science, and it was this combination of subjects that convinced me that I absolutely needed to continue on for a graduate degree. My buddy, Todd Wareing, and I headed off to the University of Michigan where we both earned MS and PhD degrees focused on computational methods for radiation transport. Alan was instrumental in our success. He had high expectations, worked hard as an educator, and was a strong believer in experiential learning. I enjoyed my time



**Alan and Kay Robinson**

as a student at Oregon State so much that, during my last summer as an undergraduate, I mentioned to Dana Cramer (Alan's administrative assistant) and Alan that I wanted to come back and be a Professor at OSU. Of course I didn't really know what I was going to do, but when Alan hired me on the faculty in 1995 after a few years working at Lawrence Livermore National Laboratory, I was excited and proud. One of the first classes I taught was one that Alan taught to me. For years after Alan retired, he would give me a call or stop by to talk technical – he loved computers and software, and he would continue to teach himself new skills and learn new tools. I always felt that he took a special interest in me, and I'll be forever grateful that he took a chance on me 25 years ago. I have many fond memories of Alan, and I will miss him.

## Honors & Awards

Dimitrios Cokinos  
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RPD Honors & Awards Comm. Chair

### EUGENE P. WIGNER REACTOR PHYSICIST AWARD

RPD members are invited to submit nominations for the Eugene P. Wigner Reactor Physicist Award. The deadline for nominations

is April 1, 2021. Nomination forms are available at the ANS headquarters.

### EARLY CAREER REACTOR PHYSICIST AWARD

This relatively new RPD award is intended to honor the contributions of reactor physicists who at the time of nomination are thirty-nine years of age or younger. Nomination forms may be obtained from the ANS headquarters. The deadline for nominations is August 1, 2021.

## Scholarships

Benoit Forget  
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RPD Scholarships Chair

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, 2021 and application forms can be found at <https://www.ans.org/scholarships/>.

## In Memoriam: Massimo Salvatores

Giuseppe Palmiotti

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Edited by Laura Ingersol

Massimo (Max) Salvatores, one of the most recognizable names in reactor physics, and my thesis supervisor, mentor, manager, distinguished colleague, friend, and the man who was like a brother to me, passed away recently.

Born in Turin, Italy on March 31, 1941, Massimo graduated magna cum laude with his doctorate in theoretical physics at the University of Turin in 1963. His exceptional career began at the Italian Nuclear Research Agency (ENEA, formerly CNEN), where he directed the Italian analysis of critical experiments, including those involving the Zero Power Plutonium Reactor (ZPPR) at Argonne National Laboratory (ANL), TAPIRO shielding experiments at Casaccia, and PECORE at the MASURCA Facility in France. During this period from 1964 to 1977, he contributed to the analysis and design of experiments as a visiting scientist at ANL, was assigned as an International Atomic Energy Agency (IAEA) expert to the Institute for Nuclear Technology in Bucharest, Romania, was a visiting professor at the Georgia Institute of Technology, and contributed to research on perturbation/sensitivity theory, shielding experiments, and reactor innovations as a Project Leader at Oak Ridge National Laboratory (ORNL).

From 1977 to his retirement in 2001, he worked at the French Nuclear Energy Agency (CEA) in the Cadarache Research Center. He directed experimental planning and analysis of the Shielding Fast Reactor Group, which developed the SUPER-PHENIX shielding design, and worked on the RACINE project for the simulation of fast reactor heterogeneous cores. He also worked on developing methods to validate nuclear data, and compute higher-order and time-dependent sensitivity coefficients. Following his appointment as head of the CEA/Cadarache Physics Studies Laboratory (LEPh) in 1983, he became the leader of European research on advanced reactor physics. In 1989, he was appointed as the head of the Reactor and Fuel Cycle Physics Service, which led theoretical and experimental research in thermal and fast reactor physics and fuel cycle studies. He also worked on developing simulations for large-size fast reactor cores, Mixed Oxide (MOX) thermal reactor cores,



**Massimo Salvatores receives the Eugene P. Wigner Reactor Physicist Award (with Jack Ohanian, 2005; courtesy of the American Nuclear Society).**

and the European Reactor ANALysis Optimized code System (ERANOS) for fast reactors, which is still in use today.

He became research director at the CEA in 1992. Among his many accomplishments during that time period, he helped develop the theoretical principles of the Accelerator Driven System (ADS), and developed the first international neutronics experiment for the validation of ADS at the Cadarache MASURCA facility. In 1995, he was appointed to the Scientific Advisory Board of the Energy Department of the Paul Scherrer Institute (PSI) in Switzerland. In 1996, he was appointed co-director of the GEDEON Research Project, which sought new methods for management of nuclear waste. He was appointed a Member of the Scientific Advisory Board of the Institute for Reference Materials and Measurements (IRMM) in Geel, Belgium. In 1998, he joined the Scientific Council of CEA.

