



HEALTH PHYSICS SOCIETY

67th Annual Meeting

Spokane Convention Center
Spokane, WA • 17-21 July 2022

CONFERENCE PROGRAM





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HEALTH PHYSICS SOCIETY

Spokane Convention Center • Spokane, WA • 17-21 July 2022

Registration Hours and Location

Exhibit Hall A, Spokane Convention Center

Sunday, 17 July

1:30 PM – 4:00 PM

Monday, 18 July

7:30 AM – 4:00 PM

Tuesday, 19 July

8:00 AM – 4:00 PM

Wednesday, 20 July

8:00 AM – 4:00 PM

Thursday, 21 July

8:00 AM – 11:00 AM

Exhibit Hours and Location

Exhibit Hall A, Spokane Convention Center

Monday, 18 July

12:00 PM – 7:00 PM

Tuesday, 19 July

9:30 AM – 5:00 PM

Wednesday, 20 July

9:30 AM – 12:00 PM

Spokane Convention Center

334 West Spokane Falls Blvd.

Spokane, WA 99201

509.279.7000

www.spokanecenter.com

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SCHEDULE AT-A-GLANCE

All events at the Spokane Convention Center unless otherwise noted.

Saturday, 16 July

Student Orientation

5:00 PM – 6:00 PM Davenport, Meeting Room 3

Sunday, 17 July

All PEP Courses take place at the Spokane Convention Center

PEP 1-A thru 1-C

8:00am – 10:00am PDT

PEP 2-A thru 2-C

10:30am – 12:30pm PDT

PEP 3-A thru 3-C

1:30pm – 3:30pm PDT

PEP 4-A thru 4-C

3:30pm – 5:30pm PDT

Quiz Bowl

5:00 PM – 6:30 PM Room 206 C

Student Speed Networking

3:30 PM – 5:00 PM Room 206 B

Sunday PEP Locations

PEP A = Room 201 AB
PEP B = Room 201 C
PEP C = Room 202 AB

KEY

MAM = Monday AM Session
MPM = Monday PM Session
TAM = Tuesday AM Session
TPM = Tuesday PM Session
WAM = Wed. AM Session
WPM = Wed. PM Session
THAM = Thurs. AM Session
THPM = Thurs. PM Session

Monday, 18 July

CEL-1 How to Remove and Replace your Cesium Irradiator
6:45 AM – 7:45 AM Centennial Ballroom B

MAM-A HPS Government Relations Program
9:30 AM – 11:15 AM Centennial Ballroom 300A

MAM-B Special Session: Data Quality
9:30 AM – 11:30 AM Centennial Ballroom 300B

MAM-C External Dosimetry
9:30 AM – 11:30 AM Centennial Ballroom 300C

MAM-D Power Reactor
9:30 AM – 11:15 AM Centennial Ballroom 300D

Exhibitor Sponsored Lunch
12:00 PM – 1:30 PM Exhibit Hall A

PEP Program 12:15 PM – 2:15 PM

M-1 Centennial Ballroom A
ICRU 95: Operational Quantities for External Radiation Exposure

M-2 Centennial Ballroom B
Laser Safety the Next Level

M-3 Centennial Ballroom C
Integration of Health Physics into Emergency Response and Information Communication

M-4 Centennial Ballroom D
Internal Dose Calculations for Nuclear Medicine Applications

MPM-A Special Session: Magnetic Field Effects & Safety for Health Physicists
2:30 PM – 5:50 PM Centennial Ballroom 300A

MPM-B Accelerator
2:30 PM – 5:55 PM Centennial Ballroom 300B

MPM-C Academic Health Physics
2:30 PM – 4:45 PM Centennial Ballroom 300C

MPM-D Risk Assessment
2:30 PM – 4:15 PM Centennial Ballroom 300D

Poster Session
6:00 PM – 7:00 PM Exhibit Hall A

Welcome Reception
5:30 PM – 7:00 PM Exhibit Hall A

Tuesday, 19 July

CEL-2 Radiation Protection of the Public and the Environment
6:45 AM – 7:45 AM Centennial Ballroom B

TAM-A1 Dose Reconstruction
9:30 AM – 10:30 AM Centennial Ballroom 300A

TAM-A2 Radiobiology and Biological Response
10:45 AM – 11:45 AM Centennial Ballroom 300A

TAM-B Emergency Response
9:30 AM – 11:45 AM Centennial Ballroom 300B

TAM-C Topics in Health Physics
9:30 AM – 11:00 AM Centennial Ballroom 300C

TAM-D Special Session: Use of Drones to Enhance Surveys
9:30 AM – 11:30 AM Centennial Ballroom 300D

TAM-E Special Session: Rad Air NESHAPs
9:30 AM – 11:00 AM Room 302AB

Exhibitor Sponsored Lunch
12:00 PM – 1:30 PM Exhibit Hall A

PEP Program 12:15 PM – 2:15 PM

T-1 Centennial Ballroom D
The Case Against The LNT

T-2 Room 302 AB
Performing ANSI Z136-Based Laser Hazard Calculations

T-3 Room 402 C
Design, Licensing and Commissioning of a New Nuclear Medicine Accelerator Facility

TPM-A AAHP Special Session: The System of Radiological Protection, Part 1
1:30 PM – 6:30 PM Centennial Ballroom 300A

TPM-B Special Session: Remediation of Contaminated Sites
1:30 PM – 5:30 PM Centennial Ballroom 300B

TPM-C Special Session: Challenges, Barriers, and Successes in an HP Career - From STEM to Retirement
1:30 PM – 5:30 PM Centennial Ballroom 300C

TPM-D Internal Dosimetry
2:30 PM – 5:30 PM Centennial Ballroom 300D

TPM-E Health Physics Instrumentation
2:30 PM – 5:30 PM Room 302AB

SCHEDULE AT-A-GLANCE

All events at the Spokane Convention Center unless otherwise noted.

Wednesday, 20 July	Thursday, 21 July	Registration Hours
<p>CEL-3 Establishing a Program to Produce Ac-225 with a Superconducting Linear Accelerator: Lessons Learned 6:45 AM – 7:45 AM Centennial Ballroom B</p> <hr/> <p>WAM-A Medical Health Physics 9:30 AM – 11:15 AM Centennial Ballroom 300A</p> <p>WAM-B Special Session: DOE Health Studies Part 1 9:30 AM – 12:00 PM Centennial Ballroom 300B</p> <p>WAM-C Special Session: The HPS Standards Organization 9:30 AM – 11:50 AM Centennial Ballroom 300C</p> <p>WAM-D Decontamination and Decommissioning 9:30 AM – 11:45 AM Centennial Ballroom 300D</p> <hr/> <p>HPS Awards Lunch 12:00 PM – 2:30 PM Exhibit Hall B</p> <hr/> <p>WPM-A AAHP Special Session: The System of Radiological Protection, Part 2 2:30 PM – 5:30 PM Centennial Ballroom 300A</p> <p>WPM-B Special Session: DOE Health Studies Part 2 2:30 PM – 5:45 PM Centennial Ballroom 300B</p> <p>WPM-C Environmental Monitoring 2:30 PM – 5:00 PM Centennial Ballroom 300C</p> <p>WPM-D Special Session: Health Physics Evolution in Medical Physics Enterprise 2:30 PM – 3:30 PM Centennial Ballroom 300D</p>	<p>CEL-4 Managing Generally Licensed Devices 6:45 AM – 7:45 AM Centennial Ballroom B</p> <hr/> <p>THAM-A Special Session: Workings of the Health Physics Society - A “How to” Training Session 8:00 AM – 12:00 PM Centennial Ballroom 300A</p> <p>THAM-B Special Session: AIRRS Roundtable 8:00 AM – 12:00 PM Centennial Ballroom 300B</p> <p>THAM-C International Collaboration Committee Special Session: How to Influence the Future of Radiological Protection 8:00 AM – 11:30 AM Centennial Ballroom 300C</p> <hr/> <p>PEP Program 12:15 PM – 2:15 PM Room 302 A</p> <p>TH-1 Radiation in Flight Room 302 B</p> <p>TH-2 Radon physics Room 302 B</p> <p>TH-3 Technical Basis and Operational Experience for Clearance of Personal Property from SLAC Accelerator Facilities Room 402 C</p> <hr/> <p>THPM-A Special Session: Non-ionizing Radiation 1:30 PM – 5:50 PM Centennial Ballroom 300A</p> <p>THPM-B Special Session: Radiation Safety Issues in Radiation Oncology 1:30 PM – 5:40 PM Centennial Ballroom 300B</p> <p>THPM-C Special Session: Early-Career Professionals 1:30 PM – 5:30 PM Centennial Ballroom 300C</p>	<p style="text-align: center;">Spokane Convention Center Exhibit Hall A</p> <p>Sunday 1:30 PM – 4:00 PM Monday 7:30 AM – 4:00 PM Tuesday 8:00 AM – 4:00 PM Wednesday 8:00 AM – 4:00 PM Thursday 8:00 AM – 11:00 AM</p> <hr/> <p style="text-align: center;">Exhibit Hall Hours</p> <p style="text-align: center;">Exhibit Hall A</p> <p>Monday 12:00 PM – 7:00 PM Tuesday 9:30 AM – 5:00 PM Wednesday 9:30 AM – 12:00 PM</p> <hr/> <p style="text-align: center;">Business Meetings</p> <p style="text-align: center;">Monday, 18 July 2022</p> <p>Accelerator Section Business Meeting 4:55 PM – 5:55 PM Centennial Ballroom 300B</p> <p style="text-align: center;">Tuesday, 19 July 2022</p> <p>Environmental/Radon Section Business Meeting 5:00 PM – 5:30 PM Centennial Ballroom 300B</p> <p>Women in Radiation Protection Section Business Meeting 5:00 PM – 5:30 PM Centennial Ballroom 300C</p> <p>AAHP Business Meeting 5:30 PM – 6:30 PM Centennial Ballroom 300A</p> <p style="text-align: center;">Wednesday, 20 July 2022</p> <p>Decommissioning Section Business Meeting 10:45 AM – 11:45 AM Centennial Ballroom 300D</p> <p>HPS Business Meeting 5:45 PM – 6:45 PM Centennial Ballroom 300 A</p> <p style="text-align: center;">Thursday, 21 July 2022</p> <p>AIRRS Business Meeting 12:00 PM – 1:00 PM Centennial Ballroom B</p> <p>Homeland Security Section Business Meeting 12:15 PM – 1:15 PM Centennial Ballroom C</p> <p>Military Section Business Meeting 12:15 PM – 1:15 PM Centennial Ballroom A</p> <p>Medical Section Business Meeting 4:20 PM – 5:20 PM Centennial Ballroom 300B</p> <p>Non-Ionizing Section Business Meeting 4:35 PM – 5:35 PM Centennial Ballroom 300A</p> <p>Early Career Section Business Meeting 5:00 PM – 5:30 PM Centennial Ballroom 300C</p>

NOTE FOR CHPs

The American Academy of Health Physics has approved the following meeting-related activities for continuing education credits for CHPs:

- Meeting attendance is granted 1 CEC per contact hour, excluding meals and business meetings;
- AAHP 8-hour courses are granted 16 CECs each;
- HPS 2-hour PEP courses are granted 4 CECs each;
- HPS 1-hour CELs are granted 2 CECs each.

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67th Annual Meeting

HEALTH PHYSICS SOCIETY

Spokane Convention Center • Spokane, WA • 17-21 July 2022

Welcome

The Columbia Chapter of the Health Physics Society welcomes you to Spokane and the 67th Annual Meeting of the HPS. Spokane is a gem of the Inland Northwest with something for everyone close by to our conference activities. Riverfront Park provides beautiful walks, breathtaking waterfalls (including the largest urban waterfall in the country), sculptures, and activities for children of all ages. There are over 100 eating and drinking establishments within easy walking distance, and shopping abounds in the heart of downtown Spokane. A short ride can take you to museums and the gardens of Manitou Park. Check out the link www.visitspokane.com to find more to do. Take time to enjoy the beautiful and relaxing surroundings of this meeting.

PEP/CEL Ready Room

The PEP/CEL Ready Room will be combined with the Speaker Ready Room in Room 303 AB in the Spokane Convention Center from Sunday-Thursday.

Speaker Information

Technical Sessions Speaker Instructions

You are allotted a total of 12 minutes of speaking time unless you have been notified otherwise.

The Speaker Ready Room (Room 303 AB) will be open Sunday from 2:00 PM – 5:00 PM, Monday through Wednesday from 7:30 AM – 5:00 PM, and Thursday 7:30 AM – 10:00 AM. You must check in at the Speaker Ready Room (even if you have already submitted your presentation) no later than the following times:

Presentation Time

Monday AM-PM

Tuesday AM-PM

Wednesday AM-PM

Thursday AM

Check-In Deadline

5:00 PM Sunday

5:00 PM Monday

5:00 PM Tuesday

5:00 PM Wednesday

Please report to your session room 10 minutes prior to the session start to let your session chair(s) know that you are there.

Posters in Exhibit Hall A must be put up for display between 10:00 AM and 12:00 PM on Monday and removed on Wednesday by 11:00 AM.

SAVE
THE
DATE

HPS 68th Annual Meeting

23–27 July 2023 • Gaylord National Harbor

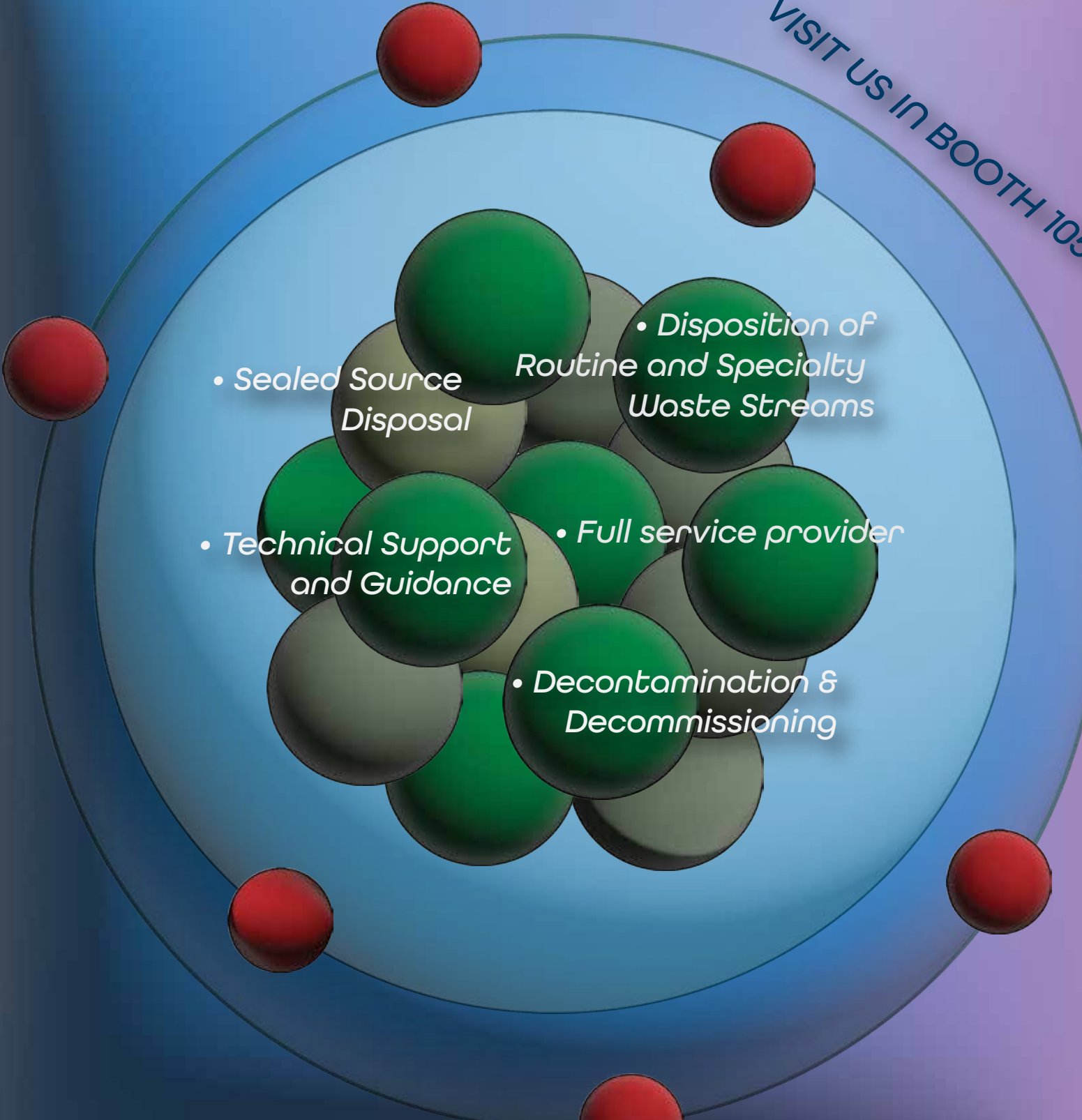
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COMPANION PROGRAM

Information for Registered Companions

Companion Registration cost is \$130 and includes the Welcome Reception, Monday-Thursday breakfast buffet at The Davenport Grand, and lunch and breaks in the Exhibition Hall. There will not be a separate Hospitality Room, however the Local Arrangements Committee staff will be happy to answer your questions or assist in finding the answer.

Monday, 18 July

Welcome Reception

*5:30 PM – 7:00 PM,
Exhibit Hall A, Spokane Convention Center*

Come see old friends and make new ones! Enjoy hors d'oeuvres with a cash bar, 5:30 PM – 7:00 PM.

