



Cascade Chapter



Avalanche

The official newsletter of the
Cascade Chapter of the Health Physics Society

Spring 2016 Issue

<http://www.hpschapters.org/cascade/>

President's Corner

Hello, the holidays are over and as spring has come in with a bang it is time to once again start thinking about our chapter. I think we can all agree that we would like the CCHPS to be active and healthy. It is the time to elect a new President-Elect and Secretary. If you didn't get the opportunity to vote please contact us at cascadechapterhps@gmail.com and we will send you the link. Please join us at the spring meeting in Corvallis on May 13 to hear the results of the elections.

At the last meeting we decided to add an additional meeting in the Winter. The concept was to expose the members of our community to things outside their normal day to day health physics duties. On March 22nd the chapter was able to offer members a tour of a ballistic missile submarine at Naval Base Kitsap. We had 30 members join us for a day of fun onboard USS Nevada SSBN 733. Members got the opportunity to tour all non-radiation areas of the submarine from control, torpedo room, the missile compartment, and back to the engine room. We learned about navigation, submarine movement, shooting torpedoes, and ballistic missiles, and even how the atmosphere is maintained while submerged. It was a great time and our hosts were especially generous with their knowledge and time

If you would be interested in hosting one of these events please let us know and we can make arrangements.

Following the coming Dale E. Trout Meeting, I will be assuming the role of Past-President, and Mike Zittle from University of Washington will become Chapter President. I hope to see you at our next meeting in Corvallis on May 13th, but in case I don't get a chance to talk to you I hope your plants and gardens produce abundantly.

-Jessie Puryear

2016 Spring Meeting

Hello CCHPS Members! The Spring 2016 meeting is just around the corner, and will be held in Corvallis Oregon, at the "Vue" (same location as last year). Our

long time sponsors, Clyde Makinson of Seltech and Nelson Chiu of Mirion along with a new vendor, Lab Logic, will be providing breakfast and the afternoon snack for the meeting. This year is a little different in that we will have a cash bar available at the end of the meeting along with some live music. So don't run off when the meeting ends!

Presentations

The spring meeting is typically an opportunity for the OSU graduate students to present their work in addition to presentations from our peers. This meeting we have several student speakers, Mr. Bob Cherry (President-Elect Health Physics Society), and Mike Zittle. In addition, Art Johnson will give a brief overview of the work Dale Trout did at OSU and how his legacy lives on with CCHPS.

Presentation topics include;

The International Monitoring System (IMS) which is a worldwide network of observational technology was established to detect and confirm violations of the CTBT. IMS has the advantage of using four state-of-the-art technologies to monitor nuclear explosions globally. Infrasound, hydroacoustics, forensic seismology and radionuclide monitoring are among these technologies. However, these technologies are not completely effective without the inclusion of radionuclide monitoring. This method is the only method that can provide proof that any detected explosion was a nuclear detonation. In this presentation these four verification tools will be introduced and discussed in more detail.

The Comprehensive Nuclear-Test-Ban Treaty (CTBT) is a multilateral treaty that bans all civilian and military nuclear explosions in all environments: under water, underground, on the earth's surface and in the atmosphere. It bans nuclear explosions by everyone; therefore countries with nuclear bombs in their hand cannot make more powerful bombs, while it makes it very difficult for countries without any nuclear bomb to develop one.

Introduction of Integrated Stochastic Spatial Temporal (ISST) Model in Radiation Biology Simulation.

Due to the quantum characteristics of radiation, radiation biology was mainly studied by physicists since it was created. Radiation damage to a biological system is a complicated multiscale problem in spatial and temporal perspective. Mathematical modeling substantially helps people to understand the radiation damage process in biological systems. In this work an integrated spatial and temporal stochastic model was proposed to study the radiation effect on biological cells. The model could be used to create computerized cell, to simulate the radiation transportation process in computerized cell, to quantify the DNA damage production in computerized cell, to quantify the cell state evolution dynamics, and to quantify the biological effect of computerized cell. The model was implemented based on multi-platform simulation. The Geant4 was used to study the radiation transportation process, and CompuCell3D was used to study the cell morphological dynamics and cell mitosis process.

Steady State Modeling of the Minimum Critical Core of the Transient Reactor Test Facility.

With the advent of next generation reactor systems and new fuel designs, the U.S. Department of Energy (DOE) has identified the need for the resumption of transient testing of nuclear fuels. The DOE has decided that the Transient Reactor Test Facility (TREAT) at Idaho National Laboratory (INL) is best suited for future testing. TREAT is a thermal neutron spectrum, air-cooled, nuclear test facility that is designed to test nuclear fuels in transient scenarios. These specific scenarios range from simple temperature transients to full fuel melt accidents.

DOE has expressed a desire to develop a simulation capability that will accurately model the experiments before they are irradiated at the facility. It is the aim for this capability to have an emphasis on effective and safe operation while minimizing experimental time and cost. The multiphysics platform MOOSE has been selected as the framework for this project.

The goals for this work are to identify the fundamental neutronics properties of TREAT and to develop an accurate steady state model for future multiphysics transient simulations. In order to minimize computational cost, the effect of spatial homogenization and angular discretization are investigated. It was found that significant anisotropy is present in TREAT assemblies and to capture this effect, explicit modeling of cooling channels and inter-element gaps is necessary. For this modeling scheme, single element calculations at 293 K gave power distributions with a root mean square difference of 0.076% from those of reference SERPENT calculations. The minimum critical core configuration

with identical gap and channel treatment at 293 K resulted in a root mean square, total core, radial power distribution 2.423% different than those of reference SERPENT solutions.

