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Task Force Chair: Corrin Chlebowy
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The 2017 Midyear Meeting
is presented by the
Health Physics Society
Thank you to our Sponsor:
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Registration Hours
Grand Ballroom Foyer
Sunday 22 January
3:30 PM-5:30 PM
Tuesday 24 January
8:00 AM-3:00 PM
Monday 23 January
7:30 AM-3:30 PM
Wednesday 25 January
8:00 AM-11:30 AM

Exhibit Hours
Grand Ballroom D-H
Monday
Noon-6:30 PM ................. Exhibits Open
Noon-1:00 PM ............ Complimentary Lunch
3:00 PM-3:30 PM .......... Coffee Break
5:00 PM-6:30 PM, .......... Exhibitor Reception/
Poster Reception
Tuesday
9:30 AM-4:00 PM ........ Exhibits Open
10:00 AM-10:30 AM ........ Coffee Break
Noon-1:30 PM ............. Complimentary Lunch
3:00 PM-3:30 PM ........ Coffee Break
### HPS COMMITTEE MEETINGS

All Committee Meetings are in the Bethesda North Marriott Hotel

<table>
<thead>
<tr>
<th>Saturday 21 January 2017</th>
<th>Monday 23 January 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Committee Meeting and Lunch 12:00 pm – 5:00 pm Linden Oak</td>
<td>Companion Orientation 9:00 am – 10:00 am Oakley</td>
</tr>
<tr>
<td>HPS Board Meeting 8:00 am – 5:00 pm Linden Oak</td>
<td>SPIC Meeting 12:30 pm – 1:30 pm Oakley</td>
</tr>
<tr>
<td>AAHP Executive Committee 8:00 am – 5:00 pm Brookside A</td>
<td>Finance Committee Meeting 2:00 pm – 5:00 pm Forest Glen</td>
</tr>
<tr>
<td>Professional Development School Committee 4:00 pm – 5:00 pm Oakley</td>
<td></td>
</tr>
</tbody>
</table>

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**Sunday, January 22**

6:00 pm–7:00 pm

**Welcome Reception**

White Oak AB, lower level

Plan on stopping in for the HPS Welcome Reception. There will be an opportunity to meet friends and to start your evening in Bethesda.

---

**Speaker Ready Room**

Middlebrook

Sunday ............... 2:00 PM – 5:00 PM

Monday ............... 7:00 AM – 5:00 PM

Tuesday .............. 7:00 AM – 5:00 PM

Wednesday ........ 7:00 AM – 10:30 AM

---

**Tuesday 24 January 2017**

**NCRP PAC-2**

1:00 pm – 3:00 pm Oakley

**ANSI 42.17A and B**

1:00 pm – 3:00 pm Strathmore Hall

---

**Tuesday, January 24**

1:00 pm–5:00 pm

**NNSA Demonstration of Radiological Emergency Response Assets**

DOE's National Nuclear Security Administration will host a static demonstration of its radiological emergency response assets available within the National Capital Region and regionally throughout the United States. These include aircraft-mounted radiation detection systems as well as various handheld and mobile radiation detection systems. Assets from a National Guard Bureau Weapons of Mass Destruction Civil Support Team will also be on display.

*Preregistration only, and only open to US Citizens. You must bring valid government ID in order to attend.*
2017 HPS MIDYEAR MEETING EXHIBITORS
Exhibits are located in the Bethesda North Marriott Hotel, Grand Ballroom D-H

Exhibit Hours

**Monday**
- Noon – 6:30 PM: Exhibits Open
- Noon – 1:00 PM: Complimentary Lunch
- 3:00 PM – 3:30 PM: Coffee Break
- 5:00 PM – 6:30 PM: Exhibitor Reception/Poster Reception

**Tuesday**
- 9:30 AM – 4:00 PM: Exhibits Open
- 9:45 AM – 10:30 AM: Coffee Break
- Noon – 1:30 PM: Complimentary Lunch
- 3:00 PM – 3:30 PM: Coffee Break
2017 HPS MIDYEAR MEETING EXHIBITORS
Exhibits are located in the Bethesda North Marriott Hotel, Grand Ballroom D-H

2017 Annual Meeting
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www.hps.org/meetings

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www.flukebiomedical.com

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Ultra Electronics Nuclear Control Systems specialise in the supply of radiation detection systems to the nuclear industry. Product supplied include measurement instruments for the measurement of radioactive concentration in air and liquids. Ultra Electronics Nuclear Control Systems support operating NPP’s, fuel cycle facilities and decommissioning projects in the USA.