Monday, 18 July

Welcome to Spokane Companion Orientation

*Spokane Representative – 9:00 AM - 10:00 AM,
The Davenport Grand, Meeting Room 5*

The city orientation takes place Monday, 18 July from 9:00 AM to 10:00 AM. A representative from Spokane will be on hand to describe some of the many opportunities, provide maps, and answer questions.

Monday, 18 - Thursday, 21 July

Companion Breakfast

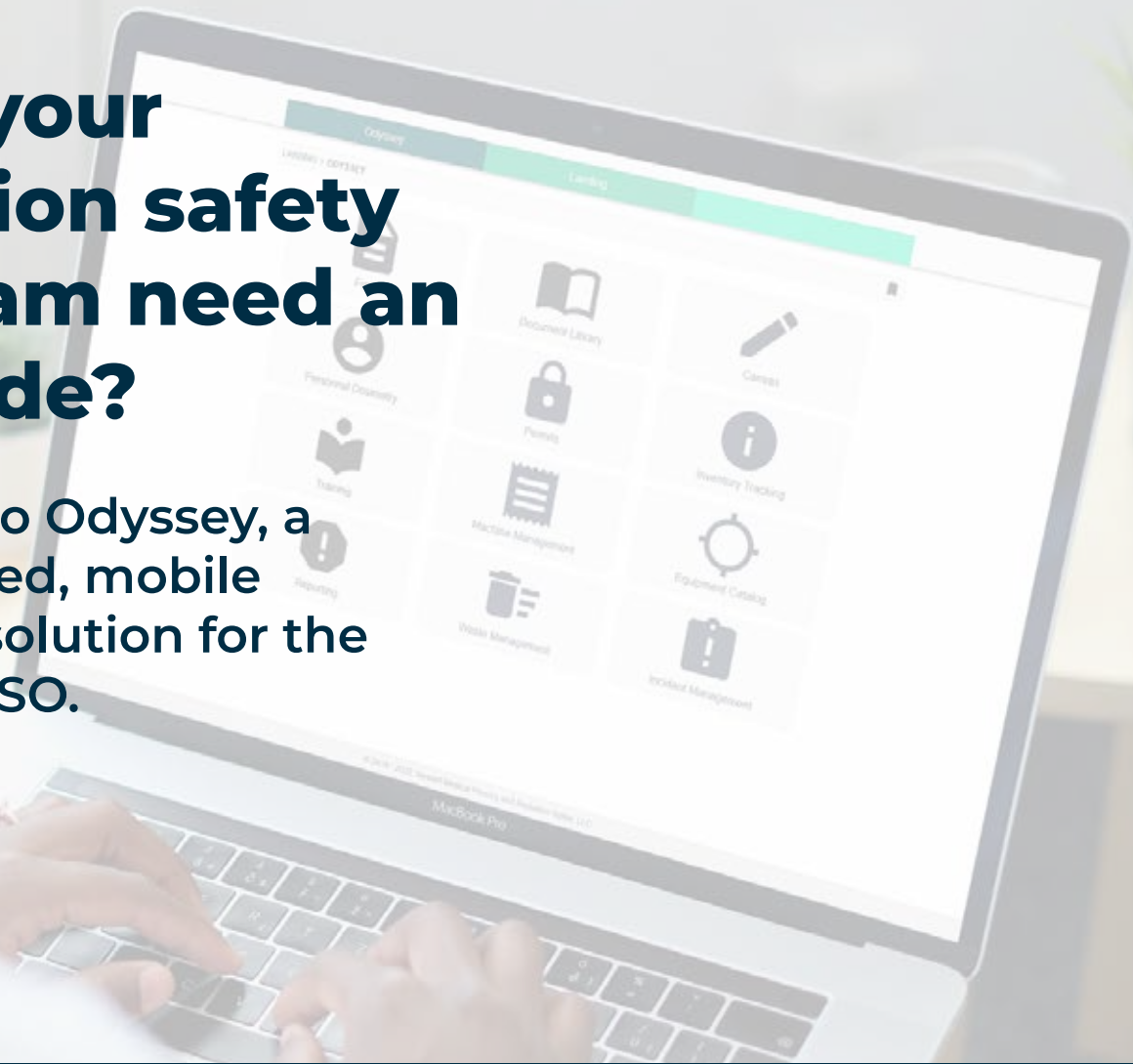
6:30 AM - 10:30 AM, The Davenport Grand

Companion Registration includes Monday – Thursday breakfast buffet at The Davenport Grand, 6:30 AM – 10:30 AM. A delicious buffet awaits you including made-to-order omelets, scrambled eggs, breakfast meats (sausage and bacon), French toast, pancakes, hot oatmeal, assorted pastries, fresh fruits, juice, coffee, and tea.

Registered companions are welcome to come to the lunch and breaks in Exhibit Hall A.

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- Waste Management

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IN THE EXHIBIT AREA**

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Committee/Business Meetings

Meetings take place at the Spokane Convention Center unless otherwise noted.

Saturday, 16 July 2022

Finance & Executive Committee Meeting

7:30 AM – 4:00 PM Davenport, Meeting Room 11

NRRPT Meeting

8:00 AM – 4:00 PM Davenport, Terrace Room West

Student Orientation

5:00 PM – 6:00 PM Davenport, Meeting Room 3

Government Relations Committee

12:30 PM – 2:00 PM Room 401 B

Public Information Committee

3:00 PM – 4:00 PM Room 401 B

AAHP Business Meeting

5:30 PM – 6:30 PM Centennial Ballroom 300A

CSU Reception

5:30 PM – 7:30 PM Davenport, Meeting Room 1

Purdue Reception

5:30 PM – 7:30 PM Davenport, Terrace Room West

Sunday, 17 July 2022

NRRPT

8:00 AM – 4:00 PM Davenport, Terrace Room West

HPS Board of Directors

8:30 AM – 5:00 PM Room 207

HPS Science Support Committee

12:30 PM – 5:00 PM Room 202 C

Science Teachers Workshop

12:30 PM – 5:00 PM Room 206 A

Student Speed Networking

3:30 PM – 5:00 PM Room 206 B

Quiz Bowl

5:00 PM – 6:30 PM Room 206 C

Wednesday, 20 July 2022

Membership Committee

10:00 AM – 12:00 PM Room 401 A

President Meeting with BOD Designates

10:00 AM – 5:00 PM Room 301

Awards Lunch

12:00 PM – 2:30 PM Exhibit Hall B

Health Physics Society Standards Committee

12:30 PM – 2:30 PM Room 401 B

Student Support Committee

2:30 PM – 3:30 PM Room 401 A

HPS Business Meeting

5:45 PM – 6:45 PM Centennial Ballroom 300 A

Monday, 18 July 2022

Elda Anderson Breakfast

6:45 AM – 8:00 AM Davenport, Meeting Room 4

NRRPT Meeting

8:00 AM – 4:00 PM Davenport, Terrace Room West

Intersociety Relations Committee

9:00 AM – 10:00 AM Room 401 A

Academic Education Committee

12:00 PM – 1:00 PM Room 401 A

Thursday, 21 July 2022

HPS Executive/Finance Committee Meeting

10:00 AM – 11:30 AM Room 301

HPS Board of Directors Meeting

11:30 AM – 2:30 PM Room 301

AIRRS Business Meeting

12:00 PM – 1:00 PM Centennial Ballroom B

Program Committee Meeting

12:00 PM – 1:30 PM Room 401 A

Homeland Security Section Business Meeting

12:15 PM – 1:15 PM Centennial Ballroom C

Military Section Business Meeting

12:15 PM – 1:15 PM Centennial Ballroom A

Tuesday, 19 July 2022

NRRPT Meeting

8:00 AM – 4:00 PM Davenport, Terrace Room West

Health Physics Publications Team Meeting

8:30 AM – 10:00 AM Room 401 A

ANSI/HPS N13.45 Working Group

9:00 AM – 12:30 PM Room 401 C

HPS Awards Luncheon

Wednesday, 20 July • 12:00 PM – 2:30 PM
Spokane Convention Center, Exhibit Hall B

Join us Wednesday, 20 July, for the HPS Awards Program. We look forward to seeing you by 12:30 PM for the presentation at the Spokane Convention Center. There will be a buffet lunch provided that begins at 12:00 PM.

The HPS program committee has applied to CAMPEP for MPCEC credits for appropriate sessions.

Please contact Sandy Konerth,
SKonerth@versantphysics.com
for more information.

Sunday-Thursday

PEPs, CELs, Committee Meetings, Exhibits, and Sessions (all events) take place at the Spokane Convention Center.

Student Events

Student Orientation

Saturday, 16 July, 5:00 PM – 6:00 PM
Davenport, Meeting Room 3

Quiz Bowl

Sunday, 17 July, 5:00 PM– 6:30 PM
Room 206 C

Speed Networking Event/ Mentor Reception

Sunday, 17 July, 3:30 PM – 5:00 PM
Room 206 B

Exhibitor Luncheons

Monday, 18 July, 12:00 PM
Tuesday, 19 July, 12:00 PM
Exhibit Hall A

Welcome Reception

Monday, 5:30 PM – 7:00 PM
Exhibit Hall A

HPS Awards Lunch

Wednesday, 20 July, 12:00 PM – 2:30 PM
Exhibit Hall B

Speaker Ready Room

Spokane Convention Center • Room 303 AB

Sunday: 2:00 PM – 5:00 PM

Monday-Wednesday: 7:30 AM – 5:00 PM

Thursday: 7:30 AM – 10:00 AM

You must check in at the Ready Room
(even if you have already submitted your presentation).

Note For CHPs

The American Academy of Health Physics has approved the following meeting-related activities for continuing education credits for CHPs:

- Meeting attendance is granted 1 CEC per contact hour, excluding meals and business meetings;
- AAHP 8-hour courses are granted 16 CECs each;
- HPS 2-hour PEP courses are granted 4 CECs each;
- HPS 1-hour CELs are granted 2 CECs each.

IMPORTANT EVENTS

Quiz Bowl

You and your friends can test your knowledge against other HPS members (members are encouraged to group with students and young professionals). Join in on the fun Sunday, 17 July, 5:00 PM– 6:30 PM, at the Spokane Convention Center, Room 206 C.

Student Mentor Speed Networking

This event will serve as a way for students and early career health physicists to meet potential mentors within the society who can help guide their growing career with industry/academia recommendations and suggestions. Join in on Sunday, 17 July, 3:30 PM – 5:00 PM, at the Spokane Convention Center, Room 206 B.

Welcome Reception

The Welcome Reception this year will be held on Monday, 18 July from 5:30 PM – 7:00 PM in Exhibit Hall A. Join fellow attendees for a time to socialize and renew old acquaintances. A cash bar will be available with appetizers.

HPS's 'Ask-the-Expert' Social

Calling all Ask-The-Experts topic editors, experts, and contributors! Join the team for a social night out on Wednesday, July 20 at 5:30pm at Brick West Brewing, 1318 W 1st Ave, Spokane, WA 99201

Exhibits

Free Lunch! Free Lunch! – 12:00 PM, Monday, 18 July and Tuesday, 19 July. All registered attendees are invited to attend a complimentary lunch in Exhibit Hall A.

Breaks Monday Afternoon-Wednesday Morning – Featuring morning continental breakfasts and afternoon refreshments such as fruit, ice cream, and cookies. Be sure to stop by and visit with the exhibitors while enjoying your refreshments!

Sessions and Course Locations

Sunday PEPs are in the Spokane Convention Center; PEPs, CELs, and all sessions Monday through Thursday will take place at the Spokane Convention Center.

AAHP and ABHP Awards Luncheon

Spokane Convention Center, Ballroom 111 C
Tuesday, 19 July • 12:00 PM – 2:00 PM

HPS Awards Lunch

Join us Wednesday, 20 July, for the HPS Awards Program. We look forward to seeing you by 12:30 PM for the presentation at the Spokane Convention Center. There will be a buffet lunch provided that begins at 12:00 PM.

Again this YEAR!

PEP Courses will have presentations posted online for those who have signed up for them prior to the meeting. There will be no hard copy handouts. See page 52 for course information.

Things to Remember!

All speakers are required to check in at the Speaker Ready Room (Room 303 AB) in the Spokane Convention Center, at least one day prior to their assigned presentation.

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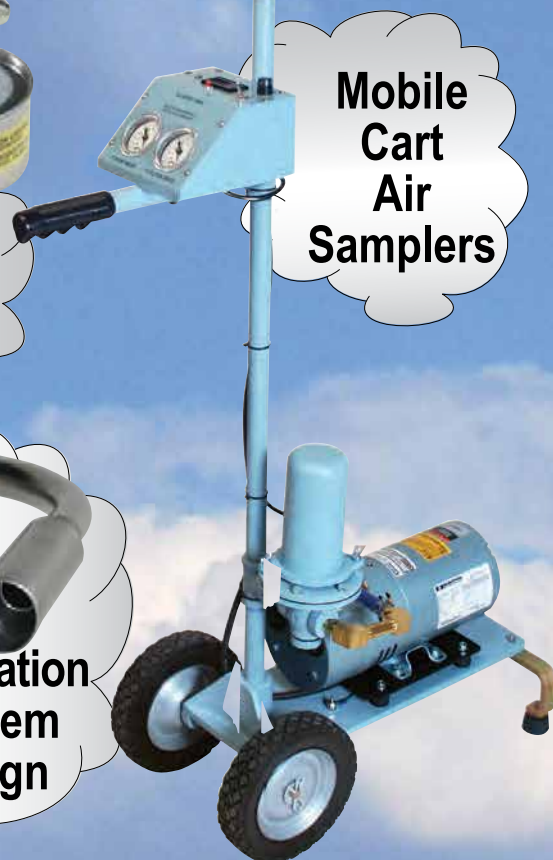
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HPS AWARDS LUNCHEON

Wednesday, 20 July • Spokane Convention Center, Exhibit Hall B
12:00 PM – 2:30 PM – Awards Luncheon

Awards

Introduction by John Cardarelli II, President
Presented by Eric Goldin, Awards Committee Chair

Recognition of 50 Year Members

Recognition of Student Fellowship & Scholarship Recipients

Recognition of Student Travel Grant Recipients

Announcement of Health Physics-Related Awards

Student Science Award

Fellow of the Health Physics Society Awards and Certificate Presentations

Geoffrey G. Eichholz Outstanding Science Teacher Award

Distinguished Scientific Achievement Award

Elda E. Anderson Award

Adjournment

2022 HPS 50 Year Members

John F. Agnew
Jerry D. Allison
Caridad Borrás
Howard W. Dickson
Richard L. Doty
Michael P. Grissom
John Handloser, Jr.
Paul W. Harvey
Elizabeth P. Katsikis
Sheila I. Kronenberger
Linda L. Morris
Francis M. Roddy
Mike Singh
Henry B. Spitz
Orhan Suleiman
John E. Till

Student Fellowships

We appreciate the sponsors and recognize the merits of the students in the following fellowships that provide important financial support to students in our health physics teaching programs:

Health Physics Society Fellowships

Robert Dawson, University of Florida
Sean Domal, University of Florida

Robert Gardner Memorial Fellowship

Ryan Tan, University of Tennessee

Robert S. Landauer, Sr., Memorial Fellowship

Andrew Rosenstrom, Georgia Institute of Technology

Richard J. Burk, Jr., Fellowship

Sarah Donaher, Clemson University

J. Newell Stannard Memorial Fellowship

Julian Newmyer, University of Tennessee

Dade W. Moeller Scholarship

Ethan Asano, Texas A&M

F. Ward Whicker Scholarship

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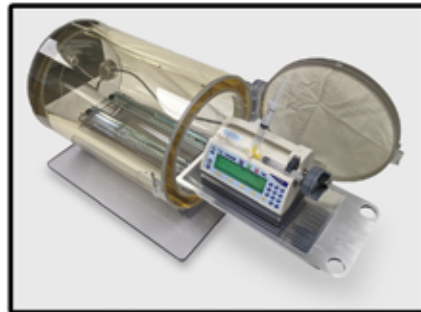
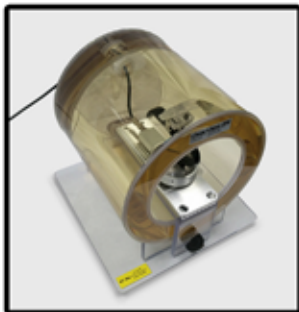


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Student Travel Grant Recipients

These grants enable health physics students to attend and participate in our annual meeting. Additional support was received from the Medical Health Physics Section.

Vanessa Adriatico
Oregon State University

Johnson Aina
Idaho State University

Mashaël Almowallad
Illinois Institute of Technology

Eric Oforu Asare
University of Ghana-School of Nuclear and Allied Sciences

Ignacio Bartol
Georgia Institute of Technology

Yuiko Chino
ERHS, Colorado State University

Long Kiu Chung
Stanford University

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Wei-Hsung Wang, Ph.D., CHP, CSP, CLSO, FHPS

Joyce P. Davis Memorial Award

Presented in recognition of exemplary service as a role model in upholding the ethical and professional standards of the Academy.

Dr. Samuel Baker, CHP

Nancy K. Johnson National Service Award

Presented to individuals who have provided exceptional service to the Academy during the immediate Past President's term of office..

James P. Nunn, MS, CHP, DABR

Accelerator Section Awards

H. Wade Patterson Memorial Award

Established in 2003, the H. Wade Patterson Memorial Award recognizes outstanding student presentations on accelerator health physics at the annual meeting. The winner receives a check and plaque.

Lutz Moritz Memorial Award

Established in 2009, the Lutz Moritz Memorial Award recognizes outstanding student presentations on accelerator health physics at the Annual Meeting. The winner receives a check and plaque.