Time, distance, and shielding are mantras in the field of radiation protection. However, they don't tell a worker what to do. *Beyond Time Distance and Shielding* is based upon the 10 Principles and Commandments of Radiation Protection as published by Dan Strom in the Health Physics Journal in 1996. The 10 Commandments transcends the easily remembered "List of 3" in that it addresses other risk-limiting and protective measures such as performance standards, health education, engineering requirements and administrative procedures. This presentation was originally designed for refresher training for industrial radiographers, but it can be applied to any radiation protection situation with a bit of creativity.

Licensing Legacy Depleted Uranium on Army Ranges.

The Army developed the M28 Davy Crockett nuclear weapon system in the late 1950s for use against Soviet armor and troops if war broke out in Europe. It was deployed from 1962 to 1968 and included the M101 spotting round, which included depleted uranium. The Atomic Energy Commission issued a license to the Army that allowed the Army to fire the M101 during training. The license did not require the Army to recover the expended M101 rounds from its ranges. In 2005, during construction on a training range in Hawaii, an Army contractor found M101 debris. The Army reported this to the Nuclear Regulatory Commission in 2006, at which time the NRC required the Army to apply for a license to possess this DU on its Hawaii ranges and on ranges at fifteen other Army installations. This presentation will discuss the Davy Crockett weapon system and the M101 licensing history.

Meeting Details

The 2016 Spring CCHPS Meeting will be held Friday May 13, 2016 at the Vue, in Corvallis Oregon. 517 SW 2nd Street Corvallis, Oregon 97330 541-740-2340. www.vuecorvallis.com

Registration

Register for the meeting by sending an e-mail message to: cascadechapterhps@gmail.com. Please e-mail your registration by April 22. Also remember to indicate whether you will have a guest in attendance. You may also pay your CCHPS dues at the meeting, please refer to the dues section for prices.

Agenda

9:00-10:00	Registration and Breakfast
9:30-10:00	Executive Council Business Meeting
10:00-10:15	Chapter Business Meeting
10:15-10:30	Dale E. Trout and his X-Ray Lab at OSU <i>Art Johnson, OSU Alum</i>
10:30-11:15	Presentation - "The International Monitoring System in Support of the Comprehensive Nuclear Test Ban Treaty" <i>Lily Ranjbar, PhD Candidate OSU</i>
11:20-12:05	Presentation - "Introduction of Integrated Stochastic Spatial Temporal (ISST) Model in Radiation Biology Simulation" <i>Ruirui Liu, Graduate student OSU</i>
12:05-12:50	Lunch
12:50-1:35	Presentation - "Steady State Modeling of the Minimum Critical Core of the Transient Reactor Test Facility" <i>Tony Alberti, PhD Candidate OSU</i>
1:35-1:50	Afternoon Break
1:50-2:35	Presentation - "Radiation Protection: Beyond Time, Distance, and Shielding." <i>Mike Zittle, Univ of Washington</i>
2:35-3:15	Presentation - "Licensing Legacy Depleted Uranium on Army Ranges" <i>Bob Cherry, HPS President-Elect</i>
3:15	Adjourn

Menu

Breakfast

Fresh Orange Juice, Coffee, Decaf, and Hot Tea Service, Seasonal Fresh Cut Fruit Platter, and an Assortment of Breakfast Pastries with Butter, Marmalade, & Berry Preserves.

Lunch

Mediterranean Café – Build Your Own Greek-inspired Pita. Grilled Chicken Breast, Vegetarian Option, Greek Herb Meatballs, Garlic Hummus, Olives, Crumbled Feta, Chopped Romaine, Tomatoes, Cucumbers Balsamic Vinegar, Tzatziki Sauce, and Signature Soup.

The Lunch Entrée is served with Pita Pockets and Grilled Flatbread, along with Ice Water, Iced Tea, and Lemonade.

Afternoon Break

Sweet Treat Trio and Assorted Cold Beverages.

Happy Hour

Artisan Cheese and Crackers, Cash Bar with Beer and Wine

Prices for the meeting are:

	Meeting Only	Lunch & Meeting
Member	\$25	\$30
Non-member	\$35	\$40

Parking

Parking is available adjacent to the building and on the street.

Directions to the Meeting

- Driving South 1. Traveling on I-5 S entering Oregon
2. Keep left at the fork to stay on I-5 S
3. Keep right at the fork to stay on I-5 S, follow signs for Interstate 5 S/Salem for 71.9 mi
4. Take exit 228 for Oregon 34 toward Lebanon/Corvallis
5. Turn right onto OR-34 W
6. Turn left onto NW 2nd St
Destination will be on the left

<https://goo.gl/maps/dzak6dKQ6bG2>

Chapter News and Announcements

2016 Chapter Dues

We will be accepting payment of chapter dues for 2016. Dues for 2016 remain the same as last year: \$25 for Plenary membership, \$20 per person for Group membership, and \$12.50 for Student and Member Emeritus membership. You can pay your dues together with your meeting registration at the May 13th chapter meeting, or mail a check payable to CCHPS to the chapter secretary at the address shown below. More information about the different membership categories and the benefits of each type of membership can be found on the [CCHPS website](#).