Versant Medical Physics and Radiation Safety is a health service support company, focusing on medical physics, radiation safety, and commissioning through expert consultation and training. Our core values are integrity, empowerment, and diligence. We are a woman-owned small business providing services throughout the US.
MONDAY

7:00 AM – 8:00 AM        Grand Ballroom A

CEL-1
Meeting the National Need: An Overview of the DOE Isotope Program
Balkin E

7:00 AM – 8:00 AM        White Flint Ampitheatre

CEL-2
Recent Topics in the Field of Low Dose Radiation Biology
Metting N

8:30 AM – 12:00 PM        Grand Ballroom BC

MAM-A
Plenary Program
HPS in Washington: A Discussion with Key Stakeholders in Health Physics
Chair: Robert Cherry

8:30 AM
Cherry R

8:40 AM        MAM-A.1
Follow the Yellow Brick Road – Radiation Protection and Nuclear Power
Cool DA
EPRI

9:00 AM        MAM-A.2
Your NCRP: Current and Future Activities
Held K, Boice J
NCRP

9:30 AM        MAM-A.3
Commercial Nuclear Power – State of the Industry
Schlueter J
Nuclear Energy Institute (NEI)

10:00 AM        COFFEE BREAK
Ballroom Foyer

11:30 AM        MAM-A.4
NRC’s Re-Evaluation of Category 3 Source Security and Accountability Initiatives
White AD
U.S. Nuclear Regulatory Commission

11:00 AM        MAM-A.5
GAO Report on NRC’s Radiological Materials Licensing Program
Woodward N
US Government Accountability Office

11:30 AM        PANEL DISCUSSION

12:00 PM        LUNCH
Grand Ballroom D-H

1:30 PM – 5:00 PM        Grand Ballroom BC

MPM-A
NCRP Special Session: Nuclear Power and Radiation Protection
Co-chairs: Jerry Hiatt, Kathy Held

1:30 PM        MPM-A.1
The U.S Environmental Protection Agency’s Uranium Fuel Cycle Regulatory Actions
Peake T
US Environmental Protection Agency
1:55 PM  MPM-A.2
NCRP CC-1 – Recommendations on Radiation Protection for the United States
Cool DA
EPRI

2:20 PM  MPM-A.3
RP Implementation of the Prospective Assessment
Harris W
Exelon Nuclear

2:45 PM  PANEL DISCUSSION

3:00 PM  COFFEE BREAK
Grand Ballroom D-H

3:30 PM  MPM-A.4
Implications of Recent Epidemiologic Studies for the LNT Model
Shore R
Radiation Effects Research Foundation (Retired)

3:55 PM  MPM-A.5
Evaluating Cardiovascular Effects
Dauer L
Memorial Sloan Kettering Cancer Center

4:20 PM  MPM-A.6
The One-Million Persons Study of Low-Dose Radiation Effects (MPS): Dosimetry Aspects
Bouville AC
NCRP

4:45 PM  PANEL DISCUSSION

1:00 PM – 4:30 PM  Grand Ballroom A

MPM-B  Risk Analysis
Chair: Ray Johnson

1:00 PM  MPM-B.1
Superposition Analysis of Normalized Gaussians
Hayes R
North Carolina State University

1:15 PM  MPM-B.2
How Decisions for Radiation Safety are Governed by Habit
Johnson RH
Radiation Safety Counseling Institute

1:30 PM  MPM-B.3
US EPA Superfund Radon Vapor Intrusion Preliminary Remediation Goal (RAD-VIPRG) Electronic Calculator
Dolislager FG, Walker SH, Bellamy MA, Galloway LD
The University of Tennessee, US Environmental Agency, Oak Ridge National Laboratory

1:45 PM  MPM-B.4
U.S. EPA Superfund Counts Per Minute (CPM) Electronic Calculator
Dolislager FG, Walker SH, Bellamy MA, Bolus K
The University of Tennessee, US Environmental Agency, Oak Ridge National Laboratory