Academic, Industrial, and Research Radiation Safety (AIRRS) Section Award

Outstanding Radiation Safety Program Award

Established in 2022, this brand new award acknowledges an exceptional Radiation Safety Program in an academic, industrial or research institution that uses radioactive materials or radiation producing devices. The winning organization receives a Plaque and the representative from the organization receives a complimentary registration at the annual meeting. This award will be presented at the AIRRS section business meeting.

University of Massachusetts Lowell (UML) Radiation Safety Office

Homeland Security Section Award

The Health Physics Society Homeland Security Section honors those who exemplify outstanding service and dedication to the HSS.

Daniel J. Blumenthal

Military Health Physics Section Awards

Superior Civilian Service Award

Established in 2014, the Superior Civilian Service Award recognizes a person who has distinguished himself or herself in service to our Country over a long career as a civilian military health physicist and is presented at the Annual Meeting. The winner receives a plaque.

Michael "Mike" R. Call

Brian B. Hearty

Young Military Health Physicist of the Year Award

Established in 2014, the Young Military Health Physicist of the Year Award recognizes a young military health physicist for excellence in (1) research or development, (2) discovery or invention, (3) devotion to military health physics, and/or (4) significant contributions to the profession of military health physics and is presented at the annual meeting. The winner receives a plaque and a one-year membership in the Health Physics Society.

Kristina D. Yeppez

Non-Ionizing Radiation Section Service Award

Established in 2018, this award is designed to acknowledge outstanding contributions to the science and technology of non-ionizing radiation safety. The recipient of the award is recognized for accomplishments of fundamental importance to the practice, acceptance, and advancement of Non-Ionizing Radiation Protection

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Student Science Award

This award recognizes outstanding contributions by students in grades 6–12 to the understanding of the applications of radiation and its impact on the environment and health. Nominations for this award can be made by any full member of the Society or by a chapter. This award is presented at a meeting of the nominating chapter or a chapter near the awardee's residence.

Devarshi Dalal

Use of Artificial Intelligence for Obtaining Optimal Wrist X-Rays

Fellows

To honor senior members of the Society who have made significant administrative, educational, or scientific contributions to the profession of health physics.

2022 Fellows

Keith Eckerman
Philip C. Fulmer
John Keklak
David Medich

Geoffrey G. Eichholz Outstanding Science Teacher Award

To honor teachers who have made significant contributions to educating students in topics related to the field of radiation safety. Award consists of an Associate Membership.

Huitzilin Ortiz

Distinguished Scientific Achievement Award

This award is designed to acknowledge outstanding contributions to the science and technology of radiation safety. The recipient of the award is recognized for accomplishments of fundamental importance to the practice, acceptance, and advancement of the profession of health physics. It is awarded in memory of those scientists who contributed in an outstanding way to the development of scientific knowledge for the protection of man and his environment. (Prior to 1984 this was called the Distinguished Achievement Award.)

Harold L. Beck

Award consists of a plaque and life membership in the Society

Elda E. Anderson Award

This award is presented to a young member of the Health Physics Society to recognize excellence in:

1. Research or development
2. Discovery or invention
3. Devotion to health physics, and
4. Significant contributions to the profession of health physics

Sara Dumit

Award consists of a certificate and a \$1,000 check



HPS Speed Networking

Join the HPS Student Support Committee for the third annual Speed Networking Event and Mentor Reception! After the resounding success of the first Speed Networking Event in 2019, the HPS Student Support Committee is excited to once again host the dynamic and engaging event aimed at allowing students and early career professionals to connect with more experienced individuals within the Health Physics Society in a fun and relaxed atmosphere (with snacks, of course). Everyone is welcome, we need all of you to make this event a success!

HPS Quiz Bowl

This year, the Speed Networking event will be directly followed by the HPS Annual Quiz Bowl. The Quiz Bowl is a great chance to exercise your Health Physics muscles! Students and young professionals, meaning those yet to become a CHP, are encouraged to participate and everyone is welcome to come cheer on the participants! The questions will range from “you should know this” to advanced, with some fun trivia mixed in. You can sign up as a team of 3 or 4 or sign up individually to be teamed up during the event!

Events sponsored by the HPS Student Support Committee

Speed Networking

Sunday, 17 July 2022
3:30 – 4:45 PM

Convention Center
Room 206 B

Quiz Bowl

Sunday, 17 July 2022
5:00 – 6:30 pm

Convention Center
Room 206 C

For more information contact:

Dawn Montgomery
(Speed Networking)
damontg@clemson.edu

-or-

Norbert Hugger
(Quiz Bowl)
HPSQuizBowl@gmail.com



2022 EXHIBIT HALL FLOOR PLAN

Exhibit Hall A



View the latest floorplan and company profiles on your phone or tablet.
Scan the QR Code or visit hps2022.expofp.com.

Exhibit Hall Hours

Monday, July 18
12:00 PM – 7:00 PM

Tuesday, July 19
9:30 AM – 5:00 PM

Wednesday, July 20
9:30 AM – 12:00 PM

Breaks

Tuesday AM – Wednesday AM
Featuring morning continental breakfasts and afternoon refreshments. Be sure to stop by and visit with the exhibitors while enjoying your refreshments.

Lunches

Monday – Tuesday, 12:00 PM
All registered attendees are invited to attend a complimentary lunch in Exhibit Hall A.

Welcome Reception

Monday, 5:30 PM – 7:00 PM
Join fellow attendees in the Exhibit Hall A for a time to socialize and renew old acquaintances.

2022 HPS EXHIBITORS

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Booth: 119

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Manufacturer of the Radiation Alert® product line, offering affordable handheld ionizing radiation detection instruments including Geiger counters, dosimeters, multi-channel analyzers, Area Monitors, for surface and air contamination. Proven reliable in Emergency Response, environmental, industrial, laboratory, research, Health physics, and educational fields. We provide excellence in instrumentation, reliability and customer service.

Spectral Labs Incorporated

15920 Bernardo Center Drive
San Diego, CA 92127
858-207-3727
spectrallabs.com

Booth: 405

Silver Sponsor

The Spectral Labs mission is to leverage our broad technical skill set and the product development passion of our Employee Owners to innovate practical, high-quality solutions developed through keen focus on customer requirements. Our experience lies in product development and manufacturing of instrumentation and software for military and first responders.

Spectrum Techniques

Booth: 214

106 Union Valley Road
Oakridge, TN 37830
865-482-9937
www.spectrumtechniques.com

Spectrum Techniques is your primary source for exempt quantity radionuclides, radiation detection and measurements instrumentation. Applications include teaching in nuclear medicine, health physics, chemistry, biology and nuclear engineering. See our web site at Spectrumtechniques.com for MCAs, nuclear counters and ratemeters. Source types include disk, rod, laminated and needle sources.

Thermo Fisher Scientific

Booth: 415

1 Thermo Fisher Way
Oakwood, OH 44146
800-766-7000
www.thermofisher.com/us/en/home/industrial/radiation-detection-measurement.html

The radiation detection and measurement portfolio of products from Thermo Fisher Scientific have been used in a wide range of applications throughout the world. From TLD crystal growth to spectroscopic handheld instruments, we have a solution for your radiation detection and identification needs.

Thomas Gray & Associates, Inc. Booth: 409

1205 West Barkley Avenue
Orange, CA 92868
714-997-8090
TGAINC.com

Thomas Gray and Associates, Inc. (TGA) is a licensed radioactive services company that offers a full suite of health physics consulting that includes facility decommissioning, on-site services, training, radioactive materials processing, disposal brokerage, nuclide identification, transportation, packaging, and decay-in-storage services.

Ultra Energy

Booth: 124

7 Lancaster Road
Ferndown Industrial Estate
Wimborne Dorset, BH21 7SQ UK
44 1202 850450
www.ultra-electronics.com

Ultra Electronics Nuclear Control Systems specialise in the supply of radiation detection systems to the nuclear industry. Product supplied include measurement instruments for dose-rate, contamination and the measurement of radioactive concentration in air and liquids. Ultra Electronics - NCS support operating NPP's, fuel cycle facilities and decommissioning projects around the World.

U.S. Nuclear Regulatory Commission (NRC)

Booth: 225

11555 Rockville Pike, MS TWFN 2A77
Rockville, MD 20852
301-415-7000
www.nrc.gov

The mission of the U.S. Nuclear Regulatory Commission is to license and regulate the Nation's civilian use of radioactive materials to provide reasonable assurance of adequate protection of public health and safety and to promote the common defense and security and to protect the environment.

USTUR Washington State University

Booth: 112

1845 Terminal Drive, Suite 201
Richland, WA 99354
509-946-6870
ustur.wsu.edu

The United States Transuranium & Uranium Registries (USTUR) is a research program that studies actinide elements deposited within the human body – in persons with measurable, documented exposures to those elements.

Versant Medical Physics and Radiation Safety

Booth: 107

119 N. Church St, Suite 201
Kalamazoo, MI 49007
888-316-3644
www.versantphysics.com

GOLD SPONSOR

Versant Physics is the creator of Odyssey, a Radiation Safety Software suite used by Hospitals, Pharmaceutical companies, Businesses, and Universities. Versant Physics also provides exceptional quality consulting and support services including RSO support, Radiation Safety Audits, Surveys, Physics Calculations, Online Continuing Education Courses, and Personnel Dosimetry Badge Management services.

Zievert

Booth: 224

6 Huron Dr, Suite 1B
Natick, MA 01760
508-653-7100
www.zievert.com

Silver Sponsor

Zievert is offering more than 100 types of radiation detection instruments, including radiation survey meters, activity counters, radioisotope identification devices (RIDs), backpack radiation detectors (BRDs), pedestrian and vehicle portal monitors (RPMs), etc. Additional information is available on www.zievert.com

2022 UNIVERSITY TABLES

Clemson University

342 Computer Ct.
Anderson, SC 29625
864-656-1014
www.clemson.edu/neesrwm

Colorado State University

CSU/ERHS 1618 Campus Delivery
Fort Collins, CO 80523
970-491-0563
vetmedbiosci.colostate.edu/degree-programs/graduate/ms-radiological-health/health-physics/

Colorado State University offers an MS in health physics (ABET accredited), with concentrations in radioecology and radiochemistry, as well as a PhD program. CSU has established relationships with Fukushima, Los Alamos National Laboratory, Idaho National Laboratory and others as key partners in the education of students.

Oregon State University, School of Nuclear Science and Engineering

151 Batcheller Hall
Corvallis, OR 97331
541-737-2343
ne.oregonstate.edu

Founded in 1959, OSU School of Nuclear Science and Engineering boasts a global influence and are one of the top programs in the United States. We are known for our progressive research, large-scale test facilities, and industry and governmental partnerships. With students from around the globe; world-class faculty hailing from China, Iran, Poland, Slovakia, and the United States; and more than 1,300 alumni living and working in the United States and abroad, we are driving the future of nuclear science through engineering and health physics.

University of Alabama at Birmingham

1716 9th Ave S
Birmingham, AL 35233
541-250-1975
www.uab.edu/shp/cds/health-physics

The UAB MS in Health Physics program strives to provide a quality educational experience that prepares students to be skilled professionals who will equitably serve in a diverse workforce, who will contribute to the profession throughout their careers, and who will uphold the highest standards of ethics and integrity both personally and professionally.

Sunday Professional Enrichment Program (PEP)

All sessions take place in the Spokane Convention Center

SUNDAY

8:00 AM – 10:00 AM

PEP 1-A **Room 201 AB**
Control of Hazards from Ultraviolet Lamps and Arcs
Sliney D

PEP 1-B **Room 201 C**
Alpha Spectroscopy for the Health Physicist
Clemmer M

PEP 1-C **Room 202 AB**
Using the Updated CAP88-PC and STARGET Codes for Estimating Dose and Risk from Chronic Atmospheric Releases
Littleton B

10:30 AM – 12:30 PM

PEP 2-A **Room 201 AB**
Nonionizing Radiation: An Overview of Biological Effects and Exposure Limits
Edwards B

PEP 2-B **Room 201 C**
Gamma Spectroscopy for the Health Physicist
Clemmer M

PEP 2-C **Room 202 AB**
Contemporary Topics in Radiation Protection: Ethics and Insider Threat Security Risks
Emery R

1:30 PM – 3:30 PM

PEP 3-A **Room 201 AB**
Laser Safety for Health Physicists
Edwards B

PEP 3-B **Room 201 C**
New Pixelated CZT 3D Detection System for Applications in Nuclear Power, Nuclear Research & Medical Imaging
Miller DW

PEP 3-C **Room 202 AB**
Introductory R programming with the 'Radsafer' package
Hogue M

3:30 PM – 5:30 PM

PEP 4-A **Room 201 AB**
Retrospective dosimetry in nuclear forensics
Hayes R

PEP 4-B **Room 201 C**
Calculating Effective Dose and Risk of Cancer from Internal Intake and External Exposure to Radioactive Material
Stuenkel D

PEP 4-C **Room 202 AB**
Federal Radiological Response Teams
Groves K

Scientific Program

Presenter's name is asterisked (*) if other than first author. All sessions take place in the Spokane Convention Center.

This meeting has applied to CAMPEP for approval of 25 MPCEC hours..

MONDAY

6:45 AM – 7:45 AM

CEL-1 **Centennial Ballroom B**
How to Remove and Replace your Cesium Irradiator
MacKenzie CJ

10:00 am **MAM-A.3**
DOE Domestic and International Health Studies
Al-Nabulsi I
DOE

10:15 am **MAM-A.4**
NRC's University Nuclear Leadership Program
Coffin S, Hebron-Isreal N
US NRC

8:00 AM – 9:10 AM

MAM-PLEN
Plenary Session
Centennial Ballroom 300AB

10:30 am **MAM-A.5**
Health Physicist: The Next Generation, Building Capacity for our Radiation Protection Future at the Nuclear Regulatory Commission
Clark T
US NRC

8:00 am **MAM-PLEN.1**
Welcoming Comments
Cardarelli J
HPS

10:45 am **MAM-A.6**
An Overview of the 2022 OSTP Recommendations for Coordinating Radiation Biology Research
Boyd MA
U.S. Environmental Protection Agency

8:10 am **MAM-PLEN.2**
Radiological Protection for the Next Generation
Clement C

11:00 am **MAM-A.7**
HPS and DC: The HPS Government Relations Program
Connolly DA
HPS

8:40 am **MAM-PLEN.3**
Landauer Lectureship
Calabrese E

9:30 AM – 11:15 AM

MAM-A
HPS Government Relations Program
Chair: Craig Little
Centennial Ballroom 300A

9:30 am **MAM-A.1**
Interacting with Federal Agencies and Congress: The HPS Government Relations Program
Little CA
HPS

9:45 am **MAM-A.2**
HPS Government Relations Committee Activities
Ring JP
Beth Israel Deaconess Medical Center

9:30 AM – 11:30 AM

MAM-B
Special Session: Data Quality
Chair: Jeff Chapman
Centennial Ballroom 300B

9:30 am **MAM-B.1**
Adapting the Data Quality Process to the Needs of Radiological Emergency Response
Becker EM, Mosser J
Pacific Northwest National Laboratory, Environmental Protection Agency

9:45 am **MAM-B.2**
Upper Tolerance Limits for Radiological Decision Making
Obiri M, Newburn LN, Fagan DK
Pacific Northwest National Laboratory

MONDAY

10:00 am **MAM-B.3**
Statistical methods for subsurface decommissioning
Huckett JC, Weller ZD, Fagan DK, Johnson CD*
Pacific Northwest National Laboratory

10:15 am **MAM-B.4**
Statistical methods to analyze continuously collected data
Fagan DK, Obiri MO, Newburn LN, Bunn AL, Huckett J
Pacific Northwest National Laboratory

10:30 am **MAM-B.5**
Data quality assessment of continuously collected survey data
Bunn AL, Ikenberry TA, Fagan DK, Newburn LL*
Pacific Northwest National Laboratory

10:45 am **MAM-B.6**
In an Age of Misinformation and Disinformation: Yes, Data Quality Still Matters
Chapman JA, Mieskoski R
NNSA

11:00 am **MAM-B.7**
Panel

10:15 am **MAM-C.4**
Thermo Fisher Scientific NetDose Dosimetry Service NVLAP Accreditation
LaFrate PJ
Thermo Fisher Scientific

10:30 am **MAM-C.5**
Revision of the ANSI/HPS N13.11-2009
Ushino T, Benevides LA, Harris, Jr. WS, Isbell KM, Jones DF, Lantz MW, Perle SC, Piper RK, Soares CG
The MJW Companies, US Navy, US Army, Oak Ridge National Laboratory, US Department of Energy, Arizona Public Service, Mirion Dosimetry Service, Pacific Northwest National Laboratory, National Institute of Standards & Technology

10:45 am **MAM-C.6**
Thermo Fisher Scientific NetDose Dosimeter Performance
Ramlo MJ
Thermo Fisher Scientific

11:00 am **MAM-C.7**
Occupational Dose Trends in Cardiology
Kirr M
Landauer

9:30 AM – 11:15 AM

MAM-C **External Dosimetry** *Chair: Nolan Hertel* **Centennial Ballroom 300C**

9:30 am **MAM-C.1**
“Hostages to Compliance”: Optimizing Reasonableness and Implementing Critical Thinking in External Dosimetry
Passmore CN
Passmore Dosimetry Consulting Services

9:45 am **MAM-C.2**
Radiation exposure during boating activities: towards more realistic modelling and less conservatism
*Griffin KT, Hertel NE**
Georgia Institute of Technology

10:00 am **MAM-C.3**
Charged Particle Contributions to Local Skin Dose from Neutron Irradiations
Veinot KG, Hertel NE, Hiller MM, Eckerman KF*
Y-12 National Security Complex, Georgia Institute of Technology, Independent Consultant