Retirement was just a pleonastic word for Massimo; his accomplishments following his official retirement from CEA include serving as: a visiting scientist at ANL (2001-2002), a project leader of MEGAPIE (1999-2003), scientific advisor to the director of CEA Nuclear Energy (2001-2014), a scientific advisor at ANL (2002-2009), a scientific advisor for the NUKLEAR program at the Karlsruhe Institute of Technology (2002-2013), a scientific advisor at Idaho National Laboratory (IRL) (2006-2019). His lifetime of achievements in the field of reactor physics has inspired a new generation of scientists and has furthered the development of sensitivity, uncertainty quantification, and cross-section adjustment methods for the validation of nuclear data.

## Treasurer's Report

Matthew Jessee

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RPD Treasurer

The 2020 RPD financials were received from ANS in October 2020, providing the status as of the end of the 3rd quarter of 2020. It is estimated that the RPD 2020 year-end fund balance will be \$40,742. The major RPD expenses in 2020 con-

sisted of the following:

**Student support:** \$2,500 was given to the 2020 ANS Student Conference.

**Awards:** \$60 for awards/plaques. A draft budget for 2021 was prepared. It forecasts that the Division will receive approximately \$2,600 from ANS national in the form of membership dues. The 2021 draft budget contains a \$2,500 allocation for student support.

The RPD financial health will not be possible without your contributions. Please take a few minutes to renew your membership by the end of this calendar year.

*Matthew Jessee is a senior R&D staff in the Nuclear Energy and Fuel Cycles Division at ORNL. He loves running and spending time with his family. He aspires to run a full-marathon in 2020 for his 40th birthday.*

## Reactor Physics Standards

Dimitrios Cokinos  
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RPD Standards Committee Chair

The Standards Subcommittee (ANS-19) has been meeting regularly during national meetings while Working Groups (WGs) have been holding separate meetings in-between Subcommittee meetings. Below is a summary of the status of each ANS-19 project:

### ANS-19.1, Nuclear Data Sets for Reactor Design Calculations

Standard recently revised, published and is available for purchase as ANSI/ANS-19.1 (2020).

### ANS-19.3, Steady State Neutronic Methods for Power Reactor Analysis

The WG has just completed its revision and the revised draft is now being circulated.

### ANS-19.3.4, Thermal Energy Deposition Rates in Nuclear Reactors

This standard involves a complex set of atomic physics, nuclear physics and reactor physics calculations. The revision has been completed and the revised draft is now undergoing a review by the WG.

### ANS-19.6.1, Reload Startup Physics Tests for PWRs

Updated version moving through the Consensus Committee and ANS Stan-

dard Board for final approval.

### ANS-19.10, Methods for Determining Neutron Fluence in BWR and PWR Pressure Vessel and Reactor Internals

This standard was reaffirmed in October 2016. The revision is underway and the next action is now due by October 2021.

### ANS-19.11, Calculation and Measurement of the Moderator Temperature Coefficient of Reactivity for Pressurized Water Reactors

Revised 2017 and due for action in 2022.

### ANS-5.1, Decay Heat Power in Light Water Reactors

An extended revision has been complet-

## Program Chair's Report

Pavel Tsvetkov  
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RPD Program Chair

Due to challenges imposed by the global pandemics, the ANS Winter 2020 meeting was organized and held as a virtual meeting. This meeting built on the success of the 1st ever virtual ANS 2020 Annual meeting. The Reactor Physics Division maintained significant presence at the meeting with 47 papers in 12 standing and special sponsored and co-sponsored sessions. There are sessions on advancements in reactor physics methods, reactor design innovation, emerging advanced reactors for terrestri-

al and space applications. In particular, we like to recognize high-impact efforts reported in special sessions on advancements towards Versatile Test Reactor, Transformational Challenge Reactor, and Molten Salt Reactors.

The ANS 2021 Annual Meeting Call for Papers seeks contributions for 16 panels and technical sessions. In addition to regular standing sessions, the meeting program will feature Micro Reactors for Terrestrial and Space Applications, the Versatile Test Reactor, the Transformational Challenge Reactor, Machine Learning in reactor physics and design and enabling technologies for Molten Salt Reactors.

On November 20, the Program Committee met in a virtual session to discuss contemporary programmatic issues and action items. One of the topics on the agenda was the status of PHYSOR 2022. The organizing team reported the meeting organization is progressing on schedule:

- TPC and Co-Chairs (A. Godfrey, P. Blaise, D. Lee) met to discuss the draft technical program, updated and assigned track leaders.
- WEC and Exelon kicked off conference organization to discuss overall conference management, ANS/WECr roles & responsibilities, draft technical program, and the next steps.
- The proposal and publication plan has been communicated to the ANS.

## RPD Program Committee

### 2017 – 2020

- Cristian Rabiti
- Florent Heidet
- Alberto Talamo
- Blair P. Bromley
- Won Sik Yang
- Nicolas Stauff
- Manuele Aufiero

### 2018 – 2021

- Andrea Alfonsi
- Liangzhi Cao
- Brandon Haugh
- Dan Kotlyar
- Alex Levinsky
- Ben Betzler
- Benjamin S Collins
- Abdalla Abou Jaoude
- Vefa Kucukboyaci
- Zeyun Wu

### 2019 – 2022

- Scott Palmtag
- Massimiliano Fratoni
- Yunlin Xu
- Paolo Balestra