2:00 PM  MPM-B.5
Why Telling the Truth About Radiation May Not Work
Johnson RH
Radiation Safety Counseling Institute

2:15 PM  MPM-B.6
Acute Radiation Dermatitis
Kindrick S, Camphausen K, Ribaudo C
NIH

2:30 PM  MPM-B.7
Risks from Radon in Homes and Costs for its Control
Pawel DJ, Krop R
U.S. Environmental Protection Agency, The Cadmus Group

2:45 PM  MPM-B.8
Comparing Radiological Risk and Dose Assessment Models of International and National Agencies
Shubayr N, Walker S
U.S. Environmental Protection Agency (EPA)

3:00 PM  COFFEE BREAK
Grand Ballroom D-H
3:30 PM  MPM-B.9
Superfund Evolving Adjustments to External Slope Factors for Risk Assessments
Walker SA, Dolislager FG
U.S. Environmental Protection Agency, University of Tennessee, Oak Ridge National Laboratory

3:45 PM  MPM-B.10
Superfund Update: Revisions to Risk and Dose Assessment Tools
Walker SA, Dolislager FG
U.S. Environmental Protection Agency, University of Tennessee

4:00 PM  MPM-B.11
Assessment of Radium-226 Level on Some Water Samples Collected at Giri and Kuje Area of Abuja, North Central Nigeria
Maxwell O, Wagiran H, Saeed A, Sunday JE, Adewoyin O
Covenant University, Universiti Teknologi Malaysia

4:15 PM  MPM-B.12
Assessment of Natural Radioactivity Levels in the Coal Formation, Enugu, South Eastern Nigeria
Maxwell O, Saeed A, Sunday JE, Adewoyin O, Embong Z
Covenant University, Universiti Teknologi Malaysia, Universiti Tun Hussein Onn Malaysia (UTHM)

5:00 pm - 6:30 pm Grand Ballroom D-H
Exhibitor Reception
Join the exhibitors for food, a cash bar, and the latest in health physics equipment.

5:00 pm - 6:30 pm Grand Ballroom D-H
Poster Session
P.1 Ships and Submarines — A Philatelic Look at Health Physics History
Johnston Thomas P
NIST

P.2 Pitchblende — A Philatelic Look at Health Physics History
Johnston Thomas P
NIST

P.3 Physicians and Radiologists, and Other Contributors to the Health Sciences — A Philatelic Look at Health Physics History
Johnston Thomas P
NIST

P.4 An Assessment of the Potential Association Between in Utero Exposure to Ionizing Medical Radiation and Childhood Leukemia: A Meta-Analysis of Literature, 2001-2015
Ioannidou SP, Smith DA
Georgetown University

P.5 Space Radiation Exposure Simulation During Different Phases of Solar Activity
Paschalis P, Tezari A, Gerontidou M, Mavromichalaki H, Ioannidou SP*
National and Kapodistrian University of Athens, Georgetown University

P.6 Impact of Space Weather on Human Heart Rate During Solar Cycle 24
Ioannidou SP, Galata E, Mavromichalaki H, Gerontidou M, Ntakos G, Paravolidakis K, Benevides L
Georgetown University, National and Kapodistrian University of Athens, Nikaia General Hospital

CEL Courses (Included in registration fee)
To download a CEL talk, use this link and type in the corresponding CEL Code:

http://burkinc.net/HPS2017MYPEP.php

CEL1-8816
CEL2-9865
CEL3-1427
CEL4-2057
CEL5-2411
CEL6-8743
TUESDAY

6:45 AM – 7:45 AM  Grand Ballroom A

CEL-3
Dose Coefficients: What Are They, Where Do They Come From, and How Do We Use Them?
Dewji S
Center for Radiation Protection Knowledge, ORNL

6:45 AM – 7:45 AM  White Flint Ampitheatre

CEL-4
Radioecology 1 – Introduction to Radioecology and Environmental Protection Programs
Condon CA

8:00 AM – 9:15 AM  Grand Ballroom A

TAM-A1
Emergency Planning/Homeland Security
Chair: Jama VanHome-Sealy

8:00 AM  TAM-A1.1
Experiences Developing a Radiation Response Volunteer Medical Reserve Corps Unit
Elder D
University of Colorado Hospital