9:30 AM – 11:15 AM

MAM-D **Power Reactor** *Chair: Rick Adams* **Centennial Ballroom 300D**

9:30 am **MAM-D.1**
Thirty Years of International NPP Worker Outage Dose Reduction Operating Experience Sharing under OECD NEA / IAEA ISOE Program
Miller DW, Boyer BR
University of Illinois, Tennessee Valley Authority

9:45 am **MAM-D.2**
Radiological Characterization in Bare Leu U-10mo Before And After Heat Treatment
Calderin Morales D, Huber ZF, Soderquist CZ, Arendt CL, Joshi W, Brooks KP, Rossiter MA, Lavender C
Pacific Northwest National Laboratory

10:00 am **MAM-D.3**
Advantages Of Real-Time Positioning for Nuclear Power Health Physics Operations
Rashidifard NB, Jarrow D, Kost J, Berrien W, Moerel F
Mirion Technologies

MONDAY

10:15 am **MAM-D.4**
The Effect of Radiation and Dose on Diffusion Pump Oil
Smith JP, Wright CS, Larson G, Guin T, Bliznyuk VN, DeVol TA
Clemson University, Savannah River National Laboratory

10:30 am **MAM-D.5**
Research Reactor Waste Challenges/Achievements
Doenges DD
University of Missouri Research Reactor

11:00 am **MAM-D.6**
Current Status of Radiation Controlled Areas in Korean Nuclear Power Plants
Kim SJ, Choi WS, Son JH, Kim HP, Song CJ
Chosun University

12:15 PM – 2:15 PM

PEP M-1 **Centennial Ballroom A**
ICRU 95: Operational Quantities for External Radiation Exposure
Hertel NE

PEP M-2 **Centennial Ballroom B**
Laser Safety the Next Level
Barat K

PEP M-3 **Centennial Ballroom C**
Integration of Health Physics into Emergency Response and Information Communication
Sugarman S

PEP M-4 **Centennial Ballroom D**
Internal Dose Calculations for Nuclear Medicine Applications
Sabin M

2:30 PM – 5:50 PM

MPM-A
Special Session: Magnetic Field Effects & Safety for Health Physicists
Chair: Peter Sprenger, John Metyko
Centennial Ballroom 300A

2:30 pm **MPM-A.1**
NMR/MRI Physics Primer
Jafari ME
Morristown Medical Center

2:50 pm **MPM-A.2**
Static Magnetic Field Sources recognized and not so much
Barat KL
Laser Safety Solutions

3:10 pm **MPM-A.3**
Magnetic Resonance Safety
Kanal E
University of Pittsburgh Medical Center

4:10 pm **MPM-A.4**
BREAK

4:30 pm **MPM-A.5**
MR Suite Design & Shielding
Kellogg T
ETS-Lindgren

4:50 pm **MPM-A.6**
Static Magnetic Field Measurements: Overview of Instruments and Techniques
*McWilliams FF, Haes DL**
MIT, Consultant

5:10 pm **MPM-A.7**
Effects of Magnetic Fields on Pacemakers/Defibrillators
Jafari ME
Morristown Medical Center

5:30 pm **MPM-A.8**
Preclinical 7T MRI, micro-PET, and micro-CT in a BSL3
Amurao MR, Szatkowski DJ, Cook SH, Quirk J, Boschert K
Washington University in St. Louis

2:30 PM – 5:55 PM

MPM-B
Accelerator
Chair: Robert May
Centennial Ballroom 300B

2:30 pm **MPM-B.1**
Removal of highly activated Isotope Production Facility window assembly from the window-collimator cask
*Duran MD, Vigil JV**
LANL

2:50 pm **MPM-B.2**
Utility and assessment of the code TALYS-1.96 in accelerator-based production of radioisotopes.
Akabani G
Asociación Mexicana de RadioProtección

MONDAY

3:10 pm **MPM-B.3**
Characterization of DD and DT Neutron Generators at Georgia Tech
Hertel NE, Mukhopadhyay S
Georgia Institute of Technology

3:30 pm **MPM-B.4**
BREAK

3:45 pm **MPM-B.5**
High dynamic range neutron dosimetry: applications of the novel NDX dose rate meters at accelerators
Degtiarenko PV
Jefferson Lab

4:10 pm **MPM-B.6**
An LSTM Deep Learning Network for Background Radiation Prediction
Stavola A, Zhang H, Ferguson H, Degtiarenko P, Li J, Kwan C
Thomas Jefferson National Accelerator Facility, Old Dominion University, Applied Research LLC

4:25 pm **MPM-B.7**
Analysis of Relative Hazards and Detection Capabilities for Radionuclides at the Spallation Neutron Source
Hillis JA
Oak Ridge National Laboratory

4:40 pm **MPM-B.8**
High Power Beam Dump Shielding Design for the LCLS-II-HE Low Emittance Injector
Rosenstrom A, Santana M, Dewji S
Georgia Institute of Technology, SLAC National Accelerator Laboratory

4:55 pm **MPM-B.9**
Accelerator Section Business Meeting

2:30 PM – 4:45 PM

MPM-C
Academic Health Physics
Chairs: Steve Grimm, Angela Meng
Centennial Ballroom 300C

2:30 pm **MPM-C.1**
Development of the Research Facilities to Support a Next Generation University Research Reactor
Hugger NA, Medich DC
Worcester Polytechnic Institute

2:45 pm **MPM-C.2**
Radiation Safety for Animal Research Study - Columbia University's Experience
Meng RA, Caracappa PF
Columbia University

3:00 pm **MPM-C.3**
Mysteries at the Radiation Safety Office
Grimm SL
Georgia Institute of Technology

3:15 pm **MPM-C.4**
Experiencing Ionizing Radiation: A Virtual Reality Radiation Protection Game
Robinson MB, Noey JD, Lieng EY, Mumick HS, Nunu GA, Wade MN, Kearfott KJ
University of Michigan

3:30 pm **MPM-C.6**
Break

4:15 pm **MPM-C.7**
A Training Program For General Laboratory Workers At Academic Institutions
Pickering JJ
Emeritus

4:30 pm **MPM-C.8**
Radiation Detection Design Challenges for a First Year Undergraduate Introductory Engineering Course
Kearfott KJ, Kent AJ, Trager ME, Noey JD
University of Michigan

2:30 PM – 4:15 PM

MPM-D
Risk Assessment
Chair: Darrell Fisher
Centennial Ballroom 300D

2:30 pm **MPM-D.1**
Machine Learning Methods and Multivariate Epidemiology in Radiation Risk Assessment Models
Lee H, Agasthya GA, Hanson HA, Logan JS, Houri JM, Kapadia AJ, Dewji SA
Georgia Institute of Technology, Oak Ridge National Laboratory

2:45 pm **MPM-D.2**
How the Science of Radiation Biology has Helped Remove the Crippling Fear of Low-Level Radiation
Brooks AL, Conca JL, Glines WM, Waltar AE
Washington State University, UFA Ventures, Inc., Texas A&M University, American Nuclear Society

MONDAY

3:00 pm

Dose Mapping Comparison Study of Gamma Rays And X-Rays in Preclinical Models

*Gunther CS, Steri V, Camara Serrano JA, Caravaca Rodriguez J, Nostrand CV, Seo Y
C&C Irradiator Service LLC, University of California San Francisco, University of California Berkeley, Lawrence Berkeley National Laboratory*

MPM-D.3

3:30 pm

Break

MPM-D.6

4:00 pm

Radiological Assessment of Commonly Consumed Food Crops Grown in Rustenburg, South Africa

*Olagbaju PO, Wojuola OB, Tshivhase VM
North West University*

MPM-D.7

3:15 pm

Clonal Hematopoiesis of Indeterminate Potential and the Risk of Exposure Induced Death for Mars Mission Scenarios

*Werneth CM, Patel ZS, Blattinig SR, Thomposn MS, Pattarini JM, Huff JL
NASA Langley Research Center, KBR, NASA Johnson Space Center*

MPM-D.5

4:15 pm

Should the Limit on Radiation Dose to the Public be Revised?

*Fisher DR
Versant Medical Physics and Radiation Safety*

MPM-D.8

4:30 pm

Panel Discussion

MPM-D.9

6:00 PM – 7:00 PM

P: Poster Session

Exhibit Hall A

P.1

The Enhancement of a Radiation Safety Research Laboratory Inspection Program at a Large Academic University

*Ranade RM, Zittle MJ, Campbell PG
University of Washington Seattle*

P.2

Free Web-Based Assessment Scientist and Gamma Spectroscopy Training Provided by US DOE and US EPA to Improve Nuclear Incident Response

Fournier S, Enghauser M, Kalinowski A, Griggs J, Litman R, Chapman J, Gill J
Sandia National Laboratories, US Environmental Protection Agency, Environmental Management Support, Inc., FEMA Nuclear Incident Response Team*

P.3

Review of radium accumulation and effects in algae: a work-in-progress

*Gonzales AK, Donaher SE, Wang J, Powell BA, Martinez NE
Clemson University*

P.4

Radioactive Potassium-40 in Water Softeners

*Billa B, Beitollahi M, Adzanu S, Atkins M
Porters Chapel Academy, University of Utah, Alcorn State University*

P.5

How safe are Organic Fertilizers- A Radioactivity Assessment Study

*Hooker J, Billa J, Adzanu S, Adjaye J
Alcorn State University*

P.6

Radon Levels in Ground Water of Alcorn State University Campus

*Jackson D, Billa J, Adzanu S, Adjaye J
Alcorn State University*

P.7

Radium Concentrations in Sludge Samples from Water Treatment Facilities

*James D, Billa J, Adzanu S, Adjaye J
Alcorn State University*

P.8

Radioactivity in Fish Native to Lower Mississippi Watersheds

*Shoulders F, Billa J, Adzanu S, Adjaye J
Alcorn State University*

P.9

Assessment of personal dosimeter response with energy and geometry of exposure for evaluating the reconstruction of organ dose for Korean radiation workers.

*Jeong HY, Chung YS, Kim JS, Yoo JR, Park SH
KIRAMS, Han Yang Univ*

MONDAY

P.10

Further characterization of BeO detectors for applications in external and medical dosimetry

Kara E, Woda C

Helmholtz Zentrum München

P.11

The Gap in NRC Financial Assurance and Insurance Liability for Blood and Research Gamma Irradiators

Kamen J, Abraham E, Perricelli D, Price S

Mount Sinai, Healthcare Risk Advisors, Alliance Insurance Services Inc

P.12

Characterization of Airborne Particulates Containing Naturally Occurring Radioactive Materials in Welding Rod Manufacturing Industries

Park JH, Lee BM, Lee SY, Kim MS, Kim KP

Kyung Hee University

P.13

Investigation of Unexpected Effluent Peaks on Cyclotron Vault PM-11 Sodium Iodide Detector

*Silvestrini E, North CJ**

Northwell Health, Hofstra University

P.14

Determination of time-dependent counting efficiency to consider the exposure scenario using the transportable radiation detection instruments

Park M, Yoo J, Kim HS, Lee S

Korea Institute of Radiological and Medical Sciences

P.16

A Risk Comparison between Lifestyle, Socioeconomic Status, and Radiation among Japanese Nuclear Workers (J-EPISODE)

Kudo S, Furuta H, Saigusa S

Radiation Effects Association

P.17

Review of Computer Programs for Risk Assessment of Radioactive Waste Overland and Maritime Transportation

Ryu GW, Nam HW, Heo JB, Kwak MW, Kim KP

Kyung Hee University

P.18

Derivation of Dose Constraints of PWR Type Reactor for General Public

Jin YH, Seo HS, Kim KH, Kim JW, Kim KP

Kyung Hee University

P.19

Radiation safety investigation of non-medical planned exposure radiation practices in Taiwan

*Hsu FY, Chen LY**

National Tsing Hua University, Louisiana State University

TUESDAY

6:45 AM – 7:45 AM

CEL-2 **Centennial Ballroom B**
Radiation Protection of the Public and the Environment
Stewart M

8:00 AM – 9:10 AM

TAM-PLEN
Plenary Session
Centennial Ballroom 300AB

8:00 am **TAM-PLEN.1**
Welcoming Update Comments
Cardarelli J
HPS

8:10 am **TAM-PLEN.2**
Long-Term Strategy for Low-Dose Radiation Research in the United States
Gray J

8:40 am **TAM-PLEN.3**
New Initiatives in Radiation Protection Sciences
Held K
NCRP

9:30 AM – 10:30 AM

TAM-A1
Dose Reconstruction
Chair: Mauritius Hiller
Centennial Ballroom 300A

9:30 am **TAM-A1.1**
Revision of the post-Chernobyl Thyroid Dosimetry System in Ukraine
*Masiuk S, Chepurny M, Buderatska V, Ivanova O, Boiko Z, Zhadan N, Fedosenko G, Kukush A, Talerko M, Drozdovitch V**
State Institution "National Research Center for Radiation Medicine of the National Academy of Medical Sciences of Ukraine"; Taras Shevchenko National University of Kyiv, Institute for Safety Problems of Nuclear Power Plants, National Cancer Institute, NIH, DHHS

9:45 am **TAM-A1.2**
Estimation of radiation gonadal doses for the American-Ukrainian trio study of parental irradiation to Chernobyl fallout and germline mutations in offspring
Drozdovitch V, Bakhanova E, Kryuchkov V, Golovanov I, Chizhov K, Bazyka D, Gudzenko N, Trotsuk N, Mabuchi K, Hatch M, Cahoon EK, Little MP, Kukhta T, Berrington de Gonzalez A, Chanock SJ, Chumak V
National Cancer Institute, NIH, DHHS, National Research Centre for Radiation Medicine, Burnasyan Federal Medical and Biophysical Centre, United Institute of Informatics Problems

10:00 am **TAM-A1.3**
Dose reconstruction in the village of Metlino, Techa River region, Southern Urals, Russia
Hiller M, Woda C, Degteva M, Bugrov N, Napier B
Helmholtz Zentrum München, Urals Research Center for Radiation Medicine, Pacific Northwest National Laboratory

10:15 am **TAM-A1.4**
Reconstruction of Organ Dose from Emergency Work Dose at Fukushima: J-EPIISODE
Furuta H, Kudo S, Saigusa S
Radiation Effects Association

10:45 AM – 11:45 AM

TAM-A2
Radiobiology and Biological Response
Chair: Yuiko Chino
Centennial Ballroom 300A

10:45 am **TAM-A2.1**
Difference in Long-term WBC Response in Pediatric and Mature Rhesus Macaques
Chino Y, Olson JD, Cline JM, Johnson TE
Colorado State University, Wake Forest University School of Medicine

11:00 am **TAM-A2.2**
Establishment of the Next Generation Omics-Based Anthropomorphic Phantoms for Radiation Protection - The Impact of The Human Cell Atlas Project.
Akabani G
Asociación Mexicana de RadioProtección

11:15 am **TAM-A2.4**
The Neutrophil to Lymphocyte Ratio Shows Evidence for Chronic Inflammation in a Radium Dial Painter Cohort
Goans RE, Toohey RE, Iddins CJ, Mumma M, McComish SL, Tolmachev SY
MJW Corporation, REAC/TS, International Epidemiology Institute, USTUR

TUESDAY

11:30 am **TAM-A2.5**
Radiobiology of Select Radionuclides in Hanford Site Tank Waste
Glines WM, Brooks AL, Hoel DG
Washington State University Tri-Cities, Medical University of South Carolina

11:00 am **TAM-B.7**
Impact Analysis of Age-based demographic data and FGR 15 on Mortality Estimations in HPAC
Dant JT, Castillo IA, Nye CG
Applied Research Associates, Defense Threat Reduction Agency

9:30 AM – 11:45 AM

TAM-B
Emergency Response
Chair: Steve Sugarman
Centennial Ballroom 300B

11:15 am **TAM-B.8**
The Advisory Team for Environment, Food and Health
Chen G
U.S. EPA

11:30 am **TAM-B.9**
RadResponder Network – A Quick Walkthrough with the Newest Updates
Chen G
U.S. EPA

9:30 am **TAM-B.1**
The Importance Of Effective And Understandable Communication Of Radiation-Related Information
Sugarman SL
SummitET

9:45 am **TAM-B.2**
The Radiation Field Training Simulator (RaFTS): Reducing Dose by Simulating Sources
White GK, Kreek SA, Dunlop WM, Oakgrove JD, Bower DE, Trombino DG, Swanberg EK, Pike SD, King JN
Lawrence Livermore National Laboratory, Argon Electronics (UK) Limited

10:00 am **TAM-B.3**
Final Results from Nuclear Accident Simulation Study Comparing 2017 vs. 1992 Protective Action Guidelines
McMahon MD
Tulane University

10:15 am **TAM-B.4**
Electromagnetic Reliability Effects Probability (EMREP) tool strength and stress testing.
Bak MT
DoD Defense Threat Reduction Agency

10:30 am **TAM-B.5**
Challenges in Translation of Biodosimetry Diagnostics to the Field: Prediction of Total Body and Partial Body Exposures to Radiation Using Plasma Proteomic Expression Profiles
Sproull M, Shankavaram U, Camphausen K
NIH/NCI/ROB

10:45 am **TAM-B.6**
Gamma Radioactivity Detection Limits and Dose Assessment in Artificial Human Urine Using Sodium-Iodide and High-Purity Germanium Detectors
Burn AG, Haines DK, Khan AJ, Torres MA, Faye SA, Costello CA, Hoffman TJ, Semkow TM
Wadsworth Center, NYS Department of Health, Bureau of Environmental Radiation Protection

9:30 AM – 11:00 AM

TAM-C
Topics in Health Physics
Chair: Ben Edwards
Centennial Ballroom 300C

9:30 am **TAM-C.1**
National Academies' Study on Radioactive Sources, Applications and Alternative Technologies
Kosti O
National Academies

9:45 am **TAM-C.2**
An Evaluation of Nuclear Regulatory Commission and Agreement States Future Directives
Jue TM, Gulshan Z, Akhavanik H
California Department of Public Health, Nuclear Regulatory Commission

10:00 am **TAM-C.3**
The current problems in the quantification of radiation exposure
Sabol J
Police Academy of the Czech Republic in Prague

10:15 am **TAM-C.4**
Regulator requirement of smoke detector
Al Somali OY
Saudi Aramco

10:30 am **TAM-C.5**
A Phantom Study of X-ray Fluorescence Measurements of Iron, Zinc, and Selenium in Subcutaneous Blood Pool
Mahjan V, Gherase MR
California State University Fresno

TUESDAY

10:45 am

X-ray Fluorescence Measurements of Strontium Concentration in a Lamb Bone Sample

Gherase MR, Berrios M*
California State University Fresno

TAM-C.6

9:30 AM – 10:45 AM

TAM-E

Special Session: Rad Air NESHAPs

Chairs: Sandra Snyder, Michael Stewart

Room 302AB

9:30 AM – 11:30 AM

TAM-D

Special Session: Use of Drones to Enhance Surveys

Chair: Shannon Thompson

Centennial Ballroom 300D

9:30 am

A Review Of The Applications Of Drones For Radiological Surveys

Thompson SW
PNNL

TAM-D.1

9:30 am

U.S. Environmental Protection Agency Update on the Radionuclide NESHAPs

Walsh JP, Rustick JH
U.S. EPA

TAM-E.1

9:45 am

U.S. Environmental Protection Agency Update on Compliance Codes

Littleton BK, Stuenkel DO*
U.S. Environmental Protection Agency

TAM-E.2

10:00 am

DOE Subpart H Report

Stewart M, Snyder SF*
DOE-HQ, PNNL

TAM-E.3

10:00 am

UAV-Based Gamma Surveys for NORM Applications

Aleksen TJ
Environmental Restoration Group, Inc.