8:15 AM  TAM-A1.2
The Use of Radioactive Sources for Local Law Enforcement Agency Training
Rubin WM
National Institutes of Health

8:30 AM  TAM-A1.3
An Overview of the Health and Safety Planning Guide for Planners, Safety Officers and Supervisors for Protecting Responders Following a Nuclear Detonation
Scott AL, VanHome-Sealy JD
DHS, OHA, DOD

8:45 AM  TAM-A1.4
Permanently Reducing Risk Through Cesium-137 Irradiator Replacement
Garrison LM
National Nuclear Security Administration

9:00 AM  TAM-A1.5
Communicating Between the Lines: The Need to Effectively Communicating Between Regulatory Limits and Emergency Threshold Model Guidance
VanHome-Sealy JD
US Army Nuclear and Countering WMD Agency

9:30 AM – 11:45 AM  Grand Ballroom A

TAM-A2
Special Session: Government Relations
Chair: Craig Little

9:30 AM  TAM-A2.1
The HPS Government Relations Program and Why It's Good for Society Members
Little CA
HPS Federal Agency Liaison

9:45 AM  TAM-A2.2
NRC/HPS: A Relationship that Informs Radiation Protection
Flannery C
U.S. NRC

10:00 AM  COFFEE BREAK
Grand Ballroom D-H

10:30 AM  TAM-A2.3
HPS Interaction with Congress
Connolly DA
HPS

10:45 AM  TAM-A2.4
Congressional Perspective on Budget and Science Priorities in the 115th Congress and New Administration
Cogliani L
Lewis Burke Associates
**TUESDAY**

11:15 AM  **TAM-A2.5**  
The HPS as a Welcome Stakeholder in EPA's Radiation Protection Program  
Nesky AB, Boyd MA  
U.S. EPA

11:15 AM  **TAM-B.6**  
Can We Change Our Habits to Improve Radiation Risk Communications?  
Johnson RH  
Radiation Safety Counseling Institute

11:30 AM  **PANEL DISCUSSION**

12:00 PM  **LUNCH**  
Grand Ballroom D-H

10:00 AM – 12:00 PM  **Brookside B**

**TAM-B**  
Operational Health Physics  
*Co-chairs: Ray Johnson, Spencer Mickum*

10:00 AM  **TAM-B.1**  
Parametric Study on the Irradiation Field of a High Dose Rate Research Irradiator Design Baseline  
Mickum S, Rushton R, Hope Z  
Hopewell Designs

10:15 AM  **TAM-B.2**  
Engineering Heat Rejection in an Extreme Gamma Environment  
Olszewska-Wasiolek MA, Prevost D, Hanson DJ  
Sandia National Laboratories

10:30 AM  **TAM-B.3**  
Unique Shielding Considerations for a Newly Installed Hot Cell at the National Institutes of Health  
Guarino SN  
National Institutes of Health

10:45 AM  **TAM-B.4**  
Radiological Toolbox 3.0.0  
Dewji S, Hiller M*, Hertel N, Eckerman K  
Oak Ridge National Laboratory, Georgia Institute of Technology, Easterly Scientific

11:00 AM  **TAM-B.5**  
How to Communicate Radiation Risks by Asking Questions  
Johnson RH  
Radiation Safety Counseling Institute

11:15 AM  **TAM-B.6**  
Can We Change Our Habits to Improve Radiation Risk Communications?  
Johnson RH  
Radiation Safety Counseling Institute

11:30 AM  **TAM-B.7**  
Conducting Radiological Surveys Using the Division of Radiation Safety Electronic Survey System  
Voegtli VL  
National Institutes of Health

11:45 AM  **TAM-B.8**  
Enhanced Radiation Protection Measures Against Severe Accidents Based on Lessons Learned from the Fukushima Accident  
Jeon IY  
Korea Institute of Nuclear Safety

12:00 PM  **LUNCH**  
Grand Ballroom D-H

8:00 AM – 12:00 PM  **White Flint Ampitheatre**

**TAM-C**  
Special Session: Medical Health Physics  
*Co-chairs: Cari Borrás, Linda Kroger*

8:00 AM  **TAM-C.1**  
Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards  
Borrás C  
Consultant

8:30 AM  **TAM-C.2**  
Why Is Epidemiology an Important Component of Radiation Protection Standards?  
Shore RE  
Formerly, Radiation Effects Research Foundation and New York University School of Medicine

9:00 AM  **TAM-C.3**  
NRC Patient Safety Culture  
Howe D  
USNRC
TUESDAY

9:30 AM  TAM-C.4  How Have Federal Agencies Used Federal Guidance Report No. 14 to Enhance Their Medical X-ray Programs in Medicine, Dentistry, and Veterinary Practice  
Keith S, Boyd M, Leidholdt E, Bower M  
CDC, EPA, VA, ARMY

8:45 AM  TAM-D.2  Lens of the Eye Dose Considerations for Nuclear Power Plants  
Quinn D  
DAQ, Inc.

9:00 AM  TAM-D.3  Overview of Connecticut Yankee Decommissioning  
Tarzia J  
Radiation Safety and Control Services, Inc.

10:00 AM  COFFEE BREAK  
Grand Ballroom D-H

10:30 AM  TAM-C.5  Organ Doses from Diagnostic Medical Radiography — Trends over Eight Decades (1930 to 2010)  
Melo DR, Miller DL, Chang L, Moroz B, Linet MS, Simon SL  
Melohill Technology LLC, Food and Drug Administration, National Cancer Institute - NIH

9:15 AM  TAM-D.4  Preparing for the SAFSTOR Method of Decommissioning at the Kewaunee Power Station  
Shannon DJ  
Dominion

11:00 AM  TAM-C.6  Tracking and Estimating Organ Doses in Radionuclide Imaging  
Thomas J  
Via Christi Health

11:30 AM  TAM-C.7  FDA Efforts to Improve the Safety of Radiological Medical Imaging Devices and Radiation Emitting Electronic Products  
Ochs RA  
FDA/CDRH

12:00 PM  LUNCH  
Grand Ballroom D-H

8:30 AM – 12:00 PM  Grand Ballroom BC

TAM-D  
NCRP Special Session: Nuclear Power and Radiation Protection  
Co-chairs: Don Cool, Larry Dauer, Michael Corradini

8:30 AM  TAM-D.1  Electric Power Research Institute Research Related to Radiological Environmental Protection at Nuclear Power Plants  
Kim K  
Electric Power Research Institute

11:00 AM  TAM-D.7  Delivering the Nuclear Promise: Advancing Safety, Reliability, Economic Performance and Radiation Protection Efficiencies  
Anderson E  
NEI

11:25 AM  PANEL DISCUSSION

11:50 AM  SUMMARY

12:00 PM  LUNCH  
Grand Ballroom D-H
TPM-A1
External/Internal Dosimetry and Bioassay
Co-chairs: Shaheen Dewji, Ricardo Reyes

1:30 PM - 3:15 PM  Grand Ballroom BC

TPM-A1.1
Room Submersion Calculations of Noble Gas Dose Rate Coefficients
Y-12 National Security Complex, Oak Ridge National Laboratory, Easterly Scientific, Georgia Institute of Technology

1:45 PM - 2:00 PM  Grand Ballroom BC

TPM-A1.2
DoD Biodosimetry Network: Gap Identified and Justification for Proposed Network
Reyes RA
DHS

2:00 PM - 2:15 PM  Grand Ballroom BC

TPM-A1.3
Comparison of Organ Doses for PIMAL Stylized Phantoms in Upright and Bent Positions for Various Irradiation Geometries
Reed L, Dewji S*, Hiller M
Georgia Institute of Technology, Oak Ridge National Laboratory

2:15 PM - 2:30 PM  Grand Ballroom BC

TPM-A1.4
Declared Breastfeeding Worker Program
Fisher TE
National Institutes of Health

2:30 PM - 2:45 PM  Grand Ballroom BC

TPM-A1.5
Methodology to Compare the Relative Protection of Total Body and Effective Dose Limits
Littleton B, Marschke S
US Environmental Protection Agency, S. Cohen & Associates

2:45 PM - 3:00 PM  Grand Ballroom BC

TPM-A1.6
A 3D-Printing Method for the On-Demand Fabrication of Patient-Specific Anthropomorphic Phantoms with Multiple Tissues Represented
Mille MM, Kuzmin G, Zimmerman BE, Lee C
National Institutes of Health, National Institute of Standards and Technology