TAM-D.2

10:15 am

Regulatory Overview of Compliance with Washington State Radioactive Air Emissions Regulations During Cleanup of a Breached Cs-137 Irradiator Sealed Source

Martell PJ, Schmidt JW
Washington State Department of Health

TAM-E.4

10:30 am

UAV-borne spectrometry applications for geological mapping and monitoring of radioactive ecological loads (case studies)

Štěpán V, Thinová L, Klusoň J, Martinčík J, Otáhal P
Czech Technical University in Prague, National Institute for Nuclear, Chemical and Biological Protection

TAM-D.3

10:30 am

Surrogate Selection and Methods to Account for Omitted Radionuclides in CAP88PC

Harshman AM, Scofield PA
Oak Ridge National Laboratory, Strata-G

TAM-E.6

11:00 am

A Primer On Drone-Borne Radioelement Mapping

van der Veeke S, Limburg J, Koomans RL
University of Groningen, Medusa Radiometrics

TAM-D.4

12:15 PM – 2:15 PM

PEP T-1

The Case Against The LNT

Fellman A

Centennial Ballroom D

PEP T-2

Performing ANSI Z136-Based Laser Hazard Calculations

Edwards B

Room 302 AB

PEP T-3

Design, Licensing and Commissioning of a New Nuclear Medicine Accelerator Facility

Kelley S

Room 402 C

TUESDAY

1:30 PM – 6:30 PM

TPM-A
AAHP Special Session: The System of Radiological Protection, Part 1

Chairs: Scott Schwahn, Christopher Clement

Centennial Ballroom 300A

1:30 pm **TPM-A.1**
 Why Revise the System of Radiological Protection?
Rühm W, Clement CH
ICRP

2:15 pm **TPM-A.2**
 The Process for Developing New Recommendations for Radiological Protection
Cool DA
ICRP

2:45 pm **TPM-A.3**
 IRPA perspective on the Review of the System of Radiological Protection.
Magnusson SM, LeGuen B, Chapple CL
Icelandic Radiation Safety Authority, IRPA

3:15 pm **TPM-A.4**
 Break

3:45 pm **TPM-A.5**
 How the ICRP System of Radiological Protection Influences EPA's Guidance and Regulations
Nagata JS, DeCair SD, Boyd MA
U.S. Environmental Protection Agency

4:15 pm **TPM-A.6**
 NCRP's Views on Radiation Protection Guidance
Held KD
NCRP

4:45 pm **TPM-A.7**
 Panel

5:30 pm **TPM-A.8**
 AAHP Business Meeting

1:30 PM – 5:30 PM

TPM-B
Special Session: Remediation of Contaminated Sites

Chair: Jeff Whicker, Lisa Manglass

Centennial Ballroom 300B

1:30 pm **TPM-B.1**
 Adaptive Management of Radioactively Contaminated Sites
Whicker JW
Independent Consultant

2:00 pm **TPM-B.2**
 Implementing As Low As Reasonably Achievable to Performance Assessments using Structured Decision Making and Decision Analysis
Black PK, Stockton TB, Perona RA, Catlett KM
Neptune and Company, Inc.

2:30 pm **TPM-B.3**
 Retrospective Detection Sensitivity for GPS-Based Gamma Radiation Surveys
Aleksen TJ, Whicker RD
Environmental Restoration Group, Inc.

3:00 pm **TPM-B.4**
 Radiological Clearance of Property at DOE-EM Sites
Anderson AL
US Department of Energy

3:30 pm **TPM-B.5**
 Break

4:00 pm **TPM-B.6**
 NRC Decommissioning Research and Related Guidance Development
Barr CS, Aird T
US NRC

4:30 pm **TPM-B.7**
 Update on Revisions to the Multi-Agency Radiation Survey and Site Investigation Manual
Stuenkel DO, Anderson AL
U.S. Environmental Protection Agency, U.S. Department of Energy

5:00 pm **TPM-B.8**
 Environmental/Radon Section Business Meeting

TUESDAY

1:30 PM – 5:00 PM

TPM-C
**Special Session: Challenges, Barriers,
 and Successes in an HP Career –
 From STEM to Retirement**

Chair: Wendy Kuhne, Rachel Nichols

Centennial Ballroom 300C

1:30 pm **TPM-C.1**

Challenges, Barriers, and Successes in a HP Career - From STEM to Retirement

Kuhne WW

Savannah River National Laboratory

1:45 pm **TPM-C.2**

Educational opportunities and challenges for women in health physics: a man's perspective.

Harris JT

Purdue University

2:00 pm **TPM-C.3**

Challenges Faced in Recruiting Students and Running a New Masters in HP Program

Caffrey EA

UAB

2:15 pm **TPM-C.5**

Discussion

2:30 pm **TPM-C.8**

Key Decisions that Defined my Career Pathway

Salame-Alfie A

HPS

2:45 pm **TPM-C.9**

Getting Involved in the Health Physics Society – What are you Waiting for??

Simpkins A

ORAU

3:00 pm **TPM-C.10**

Discussion

3:15 pm

Break

3:45 pm **TPM-C.11**

Considerations in knowledge transfer from a “seasoned” health physicist

Higley KA

Oregon State University

4:00 pm **TPM-C.12**

Late Career and Retirement: Giving Back to the Society and STEM

Morris LK

TX Low Level Waste Compact Commission

4:15 pm **TPM-C.13**

Discussion

4:30 pm **TPM-C.14**

Women in Radiation Protection Section

2:30 PM – 5:30 PM

TPM-D
Internal Dosimetry
Chair: Sara Dumit
Centennial Ballroom 300D

2:30 pm **TPM-D.1**

Revision of the ICRP 141 Pu Systemic Model to Incorporate the HAT Model and the Hepatic Portal Vein

Strom DJ, Avtandilashvili M, Felsot AS, McComish SM, Å efl M,

Tabatadze G, Tolmachev SY

Washington State University, NV5/Dade Moeller

2:45 pm **TPM-D.2**

Misclassification of Causes of Death Among USTUR Registrants: Death Certificates vs. Autopsy Reports

McComish SL, Liu X, Martinez FT, Zhou JY, Tolmachev SY

U.S. Transuranium and Uranium Registries, Washington State

University, Weill Cornell Medicine, U.S. Department of Energy

3:00 pm **TPM-D.3**

Dose Assessment following Pu-238 Glovebox Breach at Los Alamos National Laboratory

*Klumpp JA, Bertelli L, Dumit S, Poudel D**

Los Alamos National Laboratory

3:15 pm **TPM-D.4**

Modeling of a plutonium-238 inhalation incident treated with DTPA at Los Alamos National Laboratory

Dumit S, Miller G, Poudel D, Bertelli L, Klumpp JA

Los Alamos National Laboratory, Retired

3:30 pm **TPM-D.5**

BREAK

3:45 pm **TPM-D.6**

Tools for effective communication with radiation workers: Improving how to listen, relate, empathize, and communicate internal doses

Dumit S, Matta T, Klumpp JA

Los Alamos National Laboratory, Oak Ridge National Laboratory

TUESDAY

- | | | | |
|---|------------------------|---|-----------------------|
| <p>4:00 pm
Improvements In Collecting Performance Statistics For Hanford In Vivo Counting Systems
<i>Lungu A, Stamper LJ, Antonio CL</i>
<i>Hanford Mission Integration Solutions (HMIS)</i></p> | <p>TPM-D.7</p> | <p>3:15 pm
Design Improvements to a Low Cost Radiation-Detecting Weather Station for Nuclear Science Outreach
<i>Kent AJ, Noey JD, Kearfott KJ</i>
<i>University of Michigan</i></p> | <p>TPM-E.4</p> |
| <p>4:15 pm
A Novel Biokinetic Model for Chromium and its Intent for Health Physics Applications
<i>Hiller MM, Leggett RW</i>
<i>CheMin GmbH, Oak Ridge National Laboratory</i></p> | <p>TPM-D.8</p> | <p>3:30 pm
Interfacing a Radiation Detector to an Intelligent Radiation Awareness Drone
<i>Kim RA, Trager ME, Davis CC, Ho RS, Kent AJ, Noey JD, Kearfott KJ</i>
<i>University of Michigan</i></p> | <p>TPM-E.5</p> |
| <p>4:30 pm
Review of Uncertain Parameters in ICRP 66 Human Respiratory Tract Model (HRTM)
<i>Margot DE, Kalinowski AE, Cochran LD, Jelsema CM, Dewji SA</i>
<i>Georgia Institute of Technology, Sandia National Laboratories</i></p> | <p>TPM-D.10</p> | <p>3:45 pm
Electronics Circuit Design Considerations for Novel Radiation Detection Instruments
<i>Noey JD, Kent AJ, Jautakas L, Kennings TW, Kearfott KJ</i>
<i>University of Michigan</i></p> | <p>TPM-E.6</p> |
| <p>4:45 pm
Uncertainty Propagation in ICRP 66 Human Respiratory Tract Model (HRTM)
<i>Cochran LD, Jelsema CM, Kalinowski AE, Margot DE, Dewji SA</i>
<i>Sandia National Laboratories, Georgia Institute of Technology</i></p> | <p>TPM-D.9</p> | <p>4:00 pm
Break</p> | <p>TPM-E.7</p> |
| <p>5:00 pm
It Takes Energy to Calculate Dose
<i>Stabin MG</i></p> | <p>TPM-D.11</p> | <p>4:15 pm
A Mapping and Navigation Algorithm for an Intelligent Radiation Awareness Drone
<i>Davis CC, Chung LK, Trager ME, Kim RA, Noey JD, Kearfott KJ</i>
<i>University of Michigan, Stanford University</i></p> | <p>TPM-E.8</p> |

2:30 PM – 5:30 PM

TPM-E
Health Physics Instrumentation

Chair: Rick Adams

Room 302AB

- | | | | |
|--|-----------------------|--|------------------------|
| <p>2:30 pm
Development of Metal Halide Perovskite Semiconductors for Radiation Sensing
<i>Tan R, Lukosi ED, Dryzhakov B, Ahmadi M, Hu B, Charest J, Higgins K, Busch C</i>
<i>University of Tennessee</i></p> | <p>TPM-E.1</p> | <p>4:30 pm
Analysis of Minimum Detectable Concentrations for Environmental Samples in a Novel High Sensitivity Large Volume Spectroscopy System
<i>Noey JD, Kearfott KJ</i>
<i>University of Michigan</i></p> | <p>TPM-E.9</p> |
| <p>2:45 pm
Epithermal Neutron Field for Dosimetry and Instrument Testing
<i>Mozhayev AV, Piper RK, Meza JR, Christ JF, Berg RK, Maine AL, Dutcher EB</i>
<i>Pacific Northwest Natl Lab</i></p> | <p>TPM-E.2</p> | <p>4:45 pm
Quality Control Program for High Precision Radiation Dose Delivery in Operational Health Physics Facilities
<i>Noey JD, Stewart CJ*, Kearfott KJ</i>
<i>University of Michigan</i></p> | <p>TPM-E.10</p> |
| <p>3:00 pm
Application and Comparison of Multi-Robot Exploration Methods for Radioactive Source Localization
<i>Chung LK, Chan A, Li Y, Wong A, Davis CC, Noey JD, Kearfott KJ</i>
<i>Stanford University, University of Michigan</i></p> | <p>TPM-E.3</p> | <p>5:00 pm
Building Our Own: Design Challenges for an Intelligent Radiation Awareness Drone
<i>Trager ME, Kim RA, Davis CC, Ho RS, Phatke A, Sumter KH, Kidambi M, Wang P, Noey JD, Kearfott KJ</i>
<i>University of Michigan</i></p> | <p>TPM-E.11</p> |
| | | <p>5:15 pm
Reevaluating Legacy Neutron Survey Meters
<i>Rashidifard NB</i>
<i>Mirion Technologies</i></p> | <p>TPM-E.12</p> |

WEDNESDAY

6:45 AM – 7:45 AM

CEL-3 Centennial Ballroom B

Establishing a Program to Produce Ac-225 with a Superconducting Linear Accelerator: Lessons Learned

Bakken A

10:00 am WAM-A.3

A Health Physics Evaluation of Yb169 Brachytherapy Treatment for Cervical Cancers

*Jalbert MR, Medich DC
Worcester Polytechnic Institute*

8:00 AM – 9:10 AM

**WAM-PLEN
Plenary Session
Centennial Ballroom 300AB**

8:00 am WAM-PLEN.1

Welcoming Update Comments

*Cardarelli J
HPS*

8:10 am WAM-PLEN.2

History and Accomplishments of the Veterans Advisory Board on Dose Reconstruction

Roadman C

8:40 am WAM-PLEN.3

DOE Dose Reconstruction

*Calhoun G
NIOSH*

10:15 am WAM-A.4

Development of Surface Contamination Action Levels for a Multistate Medical Licensee

*Ram V, Sturchio GM
Mayo Clinic*

10:30 am WAM-A.5

Feasibility of safe outpatient radio-targeted treatment in pediatric patients following administration of Iodine-131 Omburtamab for leptomeningeal disease

*Prasad K, Chu BP, Bellamy M, Pandit-Taskar N
Memorial Sloan Kettering Cancer Center*

10:45 am WAM-A.7

Patient Specific Neutron Shielding For Electronic Device Attached To Proton Patient; Case Study

*Rahimi R, Taylor M, Eblan M, Fan J, Wang P
INOVA Schar Cancer Institute*

11:00 am WAM-A.8

The UF-MSK Computational Phantom Library of Adult and Pediatric Patients for Medical Dosimetry

*Dawson RJ, Baggett JM, Wang Y, Smither WW, Dinwiddie LE, Wehmeier SK, Domal SJ, Kofler CB, Bolch WE
University of Florida*

9:30 AM – 11:15 AM

**WAM-A
Medical Health Physics
Chair: Glenn Sturchio
Centennial Ballroom 300A**

9:30 am WAM-A.1

Medical Radioisotope Production from Uranium and Radium

*Bakken AC, Wahlen RN, Johnson NC, Peters WA, Grimm TL, Boulware CH, Gelis AV
Niowave Inc., University of Nevada Las Vegas*

9:45 am WAM-A.2

Evaluation of Radiation Exposure to Personnel in Novel Biology-Guided Radiotherapy Workflow

*Jaramillo AM, Pagan CE, Chavarria I, Grabarkewitz R, Pompos A, Cai B, Everett S, Amen MJ
UT Southwestern*

9:30 AM – 12:00 PM

**WAM-B
Special Session: DOE Health Studies Part 1
Chair: Isaf Al-Nabulsi, Ashley Golden
Centennial Ballroom 300B**

9:30 am WAM-B.1

New Developments in the Dosimetry of the Japanese Atomic Bomb Survivors

*Cullings HM, Bolch WE, Funamoto S, Sato T, Lee C, Egbert SD, Hertel NE, Domal SJ, Griffin KT, Paulbeck CJ
Radiation Effects Research Foundation, University of Florida, Japan Atomic Energy Agency, US National Cancer Institute, Georgia Institute of Technology, Johns Hopkins University*

9:55 am WAM-B.2

Radiation Risk of Cancer Incidence in the Life Span Study of Atomic Bomb Survivors

*Ozasa K
Radiation Effects Research Foundation*

WEDNESDAY

10:20 am **WAM-B.3**
Biorepository of A-Bomb Survivors and their Offspring
Tanabe O, Hayashi T, Imaizumi M, Kajimura J, Matsuda Y
Radiation Effects Research Foundation

10:45 am **WAM-B.4**
Recent Improvements in Dose Reconstructions for the JCCRER Russian Studies
Napier BA, Smith MA, Eslinger PW, Efimov AV, Vostratin W, Vvedensky VE, Degteva MO, Shishkina EA, Tolstykh EI
Pacific Northwest National Laboratory, Southern Urals Biophysics Institute, Urals Research Center for Radiation Medicine