3:00 PM - 3:15 PM  Grand Ballroom BC

TPM-A1.7
Impact of Body Size on Dosimetry Calculations in Nuclear Medicine: The Need for Size-Dependent Computational Phantoms
National Institutes of Health, University of California, San Francisco

3:30 PM - 5:00 PM  Grand Ballroom BC

TPM-A2.1
Hopewell Designs Calibration Workshop
Hopewell Designs, Inc. (HDI) is offering a workshop on the calibration of irradiator. Training on calibration encompasses the calibration procedures, data acquisition, uncertainty estimation, and presentation of results. This workshop is designed as a short course to cover the basics of system calibration performed by using a NIST traceable measurement device to record the exposure from radiation source, for free-air or self-contained irradiator. Such calibration service employs a suite of measurement equipment annually certified and traceable to the National Institute of Standards and Technology (NIST) and accredited to the ISO/IEC 17025:2005. Measurements of the absolute or relative exposure can be made over a series of distances for combinations of sources, filters, collimators and attenuators. Measurement results are reported in units traceable to the International System of Units (SI).

Quantitative indications of the quality of calibration results are discussed along with the measurement results to assess their reliability. Each presented measurement result is accompanied with a statement of uncertainty adhering to the Guidance on the Expression of Uncertainty in Measurement. Attention will be paid to quality assurance procedures so traceability at the lowest uncertainty is maintained. All data collected adheres to the recommendations of ANSI323AB-2013 for measurement uncertainty and reproducibility.

This workshop will last approximately 1.5 hrs and is free of charge for all attendees of the 50th Health Physics Society Midyear Meeting.
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<thead>
<tr>
<th>Time</th>
<th>TPM-B1</th>
<th>Grand Ballroom A</th>
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<tbody>
<tr>
<td>1:30 PM</td>
<td>TPM-B1.1  Creating Hidex 300 SL Triple Label Quench Curves</td>
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<td>National Institutes of Health</td>
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<td>1:45 PM</td>
<td>TPM-B1.2  Experimental Validation of Secondary Neutron Dose from TOPAS with Bubble Detectors</td>
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<td>Kuzmin GA, Mille MM, Thompson A, Lee C</td>
<td>National Cancer Institute, National Institute of Standards and Technology</td>
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<td>2:00 PM</td>
<td>TPM-B1.3  Technology Developments in Monitoring Radiological Incidents in the Environment</td>
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<td>Menge JP</td>
<td>Bertin Corp</td>
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<td>2:15 PM</td>
<td>TPM-B1.4  Drone UAV Instrumentation Selection Criteria</td>
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<td>Menge JP</td>
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<td>2:30 PM</td>
<td>TPM-B1.5  Dose Calibrators-Measurements and Quality Assurance</td>
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<td>Yusko MA</td>
<td>Capintec, Inc.</td>
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<td>2:45 PM</td>
<td>TPM-B1.6  A Very Portable In-situ Gamma Spectrometer with Collimated CZT Detector</td>
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<td>Bronson F, Muller W, Zickefoose J, Herman C</td>
<td>Canberra</td>
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<td>3:00 PM</td>
<td>COFFEE BREAK</td>
<td>Grand Ballroom D-H</td>
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<th>Time</th>
<th>TPM-B2</th>
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<tr>
<td>3:45 PM</td>
<td>TPM-B2.1  The United States Nuclear Regulatory Commission</td>
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<td>Radiation Protection Computer Code Analysis and Maintenance Program</td>
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<td>Bush-Goddard S, Nguyen M</td>
<td>Nuclear Regulatory Commission</td>
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<td>4:00 PM</td>
<td>TPM-B2.2  NRC Evaluation of the Radioactive Source Security Regulations in 10 CFR Part 37</td>
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<td>Cervera M, White D</td>
<td>U.S. Nuclear Regulatory Commission</td>
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<td>4:15 PM</td>
<td>TPM-B2.3  Priorities for 2017-2021 Term of the International Commission on Radiological Protection</td>
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<td>Clement CH</td>
<td>ICRP</td>
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<td>TPM-B2.4  Medical Use Of Radiation Is Different — How Do NRC Regulations Reflect This Difference</td>
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<td>Langhorst SM</td>
<td>Washington University in St. Louis</td>
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<td>4:45 PM</td>
<td>TPM-B2.5  Medical Use of Radiation is Different — NRC Limitations in Balancing Medical Benefit with Radiation Risk</td>
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<td>Langhorst SM</td>
<td>Washington University in St. Louis</td>
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<td>5:00 PM</td>
<td>TPM-B2.6  Introduction of HABIT v2.0 Code</td>
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<td>Sun C, Spicer T, Lam K, Haider S</td>
<td>U.S. Nuclear Regulatory Commission, University of Arkansas, Leidos Companies</td>
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TUESDAY
5:15 PM TPM-B2.7
Radiation Protection Challenges in the United Arab Emirates (UAE): A Call for National Action Agenda
Al Husari Z, Ajaj R*
Federal Authority For Nuclear Regulation - UAE