11:10 am **WAM-B.5**
Follow-up and Risk Analyses in the Mayak and Expanded Techa River Cohorts
Preston DL, Krestinina LY, Sokolnikov ME, Stram DO
Hirosoft International, Urals Research Center for Radiation Medicine, Southern Urals Biophysics Institute, University of Southern California

11:35 am **WAM-B.6**
Radiation Research And The Russian Radiobiological Human Tissue Repository
Loffredo C, Azizova T
Georgetown University, Southern Urals Biophysics Institute

9:30 AM – 11:50 AM

WAM-C
Special Session: The HPS Standards Organization
Chair: Antonio Triventi
Centennial Ballroom 300C

9:30 am **WAM-C.1**
The Health Physics Society Standards Committee (HPSSC)
Triventi A
HPSSC

9:40 am **WAM-C.2**
Radiation Protection Standards: ANSI/HPS N13 Accredited Standards Committee
Barnett JM, Potter CA
Pacific Northwest National Laboratory, Sandia National Laboratories

10:00 am **WAM-C.3**
ANSI N43 Report
*Jones C, Whitman R**
US Army Public Health CMD

10:20 am **WAM-C.4**
Participation In International Radiation Protection Standardization
Herrold JF
University of Wyoming, US NTAG Chair ISO TC 85

10:40 am **WAM-C.5**
Break

10:50 am **WAM-C.6**
Panel

9:30 AM – 11:45 AM

WAM-D
Decontamination and Decommissioning
Chair: Phil Rutherford
Centennial Ballroom 300D

9:30 am **WAM-D.1**
Efficiency Comparison of Hybrid Radiation Transport Variance Reduction Methods for Wide Area Environmental Contamination Assay Applications
Asano EA, Dewji SA
Georgia Institute of Technology

9:45 am **WAM-D.2**
Visual Sample Plan (VSP) geospatial analysis tools for environmental decision making
Huckett JC, Weller ZD, Newburn LN, Fagan DK, Johnson CD, Simpson BC, Bunn AL*
Pacific Northwest National Laboratory

10:00 am **WAM-D.3**
Workplace Monitoring and Energy Analysis Of Low Energy Beta Contamination
Iwatschenko-Borho MI
Thermo Fisher Scientific Messtechnik GmbH

10:15 am **WAM-D.4**
Decommissioning in California: 20+ Years of Politics vs. Science
Rutherford PD
Phil Rutherford Consulting

10:45 am **WAM-D.5**
Decommissioning Section Business Meeting

2:30 PM – 5:30 PM

WPM-A

AAHP Special Session: The System of Radiological Protection, Part 2

Chairs: Scott Schwahn, Christopher Clement

Centennial Ballroom 300A

2:30 pm

WPM-A.1

State Perspectives on Changes to the System of Radiological Protection

*Leek AE, McBurney R
CRCPD, Iowa DPH*

2:45 pm

WPM-A.2

ICRP Radiation Protection Recommendations Considered and Applied to DOE Order 458.1 and DOE-STD 1196-2021

*Corredor CE
Department of Energy*

3:15 pm

WPM-A.3

Medical Uses of Radiation and the System of Radiological Protection

*Dauer LT
Memorial Sloan Kettering Cancer Center*

3:45 pm

WPM-A.4

Accounting for Nonlinearity in Radiation Protection

*Ulsh Brant
M.H. Chew Associates*

4:15 pm

WPM-A.5

Revisiting the Concepts of Reasonableness and Tolerability of Risk in the System of Radiological Protection: ICRP On-Going Reflections

*Schneider TL
ICRP – CEPN*

4:45 pm

WPM-A.6

Panel

2:30 PM – 5:45 PM

WPM-B

Special Session: DOE Health Studies Part 2

Chair: Isaf Al-Nabulsi, Ashley Golden

Centennial Ballroom 300B

2:30 pm

WPM-B.1

U.S. Transuranium and Uranium Registries: 2010 – 2022 Research Accomplishments and Collaborative Efforts

*Tolmachev SY
U.S. Transuranium and Uranium Registries, Washington State University*

2:55 pm

WPM-B.2

Uncertainties in Radiation Dose Assessment for Internally Deposited Plutonium in Support of Radiation Epidemiology

*Sefl M, Zhou JY, Avtandilashvili M, McComish SL, Tabatadze G, Tolmachev SY
U.S. Transuranium and Uranium Registries, Washington State University, U.S. Department of Energy*

3:10 pm

WPM-B.3

Beryllium in Tissues of Former Nuclear Workers

*Avtandilashvili M, LariviÄ“re D, Momoshima N, Wegge D, Brockman JD, Tolmachev SY
U.S. Transuranium and Uranium Registries, Washington State University, Laval University, Kyushu Environmental Evaluation Association, University of Missouri – Columbia*

3:25 pm

WPM-B.4

Plutonium bioassay models for reconstruction of doses for Los Alamos National Laboratory and Rocky Flats workers

*Samuels CE, Leggett RW
ORNL Center for Radiation Protection Knowledge*

3:50 pm

WPM-B.5

Break

4:05 pm

WPM-B.6

Reconstruction of Lung Doses for the Tennessee Eastman Corporation

*Bellamy MB, Dauer L, Eckerman K
MSKCC, ORNL*

4:30 pm

WPM-B.7

Impact of the Department of Energy’s Comprehensive Epidemiologic Data Resource (CEDR) to the Million Worker Study

*Howard SC, Golden AP, Ellis ED, Girardi DJ
Oak Ridge Institute for Science and Education*

WEDNESDAY

4:55 pm

WPM-B.8

Findings from Department of Energy Cohorts in the Million Worker Study: Los Alamos National Laboratory, Rocky Flats Site, and Tennessee Eastman Corporation

Golden AP, Boice, Jr. JD, Howard SC, Cohen SC, Mumma MT, Bellamy MB, Dauer LT, Samuels C, Eckerman EF, Leggett RW Oak Ridge Institute for Science and Education, Vanderbilt University, National Council on Radiation Protection and Measurements, Epidstat, IEI, Memorial Sloan Kettering Cancer Center, Oak Ridge National Laboratory

5:20 pm

WPM-B.9

The Million Person Study of Low-Level and Low-Dose-Rate Health Effects: Importance, Information and Innovation

Dauer LT, Boice, Jr. JD Memorial Sloan Kettering Cancer Center, NCRP, Vanderbilt University Medical Center

2:30 PM – 4:45 PM

WPM-C

Environmental Monitoring

Chair: David Goodman and Jonathan Napier

Centennial Ballroom 300C

2:30 pm

WPM-C.1

Quantifying Preferential Tissue Accumulation and Antioxidant Stress Response of a Marine Mussel After Exposure to Radium Paint

Donaher SD, Dunn RP, Powell BA, Van den Hurk P, Martinez NE Clemson University, University of South Carolina

2:45 pm

WPM-C.2

Use of 14C-PFOA to study uptake and effects of PFOA in Brassica juncea

Wattier BD, Gonzales AK, Donaher S, DeVol TA, Martinez NE Clemson University

3:00 pm

WPM-C.3

Distribution and Radiological Impact Assessment of Natural Radionuclides in Nevada National Security Site

Liu X, Warren RW MSTC

3:15 pm

WPM-C.4

Lightweight, Low-Power, High-Resolution, Pixelated CdZnTe Detectors For Drone-Based Measurements

Goodman DI, Barron DP, Sowers JT, Thomason AM Titan Robotics, Skydio

3:30 pm

WPM-C.5

Environmental Measurement of Gamma and Cosmic Radiation Using a Sensitive Spectroscopic Radiation Pager

Iwatschenko-Borho MA Thermo Fisher Scientific Messtechnik GmbH

3:45 pm

Break

WPM-C.6

4:15 pm

WPM-C.7

Spatial Representation of Determined Transfer Factors

Napier JB Pacific Northwest National Laboratory

4:30 pm

WPM-C.8

Determination of Gross Alpha and Gross Beta Activity in recently imported organic fertilizer samples, Sri Lanka

Weerakkody TL, Dabare PR, Dissanayake CK Sri Lanka Atomic Energy Board

2:30 PM – 3:30 PM

WPM-D

Special Session: Health Physics Evolution in Medical Physics Enterprise

Chair: Ronald Leuenberger

Centennial Ballroom 300D

2:30 pm

WPM-D.1

Health Physics Evolution in Medical Physics Enterprise

Leuenberger RD Louis Stokes VA Medical Center

2:45 pm

WPM-D.2

Enterprise Applications for Medical Physics: Past, Present & Future

Leuenberger RD, Misseldine RE RSO, ARSO*

3:00 pm

WPM-D.3

Medical Physics Enterprise - VHA Radiation Exposure Monitoring (REM) Registry

Leuenberger RD, Misseldine RE, Dietz AT, Jordan D RSO, VA Northeast Ohio Healthcare System (VANEOMS), ARSO, University Hospitals of Cleveland*

3:15 pm

WPM-D.4

Evolving Role of Radiation Safety Officer

Jordan DW University Hospitals Cleveland Medical Center, Case Western Reserve University

THURSDAY

6:45 AM – 7:45 AM

CEL-4 **Centennial Ballroom B**
Managing Generally Licensed Devices
Lewandowski M

8:00 AM – 12:00 PM

THAM-A
**Special Session: Workings of the Health
Physics Society - A “How to” Training Session**

Chair: Timothy Taulbee

Centennial Ballroom 300A

8:00 am **THAM-A.1**
Introduction

8:05 am **THAM-A.2**
Practical strategies to promote inclusiveness
Martinez NE
Clemson University, ORNL

8:25 am **THAM-A.3**
Bylaws, Rules, and Standard Operating Procedures
Braun JS
Mayo Clinic

8:45 am **THAM-A.4**
The Health Physics Society’s ‘Ask-the-Expert’ Feature: A Tool
for Risk Communication
Caffrey EA
Radian Scientific LLC

9:05 am **THAM-A.5**
Transitioning from Student to Early Career Professional for
the Health Physicist
Wilson CA, Cochran LD, Condon C
University of Missouri, Sandia, PNNL

9:20 am **THAM-A.6**
Tips on how to prepare for the ABHP Exam
Johnson TE
Colorado State University

9:45 am **THAM-A.7**
HPS Membership Renewal and Upgrade Overview
Cochran LD
HPS Membership Committee

10:00 am **THAM-A.8**
Break

10:30 am **THAM-A.9**
Getting the Most From Your Health Physics Journal
Ulsh B
Health Physics Journal

10:45 am **THAM-A.10**
Presenting at HPS Meetings: A Program Committee Perspective
Shaw CG
WCS

11:00 am **THAM-A.11**
Awards and Scientific and Public Issues Committees
Goldin EM
Goldin & Associates

11:15 am **THAM-A.12**
HPS Continuing Education Programs: Past, Present, Future
Mahathy JM
ORAU

11:30 am **THAM-A.13**
Radiation Biology for Health Physicists
Ulsh B
M. H. Chew Associates

11:50 am **THAM-A.14**
Discussion

8:00 AM – 12:00 PM

THAM-B
Special Session: AIRRS Roundtable

Chair: Carl Tarantino

Centennial Ballroom 300B

8:00 am **THAM-B.1**
AIRRS Special Session
Tarantino C, Vasudevan L, Root C
AIRRS

8:00 AM – 11:30 AM

THAM-C
**International Collaboration Committee
Special Session: How to Influence the
Future of Radiological Protection**

Chair: George and Amber Harshman

Centennial Ballroom 300C

Please see the online program for the schedule.

THURSDAY

12:15 PM – 2:15 PM

PEP TH-1 **Room 302 A**
Radiation in Flight
Shonka J

PEP TH-2 **Room 302 B**
Radon physics
Hayes R

PEP TH-3 **Room 402 C**
Technical Basis and Operational Experience for Clearance of Personal Property from SLAC Accelerator Facilities
Rokni S

3:05 pm **THPM-A.6**
Review of case studies for radiofrequency exposures in stadiums, on small cells, towers and rooftops
Thatcher AH, Ludick D, Nell J
Thatcher Consulting LLC, Alphawave Mobile Network Products (Pty) Ltd

3:25 pm **THPM-A.8**
NIR Hazards Mitigation for ISS and Lunar Missions
Gaza R, Hayes B, Castro A
Leidos, Exploration & Mission Support 2NASA Johnson Space Center

3:45 pm **THPM-A.9**
Health Physicists' duty to fight misinformation and disinformation.
Edwards BE

1:30 PM – 5:35 PM

THPM-A **Special Session: Non-ionizing Radiation**

Chair: Pete Sprenger and Ken Barat

Centennial Ballroom 300A

4:05 pm **THPM-A.10**
BREAK

4:35 pm **THPM-A.11**
Non-ionizing Section Business Meeting

1:30 pm **THPM-A.1**
A review of the non-ionizing radiation topics and discussions from the first International Radiation Protection Agency's North American Regional Congress.
Sprenger PJ
Naval Medical Research Unit San Antonio

1:50 pm **THPM-A.2**
Impact of Concomitant Electromagnetic Energy (EME) Hazards on the Radio-Frequency (RF) Safety Program
Haes DL
Consultant

2:10 pm **THPM-A.3**
Revision of Ultraviolet Exposure Limits at Shorter Wavelengths - UV-C
Slaney DH
Johns Hopkins University School of Public Health

2:30 pm **THPM-A.4**
Safety Aspects of Germicidal Ultraviolet Radiation
Slaney DH
Johns Hopkins University School of Public Health

2:50 pm **THPM-A.5**
BREAK

1:30 PM – 5:40 PM

THPM-B **Special Session: Radiation Safety** **Issues in Radiation Oncology**

Chair: John Metyko

Centennial Ballroom 300B

1:30 pm **THPM-B.1**
Alpha DaRT (TM) Institutional Review Board and Clinical Trial Experience
Dauer LT
Memorial Sloan Kettering Cancer Center

1:50 pm **THPM-B.2**
Emerging Medical Technology Evaluations at the Nuclear Regulatory Commission
*Tapp K, Flannery C**
U.S. Nuclear Regulatory Commission

2:10 pm **THPM-B.3**
Radiation Protection Considerations when Implementing a Mobile Linear Accelerator for an Intraoperative Radiotherapy Program
Young R
IntraOp Medical

THURSDAY

2:30 pm To Report, Or Not To Report, That Is The Question In Radiation Oncology <i>Nitsch PL</i> <i>UT MD Anderson Cancer Center</i>	THPM-B.4	2:15 pm A day in the life of an ECP - Army HP <i>Swanson J</i> <i>US Army</i>	THPM-C.4
2:50 pm BREAK	THPM-B.5	2:30 pm A day in the life of an ECP - Veterinary, University, and Medical <i>Nichols RP</i> <i>University of Missouri</i>	THPM-C.5
3:05 pm New Modalities/Technologies – Coordination with State Regulatory Agencies <i>Gavathas L, Leek A</i> <i>CRCPD</i>	THPM-B.6	2:45 pm Break	THPM-C.7
3:25 pm Shielding Design for Emerging Technologies in Radiation Oncology <i>Martin M</i> <i>Therapy Physics Inc.</i>	THPM-B.7	3:30 pm A day in the life of an ECP - Medical <i>Hinchcliffe B</i> <i>Yale New Haven Medical</i>	THPM-C.8
3:45 pm Installation Personnel: Overlooked in Guidance and Regulations for Linear Accelerator Shielding and Surveys <i>Nimmo EA</i>	THPM-B.8	3:45 pm Interview considerations for the Health Physicist <i>Shaw C</i> <i>WCS</i>	THPM-C.9
4:05 pm BREAK	THPM-B.9	4:00 pm Leadership and Volunteering for ECPs <i>Brackett E</i> <i>MJW</i>	THPM-C.10
4:20 pm Medical Section Business Meeting	THPM-B.10	4:30 pm Roundtable for ECPs <i>Wang C</i> <i>Duke</i>	THPM-C.11

1:30 PM – 5:30 PM

THPM-C

Special Session: Early-Career Professionals

Chair: Rachel Nichols, Charles Wilson

Centennial Ballroom 300C

1:30 pm Early-Career Professional Section - An Update <i>Wilson CA, Nichols RP, Wang C</i> <i>University of Missouri, Duke University</i>	THPM-C.1	5:00 pm Early Career Professional Section Business Meeting	THPM-C.12
1:45 pm A day in the life of an ECP - Environmental, Internal Dosimetry, and Academia <i>Caffrey E</i> <i>Radian Scientific LLC</i>	THPM-C.2		
2:00 pm A day in the life of an ECP - Energy <i>Krage E</i> <i>Energy Harbor</i>	THPM-C.3		

AAHP COURSES

The Davenport Grand • 16 July 2022

8:00 AM - 5:00 PM

AAHP 1

Key Aspects of Radiology and Nuclear Emergency Response and Recovery

Brooke Buddemeier, William Irwin, Angela Leek, Brendan Palmer

This course will provide participants with information and skills that are critical to responding to and recovering from a radiological or nuclear incident. The main topical areas include:

1. Review of the key concepts outlined in the newest Federal guidance documents recently updated for nuclear detonation response.
2. Review and training on key core aspects of the CBRN Responder system for whole community data collection and situational awareness, and introduction of new simulation and data management features,
3. Review of the Radiological Operations Support Specialist program and development of the key aspects of ROSS qualifications, skill development, and integration with state/local jurisdictions.
4. Review and demonstration of the newly developed Virtual Evaluation Scenario Tool (VEST) as a remote opportunity for ROSS to practice skills and apply knowledge in a simulated nuclear detonation response environment.

8:00 AM - 12:00 PM

AAHP 2

Introductory Radiation Epidemiology & Biostatistics

Ashley Golden

Epidemiologic studies of radiation cohorts face many unique challenges from cohort selection to statistical risk modeling approaches and uncertainties. Thus, the purpose of this session is to provide an introductory overview on the methodological and statistical approaches commonly used in radiation epidemiology. This course briefly introduces general epidemiological concepts, study designs, and risk measurements. However, the majority of this course will focus on the analytic decision-making process and risk modeling, including the comparison of Poisson and Cox Proportional Hazards regression techniques, primarily used in radiation epidemiology. The session will conclude with an example of how the concepts are applied for the Million Person Study, a study of chronic low dose radiation in 1 million United States Workers and Veterans.

8:00 AM - 5:00 PM

AAHP 3

FRMAC AS-50 Assessment Science Overview

Lainy Cochran, Brian Hunt

The Department of Energy's Federal Radiological Monitoring and Assessment Center (FRMAC) is an asset comprised of representatives of multiple federal agencies that are available on request to support a response to nuclear/radiological accidents and/or emergencies. The FRMAC works with multiple agencies such as the Environmental Protection Agency (EPA) and the Food and Drug Administration (FDA) to establish consistent radiological dose assessment methods to support public protection guidance provided by the EPA's and FDA's Protective Action Guides (PAG). The revised EPA PAG Manual references the FRMAC Assessment Manual (FAM) for radiological dose assessment methods in support of protective action decisions. This presentation provides an overview of the FRMAC Assessment Manual, describes the default methods for radiological dose assessment, and introduces the Turbo FRMAC software tool that automates these assessment methods.

1. Introduces the FRMAC function, organizational structure and support capabilities, the EPA and FDA Protective Action Guides, the FRMAC Assessment Manual format and tables; Presents several mathematical concepts used in the dose assessment methods; Introduces the software tool, Turbo FRMAC.
2. Presents an overview of the dose assessment methods and mathematical calculations used for Public Protection; Demonstrates the use of the software tool Turbo FRMAC to generate Public Protection dose assessments.
3. Presents an overview of the dose assessment methods and mathematical calculations used for the Ingestion Pathway; Demonstrates the use of the software tool Turbo FRMAC to generate ingestion dose assessments.

PROFESSIONAL ENRICHMENT PROGRAM (PEP)

Sunday, 17 July through Thursday, 21 July • Spokane Convention Center

ONCE AGAIN

The Professional Enrichment Program (PEP) handouts for the Annual Meeting will not be available in hard copy. For those who preregister, you will be provided with an access code for downloading the handouts approximately two weeks prior to the meeting. For those who register for courses on-site, you will be provided the code when you register.

Please note, not all instructors provide downloadable information.

The Professional Enrichment Program (PEP) provides a continuing education opportunity for those attending the Health Physics Society Annual Meeting. The two hours allotted each course ensure that the subjects can be discussed in greater depth than is possible in the shorter programs offered elsewhere in the meeting.

On Sunday, 17 July, a series of 12 courses will be offered between 8:00 AM – 5:30 PM PDT.

In addition to the above-mentioned sessions for Sunday, 10 PEP lectures are scheduled on Monday-Thursday, 12:15 PM – 2:15 PM PDT. Registration for each two-hour course is \$105 and is limited to 60 attendees on a first-come, first-served basis. Those whose registrations are received before the preregistration deadline will be sent confirmation of their PEP course registration.

Students with a current ID card will be admitted free of charge to any sessions which still have space available after the waiting list has been admitted. Student admission will be on a first-come, first-served basis and will only begin 15 minutes after the start of the session to allow for completion of ticket processing.

AAHP is evaluating the number of Continuing Education Credits awarded for each of the PEP (and CEL) courses based on technical content. Course instructors will be able to provide this information at the time of the presentation. This information will also be made available on the AAHP recertification site after data entry is completed.

Please Note!!

In-Person PEPs will be taught in Spokane, WA. All times shown below are Pacific Daylight Time (PDT). Virtual attendees must adjust for their local time. All PEPs will be viewable by either type of paid PEP attendee.

If a PEP is given virtually you will be sent a link to watch the PEP virtually from home or your hotel room. There will NOT be a room on-site at the convention center to watch the PEP.

If a PEP is given in person, you can participate in the course in person or virtually. If you are attending virtually, you will be sent a link to watch it LIVE. If you are attending in person, the course will take place at the Spokane Convention Center.

Please be on time for your sessions. The lecturer will begin promptly at the scheduled time. Please allow time for check-in. The HPS reserves the right to schedule a substitute speaker or cancel a session in case the scheduled speaker is unavailable.

Attendees not present at the starting time of the session cannot be guaranteed a space, as empty spaces will be filled from the wait list at that time. Spaces left after the wait list has been admitted may be filled with students. If your duties at the meeting cause you to be late for your lecture (e.g., chairing a session), contact the PEP registration desk so that your name can be placed on the waiver list and your space held.

Refund Policy

Requests for PEP refunds will be honored if received in writing by 15 June. All refunds will be issued AFTER the meeting. Exceptions will be handled on a case-by-case basis.

Sunday, 8:00am – 10:00am PDT

PEP 1-A Control of Hazards from Ultraviolet Lamps and Arcs

David Sliney

Room 201 AB

Everyone is familiar with the risks posed by exposure to ultraviolet radiation from outdoor sunlight, but the health physicist is sometimes called on to assess the safety of ultraviolet lamps used in forgery detection, insect light-traps, photocuring - and since COVID-19 - germicidal applications. Open-arc sources, such as welding arcs emit both intense ultraviolet and visible light. This PEP course is designed to review UV hazards and aid in clarifying the risks, control measures, exposure limits and measurement techniques for indoor UV sources. The common questions raised with regard to indoor, artificial sources of UV will be addressed. Are different lamps equally hazardous? What are the differences between UV-A, UV-B and UV-C? What are the safety standards and the recognized human exposure limits to UV? What are the acute and chronic effects from UV exposure? What is an “action spectrum,” and why is the wavelength spectral power distribution of the UV source so important? What are the pitfalls in UV source measurement? Do germicidal lamps really pose a serious photocarcinogenic risk when used in an open setting? What is far-UV-C and is it really safer to disinfect occupied rooms? What are the most common UV lamp types? What safety standards exist for indoor sun tanning lamps? Attendees are encouraged to bring their own questions as well.

PEP 1-B Alpha Spectroscopy for the Health Physicist

Mike Clemmer

Room 201 C

This course offers a fast-paced review of the basic principles of alpha spectroscopic analysis for the health physicist. The course includes a review of the nature and origins of alpha-particle emitting radioactivity, basic physics of alpha-particle interaction with matter, considerations and consequences of sample preparation for alpha spectroscopy, alpha spectroscopy system components and calibrations, and a primer on interpretation of alpha spectroscopy data.

PEP 1-C Using the Updated CAP88-PC and STARGET Codes for Estimating Dose and Risk from Chronic Atmospheric Releases

Brian Littleton

Room 202 AB

The U.S. Environmental Protection Agency (EPA) is finalizing a new release of the CAP88-PC model for the National Emission Standards for Hazardous Air Pollutants (NESHAPs) Subpart H compliance demonstration. This new release, Version 4.1.1, fixes a minor error in the recently released Version 4.1, and is accompanied by the STARGET utility which allows for updated meteorology data to be incorporated into the compliance demonstration. CAP88-PC Version 4.1.1 fixes a glitch in the calculation for those radionuclides where previously no data existed for particulate size resulting in an error when running CAP88-PC for these radionuclides in the code. This 2-hour course will help users of CAP88-PC to understand the changes to the model; and demonstrate how meteorological data can be used to update the “.wnd” files needed to run CAP88-PC. The course will also include a brief description of the model and information about the code’s architecture, along with demonstrations on the using the code and the STARGET utility. Additional information on future update paths and regulatory approaches will also be presented.

Sunday, 8:00am – 10:00am PDT

PEP 2-A Nonionizing Radiation: An Overview of Biological Effects and Exposure Limits

Ben Edwards

Room 201 AB

This course provides a fundamental overview of nonionizing radiation (NIR) hazards and biological effects. Course attendees will learn the basic terminology and nomenclature, spectral region designations, regulatory framework, and consensus guidance associated with NIR. The course material will begin at the edge of the ionizing part of the electromagnetic (EM) spectrum and walk participants through a tour of the optical, radiofrequency (including microwave), and extremely low frequency (ELF) portions of the EM range, finally ending with static electric and magnetic fields. The existence of a series of exposure limits covering the entire NIR spectrum forms one of the course’s basic themes. This continuous line of “safe” exposure levels helps establish the concept that NIR dose-response curves are at least well enough understood at all parts of the spectrum to provide a reasonably safe exposure envelope within which we can operate. After completing this course, attendees will be conversant in the major sources and

associated hazards in each part of the NIR spectrum, along with the recognized exposure limits and control measures for those sources. Armed with this information, safety professionals can better recognize, evaluate, and communicate the hazards associated with the spectrum of significant NIR sources and address workers' concerns in a credible, fact-based, knowledgeable, and professional manner. While some knowledge of optical, radiofrequency, ELF, and static electromagnetic field characteristics may be helpful, both experienced and novice health physicists with NIR interests or responsibilities will benefit from this course.

PEP 2-B Gamma Spectroscopy for the Health Physicist

Mike Clemmer

Room 201 C

This course offers a fast-paced review of the basic principles of gamma spectroscopic analysis for the health physicist. The course includes a review of the nature and origins of gamma-emitting radioactivity, basic physics of gamma interaction with matter, consequences of gamma interactions on gamma spectra, gamma spectroscopy system components and calibrations, gamma spectroscopy analysis methods, and interpretation of gamma spectroscopy data.

PEP 2-C Contemporary Topics in Radiation Protection: Ethics and Insider Threat Security Risks

Robert Emery

Room 202 AB

Ethical Decision-Making Tools for Enhancing Organizational Radiation Safety Culture Recent investigations of several tragic events have repeatedly identified the absence of a culture of safety as a common contributing factor. An organization's safety culture is a collective reflection of individual decisions made by its workforce, each carrying with them ethical implications. Safety culture, good or bad, is the sum product of many individual ethical decisions, yet the notion of ethical safety decision-making is not often discussed. This presentation will describe ethical dilemmas radiation safety professionals can encounter, and how the decisions that are made can impact an organization's overall safety culture. A set of ethical decision-making tools will be presented, along with a suggested path forward for actually improving safety culture within an organization. Radiation Safety's Role in Mitigating the "Insider Threat" Security Risk While organizations maintain many layers of controls to prevent outsiders from gaining unauthorized access to cause loss or harm, persons who have been granted legitimate access can become an "insider threat" risk, and because

they are very difficult to detect, cause over \$100 billion in losses annually. Although the typical insider targets assets or data, in some cases their actions can also have significant impacts on workplace and environmental health and safety. Because much of an organization's radiation safety program activities are carried out with the workers in their places of work, this represents a unique opportunity to assist in the possible detection of insider threats. This presentation will discuss the threats represented by insiders and will detail their recognized traits so that radiation safety professionals can enhance their situational awareness and report suspicions to the appropriate authorities.

Sunday, 1:30pm – 3:30pm PDT

PEP 3-A Laser Safety for Health Physicists

Ben Edwards

Room 201 AB

This course provides an overview of laser physics, biological effects, hazards, and control measures, as well as a concise distillation of the requirements in the ANSI Z136.1-2014 Standard for the Safe Use of Lasers. Non beam hazards, emerging issues, and accident histories with lessons learned will also be covered. Course attendees will learn practical laser safety principles to assist in developing and conducting laser safety training, performing safety evaluations, and effectively managing an institutional laser safety program. While some knowledge of laser hazards will be helpful, both experienced and novice health physicists with laser safety responsibilities will benefit from this course. Attendees may find it helpful to bring their own copy of ANSI Z136.1-2014.

PEP 3-B New Pixelated CZT 3D Detection System for Applications in Nuclear Power, Nuclear Research & Medical Imaging

David W Miller

Room 201 C

The state-of-art advancement of CdZxTe gamma cameras launched by the University of Michigan over the past 20 years under the US Department of Defense sponsored research is now in use at over 80% of the US and Canadian nuclear power plants. The H3D CdZnTe gamma cameras verify the adequacy of temporary shielding, contamination control, PWR Crud Burst isotopic mapping and radwaste shipment surveys. The wide adoption of the CdZnTc detector have led to new applications in homeland security, safeguard on nuclear materials as part of the missions of the IAEA and nuclear emergency response. IAEA organized a gamma-ray imaging workshop

and conducted blind test on gamma-ray systems developed by eight different organizations in the world. H3D's pixelated, 3-D, CdZnTe gamma cameras were selected for deployment at IAEA for international nuclear safeguards applications. The position-sensitive, 3-dimensional CdZnTe room temperature semiconductor gamma-ray spectrometers and imagers are being evaluated for medical applications including proton beam therapy dose measurements, PET and radionuclide isotopic imaging. New funding from US DOE for sustainable nuclear technologies to develop spectra software will be discussed.

PEP 3-C Introductory R programming with the 'Radsafer' package

Mark Hogue

Room 202 AB

Health physicists routinely perform computations, but many of us lack tools that help keep these computations accurate and transparent. Some even resort to – gasp – spreadsheets. In this PEP session, you learn how to quickly get started with R programming, using the radsafer package. The radsafer package provides easy-to-use functions in the following categories: radiation measurements, decay corrections, accessing radionuclide data, and tools for MCNP. (The MCNP tools will be reserved to the end of the class since they are of interest only to MCNP analysts.) R can be challenging to learn if starting from scratch. But starting with a package — a documented set of shared code and data designed for your work — makes the transition easier. All software in this course is free and open-source. The class will start with a brief overview of R and Rstudio. Attendees will perform simple computations in the Rstudio console, then run the same computations from the Rstudio source panel. This will transition to writing and saving work as scripts. A brief look at function writing will provide the user insight into the best way to use the functions provided in radsafer. Next, we will explore the radsafer package and try out functions on realistic examples. Many radsafer functions access the RadData package. RadData contains the International Commission on Radiological Protection (ICRP) Publication 107, Nuclear Decay Data for Dosimetric Calculations – one of the data sets used by ORNL's Radiological Toolbox. More details on the packages are provided at github.com/markhogue/radsafer and github.com/markhogue/RadData. Attendees are encouraged to bring laptops, with any common operating system, loaded with the latest versions of R and Rstudio. Installing radsafer (through the Package menu in Rstudio) automatically installs all needed packages such as RadData. Loading R and RStudio is very straight-forward. If desired, a set of instructions to load the programs is located at: www.sthda.com/english/wiki/installing-r-and-rstudio-easy-r-programming.

PEP 4-A Retrospective dosimetry in nuclear forensics

Robert Hayes

Room 201 AB

The physics of thermoluminescence (TL), optically stimulated luminescence (OSL) and electron paramagnetic resonance (EPR) will be reviewed and then shown how these technologies can be used in nuclear forensics, radiological emergency response and epidemiology.

PEP 4-B Calculating Effective Dose and Risk of Cancer from Internal Intake and External Exposure to Radioactive Material

David Stuenkel

Room 201 C

With updated dose coefficients from the International Commission on Radiation Protection (ICRP) for workers and members of the public, and updated cancer risk coefficients to be published in Federal Guidance Report No. 16, there will be updated tools to calculate effective dose and cancer risks from internal intake and external exposure to radioactive material. This Professional Enrichment Program (PEP) provides an overview of the methods used to calculate dose and risk coefficients, highlighting similarities and differences in the two types of coefficients. This PEP provides a discussion of where to find and how to use these coefficients, including examples of how to estimate effective dose and risk from inhalation or ingestion of radioactive material or exposure to radioactive material in the air or on the ground for both acute and chronic intakes and exposures. The PEP also includes a discussion of the different ways to estimate dose and risks for radon-222 and its decay products. This PEP is intended for anyone interested in the calculation of dose and risk coefficients or their application.

PEP 4-C Federal Radiological Response Teams

Kenneth Groves

Room 202 AB

This PEP will offer a review of both Federal and State (Federally Funded) Radiological/Nuclear Emergency Response Teams/Assets. FIRST AND FOREMOST, ALL EMERGENCIES ARE LOCAL (AND AT BEST REGIONAL)! The response times for both Federal and State resources are not fixed; so it is critical that local jurisdictions have planned for the first 24+ hours without outside support. It is critical that 'regional' plans be in place, documented, trained and exercised if your response is to be effective!

PEP M-1 ICRU 95: Operational Quantities for External Radiation Exposur

Nolan Hertel

Centennial Ballroom A

In 2020 the International Commission on Radiation Units and Measurements published ICRU Report 95. The report recommends a new set of operational quantities which are more closely tied to the ICRP protection quantities. The ICRU sphere has been eliminated. In the session the objectives of the report will be presented. The phantoms used in computing the dose conversion coefficients will be discussed. Resulting coefficients for skin dose, eye lens dose, effective dose, and ambient dose will be shown and discussed. Some analysis of the impact of implementing the newly recommended quantities as opposed to using the current set of operational quantities will be discussed. Some time will be carved out for practitioners to discuss the changes.

PEP M-2 Laser Safety the Next Level

Ken Barat

Centennial Ballroom B

The goal of this PEP is to discuss a number of topics not commonly addressed in the traditional/introductory laser safety PEP or laser safety officer training. These topics will be of considerable interest to an LSO whether at a university or research facility (excluding medical facilities). The typical laser safety training course for users or Laser Safety Officers is based on the existing laser safety standards. Because of this several topics are either not touched upon or are represented in a limited format due to restrictions on how standard can address items. This even extends to items covered in the non-normative appendixes of standards. This PEP will include material on the items or elements required to be prepared to respond to a laser accident. Laser safety products that are on the market, both traditional and nontraditional which support laser safety efforts. The class will also include a performance exercise to help engage attendees in demonstrating how laser safety can be obtained and the importance of laser safety officer input. As well as the evaluation of a number of over looked audit items and laser use scenarios. I am quite sure all who attended will leave with useful information and ideas to apply to their place of employment.

PEP M-3 Integration of Health Physics into Emergency Response and Information Communication

Steve Sugarman

Centennial Ballroom C

Response and communication go hand-in-hand. In the event of a radiation incident, it is essential that the radiological situation is properly, yet rapidly, assessed so that a proper response can be planned. Various techniques can be employed to help gather the necessary information needed. It is not always necessary to incorporate wholesale changes to the way things may usually be done in the absence of radioactive materials. For instance, stand-off distances, universal precautions, and response PPE that are normally used can also serve to protect personnel when responding to a radiological event. Coupled with a good event history and other data, health physicists can help to develop a strategy for safely and effectively responding to a radiological event. HP support duties can also include assessment of dose to patients/victims. In addition to performing the “normal” health physics duties, assisting with messaging and communication should be looked at as an area where health physicists can be of help. As time goes on and more information is received, such as specific source term and chemical/physical form of the involved material, bioassay data, plume data, and other additional data, the health physicist will be called upon to interpret that data and communicate the technical information in an understandable manner to people who need it. It is, therefore, essential that health physicists are able to seamlessly integrate themselves into the response environment and effectively communicate their findings to a wide variety of people that may include on-scene command staff, involved victims, medical care providers, public information officers, decision makers, and others.

PEP M-4 Internal Dose Calculations for Nuclear Medicine Applications

Michael Stabin

Centennial Ballroom D

Internal dose calculations for nuclear medicine applications are based on the well-established concepts and units, as defined by the Radiation Dose Assessment Resource (RADAR) Committee of the Society of Nuclear Medicine and Molecular Imaging. The RADAR method harmonized the defining equations and units employed to provide quantitative analysis for both nuclear medicine and occupational internal dose calculations. This program will show, from a practical standpoint, how data are gathered and dose calculations are performed in nuclear medicine applications, showing practical examples

to solve different problems. An overview will be given of the current state of the art in the use of internal dose calculations in nuclear medicine therapy, and the promise for future improvements to provide more patient specificity in calculations (in therapeutic applications) and better ability to predict biological effects from calculated doses. Current developments in radiation biology, particularly bystander effects, that are challenging our interpretation of internal dose calculations in nuclear medicine will also be presented.

Tuesday, 12:15pm – 2:15pm PDT

PEP T-1 The Case Against The LNT

Alan Fellman

Centennial Ballroom D

Radiation safety regulations are based on the linear no-threshold (LNT) hypothesis despite overwhelming peer-reviewed science demonstrating a carcinogenic threshold or hormesis at low doses. LNT insists that lowering a worker dose by as little as one μSv results in a safer workplace. Regulators and radiation safety professionals have convinced most of the public that evacuating 150,000 persons following Fukushima 'saving' them from tens of mSv improves public health when in fact it caused more than 2,000 fatalities among evacuees. Despite compelling evidence revealing LNT to be fraudulent, the consistent response taken by regulatory agencies and scientific bodies whose recommendations are cited as the basis of regulatory actions is to deflect or rationalize away the science or simply pretend it doesn't exist so as to maintain allegiance to a worldview of radiation safety built on ALARA and LNT. A sample of relevant findings supporting this allegation will be presented.

PEP T-2 Performing ANSI Z136-Based Laser Hazard Calculations

Ben Edwards

Room 302 AB

This course provides a step-by-step guide to performing laser hazard calculations based on the principles and methodology in the ANSI Z136.1-2014 Standard for the Safe Use of Lasers. Attendees will gain an understanding of how to complete these calculations for continuous wave, pulsed, and repetitively pulsed laser systems. While some knowledge of laser hazards will be helpful, both experienced and novice health physicists with laser-safety responsibilities will benefit from this course. However, anyone not already familiar with the fundamentals of radiometry and the arcane conventions of the Z136 series of standards for the safe use of lasers would benefit from

attending the Laser Safety for Health Physicists PEP so they'll have some familiarity with the concepts under discussion. Attendees will also find bringing their own copy of ANSI Z136.1-2014 a useful reference.

PEP T-3 Design, Licensing and Commissioning of a New Nuclear Medicine Accelerator Facility

Shaun Kelley

Room 402 C

Nuclear medicine manufacturing is a quickly growing industry with many new facilities being designed, built and commissioned around the US and the world. Many of these facilities are utilizing new types of technology in the quest to deliver new radionuclides, increased yields, and improved efficiencies which can present new and different challenges in facility design, licensing and commissioning, particularly in agreement states with less experience with operations of this scope. Some examples of these new technologies include accelerator, ion source, target designs and more. These challenges dictate that the Health Physicist should get involved in the process as early as possible for proper design and planning in many areas including but not limited to siting, shielding, ventilation, waste storage and more. This lecture will inform attendees of the areas requiring greatest Health Physics attention and effort, pitfalls to be avoided and suggestions for best practices, all based on a successful recent facility commissioning.

Thursday, 12:15pm – 2:15pm PDT

PEP TH-1 Radiation in Flight

Joseph Shonka

Room 302 A

In 2012, measurements of a extreme solar flare that missed earth by 7 days, along with analysis that showed such an event had a 12% probability of occurrence per decade led the US and UK science and technology advisors to recommend a course of action should such an event occur. Unlike the US, carriers in the EU and UK are regulated, and the doses that would have been received exceeded allowable limits. There are no radiation dose limits for US aircrew and passengers. This PEP will summarize the conclusions of those meetings and address both routine and extreme events from radiation that occur in flight. The PEP will also address methods that are being considered to control that radiation routinely and during space weather events. Recent efforts by the ISO to develop standards for measurement of radiation in flight will also be summarized.

PEP TH-2 Radon physics

Robert Hayes

Room 302 B

The basics of radon and thoron physics as they apply to operational health physics as either an interferent to nuclear operations or as an actual health concern as found in uranium minors. The physics of transport and evolution for radon as it effects airborne air contamination measurements including diurnal variation, wind and transuranic activity deconvolution.

PEP TH-3 Technical Basis and Operational Experience for Clearance of Personal Property from SLAC Accelerator Facilities

Manuel Mejias

Room 402 C

At high energy particle accelerators, induced radioactivity in accelerator components or materials can occur as a direct or indirect consequence to exposure to the particle beam and/or the secondary radiation particles due to beam losses. Management of the potentially activated materials is an important part of the radiation protection program. This presentation addresses the release of the materials from radiological control (i.e., clearance of personal property) in accelerator facilities to meet the DOE Order 458.1 requirements. SLAC, a high-energy electron accelerator facility, has successfully released metals for recycle in the past few years. The SLAC material clearance program with its

technical bases are consistent with the DOE Technical Standard DOE-STD-6004-2016 on "Clearance and Release of Personal Property from Accelerator Facilities." The technical bases that support the clearance of metals (e.g., aluminum, iron, steel, copper, and lead) associated operational experience at SLAC are presented. The emphasis of the technical basis is placed on the volumetric radioactivity aspects due to potential activation at high-energy accelerator facilities and the more challenging measurement methods for volumetric radioactivity. The technical basis includes process knowledge (e.g., characteristics of induced radioactivity, proxy radionuclides versus the hard-to-measure radionuclides, and surface maximum activity), measurement protocols (including quantification of detection capability), and a release criterion based on that the release measurements are indistinguishable from background. SLAC has developed and implemented a material management and release program for the material clearance and metal recycling. The program includes the establishment of radiation detection instrumentation and measurement methods to meet the ANSI N13.12 screening level requirements for clearance of accelerator materials. These instruments include portable instruments with sufficient detection capability for survey on material surfaces, field gamma spectrometer for confirmatory measurements, and a portal gate monitor. The discussion will also include best practices for instrument set-up, field measurements, documentation and record management, and communication with stakeholders. A summary of recycling progress, as well as lessons learned will be provided.

CONTINUING EDUCATION LECTURES (CELS)

Monday, 18 July through Thursday, 21 July

CELS will be taught in Spokane, WA. All times shown below are Pacific Daylight Time (PDT). Virtual attendees must adjust for their local time. All CELs will be viewable by either type of paid CEL attendee.

You can participate in the course in person or virtually. If you are attending virtually, you will be sent a link to watch it LIVE. If you are attending in person, the course will take place at the Spokane Convention Center.

AAHP is evaluating the number of Continuing Education Credits awarded for each of the PEP (and CEL) courses based on technical content. Course instructors will be able to provide this information at the time of the presentation. This information will also be made available on the AAHP recertification site after data entry is completed.

Monday, 6:45am – 7:45am PDT

CEL-1 How to Remove and Replace your Cesium Irradiator

Carolyn McKenzie

Centennial Ballroom B

Cesium irradiators represent a liability to the owner due to their potential use as a dirty bomb, the need for enhanced security for their safe housing and the expense of licensing these large sources. There is a policy initiative within the United States to voluntarily eliminate blood irradiation devices that rely on cesium-137 by December 31, 2027. Both blood and research irradiators can now be replaced with x-ray irradiators for both blood and research use in most applications with equivalent results. We will explore the pros and cons of replacement x-ray irradiators for different applications and their primary features will be highlighted. Steps to take to replace your cesium irradiator will be outlined using the Cesium Irradiator Replacement Program (CIRP) to cover part of the cost of the replacement x-ray irradiator. Recommendations for how to work with your research community to gain their buy-in to the use of alternative technologies will be discussed. The use of comparison studies of the old and new irradiator in side-by-side comparison is needed to successfully transition to an x-ray irradiator. Once the comparison studies are completed, removal of the cesium irradiator is available for free under CIRP. What to expect when your Cesium irradiator is planned for removal will be covered

Tuesday, 6:45am – 7:45am PDT

CEL-2 Radiation Protection of the Public and the Environment

Mike Stewart

Centennial Ballroom B

Regulatory agencies have established requirements to protect the public and the environment against undue risk from radiation associated with radiological activities conducted under specified policies. This session will discuss different programmatic aspects to consider when meeting the requirements. Discussion will focus on Department of Energy (DOE) Order 458.1, Radiation Protection of the Public and Environment with comparisons to other Federal Agencies' protection requirements. Covered will be DOE objectives for the protection of the public and the environment which include; conducting radiological activities so that exposure to members of the public is maintained within the established dose limits, controlling the radiological clearance of real and personal property, ensuring that potential radiation exposures to members of the public are as low as reasonably achievable (ALARA), and providing protection of the environment from the effects of radiation and radioactive material. Topics discussed will be public dose limit, ALARA, demonstrating compliance with the public dose limit, airborne radioactive effluents, liquid discharges, radioactive waste, protection of drinking water and ground water, protection of biota, release and clearance of property, and independent verification.

Wednesday, 6:45am – 7:45am PDT

**CEL-3 Establishing a Program to Produce
Ac-225 with a Superconducting Linear Accelerator:
Lessons Learned**

Alexander Bakken

Centennial Ballroom B

Niowave is at the forefront of producing and supplying high-purity Ac-225 in the private sector. Many technical and regulatory hurdles have been overcome to obtain a first-of-a-kind license from the Nuclear Regulatory Commission to process dispersible Ra-226 for the production of Ac-225 using a superconducting linear accelerator. Cancer research in areas such as targeted alpha therapy (TAT) show immense promise with Ac-225 based drugs, however, the existing supply simply cannot match demand. In order to help fill that void, Niowave has spent several years building out radiochemical processing facilities, superconducting linear accelerators, and the surrounding infrastructure to operate a fully functional, closed-loop production system. In this talk, a review of the Ra-226 and Ra-225 (Ac-225) decay chains will be presented. These decay chains possess a complex mixture of radiological hazards. There are alpha, beta, and gamma emissions spanning the range from high to low energy across all particle types, with half-lives varying from microseconds to thousands of years. Even more interesting, is that many of the predominant radiological hazards are dictated by managing a single noble gas, Rn-222, with a half-life of just 3.8 days. With this in mind, the following topics will be presented and discussed: approaches to facility planning and engineering controls, practical methods for detection and identification of contamination, containment and control of Rn-222 gas, real-time spectroscopy techniques for short-lived isotopes, and methods to accurately quantify all isotopes in the respective decay chains.

Thursday, 6:45am – 7:45am PDT

CEL-4 Managing Generally Licensed Devices

Mike Lewandowski

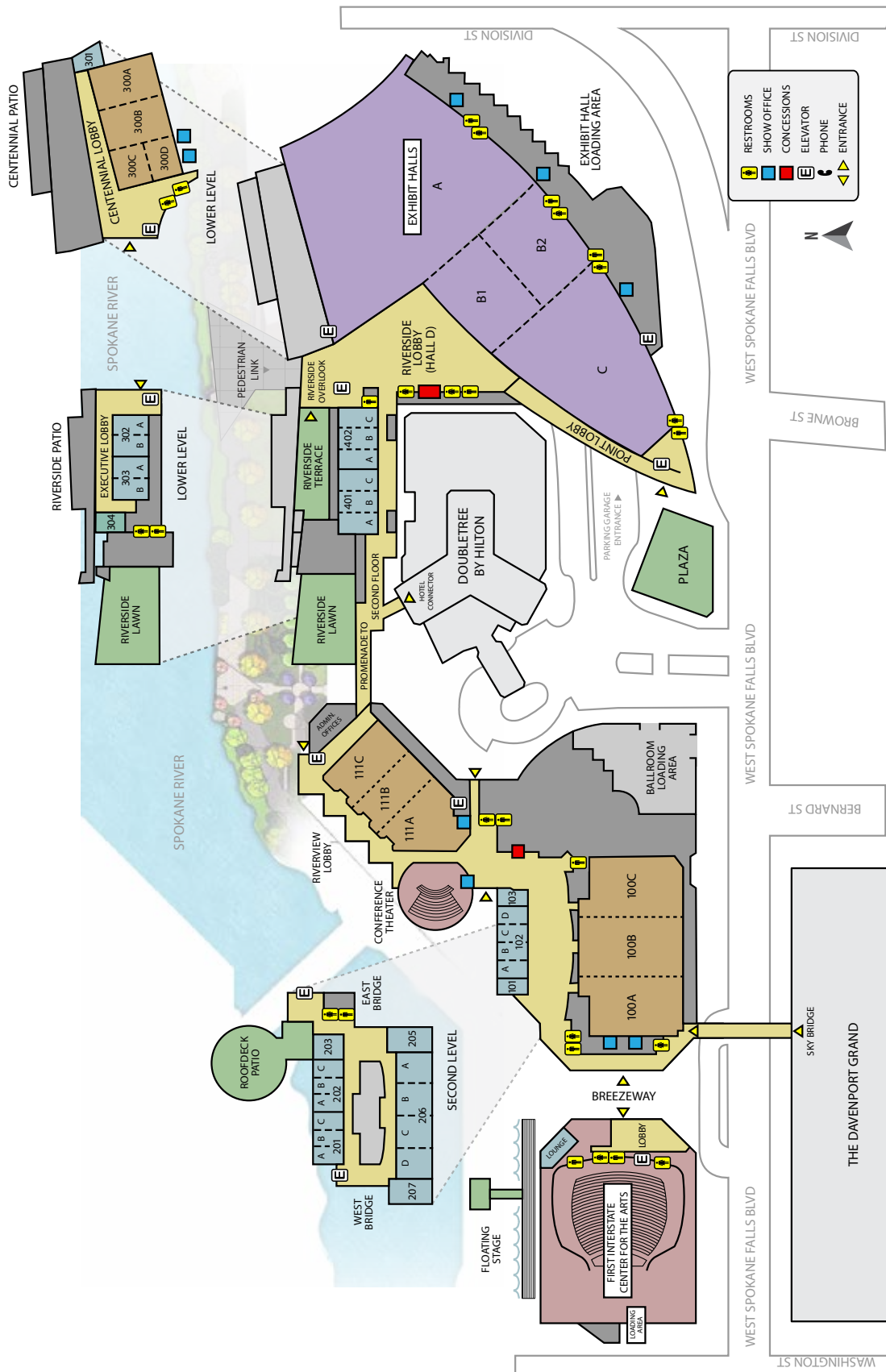
Centennial Ballroom B

Many commercial devices that contain radioactive material for analytical or process control have been determined to present a low hazard and are approved by a regulatory agency for distribution as a generally licensed device. This presentation will review the requirements for end users to use generally licensed devices and provide some suggestions for managing generally licensed devices under a specific license. This presentation builds on a CEL provided at the 2022 IRPA North American Regional Congress and contains additional information. Please note that this presentation is limited to generally licensed devices regulated under 10 CFR Part 31.5 or similar Agreement State regulations.

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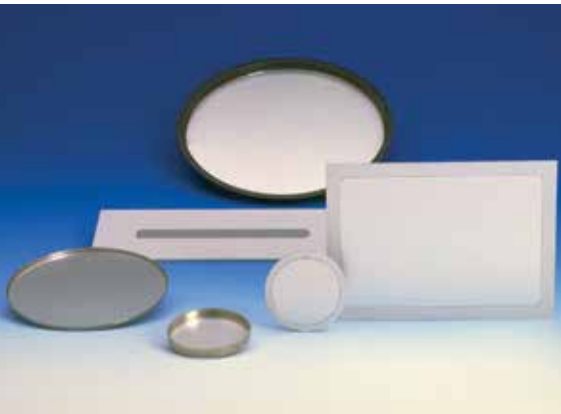
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