2:30 PM TPM-C.3
The Evolving Role of the Physicist in Assuring Radiation Therapy Quality and Safety
Williamson J
University of Virginia

1:30 PM – 5:00 PM White Flint Ampitheatre

TPM-C
Special Session: Medical Health Physics
Co-chairs: Cari Borrás, Linda Kroger

1:30 PM TPM-C.1
The Impact of Regulations on Patient Care
Conley TA
The University of Kansas Hospital

2:00 PM TPM-C.2
Establishing Medical Imaging Acquisition Protocols
Mahadevappa M
Johns Hopkins University

3:00 PM COFFEE BREAK
Grand Ballroom D-H

3:30 PM TPM-C.3
The Evolving Role of the Physicist in Assuring Radiation Therapy Quality and Safety
Williamson J
University of Virginia

4:00 PM TPM-C.5
The Role of the Radiation Safety Officer in a Medical Environment
Kroger LA
UCDavis Med Center

4:30 PM DISCUSSION

Call for Papers
Health Physics Society 62nd Annual Meeting & Exhibition
9-13 July 2017 - Raleigh, NC

The deadline for submitting abstracts for the 2017 Annual Meeting is 10 February 2017.

Please submit your abstract (including Special Session abstracts!) through the HPS website, http://hpschapters.org/2017AM/abstracts

Submittal and Presentation guidelines can be found at http://hps.org/meetings
WEDNESDAY

6:45 AM – 7:45 AM  Grand Ballroom A

CEL-5
Radiological Toolbox 3.0.0
Dewji S, Hiller M
Center for Radiation Protection Knowledge, Oak Ridge National Laboratory

6:45 AM – 7:45 AM  White Flint Ampitheatre

CEL-6
Radioecology 2 – Dose to Biota
Neville DR

8:00 AM – 11:00 AM  Grand Ballroom BC

WAM-A1
Special Session: Military Health Physics
Co-chairs: MAJ Thomas Rezentes, LTC Harry Stewart

8:00 AM  WAM-A1.1
US Air Force Health Physics in 2017
Nemmers S
US Air Force

8:15 AM  WAM-A1.2
US Army Health Physics
Cuellar J
US Army

8:30 AM  WAM-A1.3
Navy Radiation Health Program and Community
Williams A
US Navy

8:45 AM  WAM-A1.4
Changing the Permitting Agency for Use of Radioactive Materials
Stewart HM

9:00 AM  COFFEE BREAK
Grand Ballroom Foyer

9:30 AM  WAM-A1.5
Revising the Approach: Taking a Total Risk Perspective When Recommending an Operational Exposure Guideline
VanHorne-Sealy JD
US Army Nuclear and Countering WMD Agency

9:45 AM  WAM-A1.6
Health Physics Considerations During Processing of Radiologically Contaminated Human Remains
Frey JJ, Livingston BE, Falo GA
20th CBRNE Command, Army Public Health Center

10:00 AM  WAM-A1.7
DoD Biodosimetry Network
Reyes RA, Rezentes TB, Stewart HM, Blakely WF, Romanyukha A, Subramanian U, Hoefer M, Romanyukha L, Mendez M, Boozer D

10:10 AM  WAM-A1.8
Radiation Dose Assessment by Electron Paramagnetic Resonance and Whole-Body Counting at the Naval Dosimetry Center
Romanyukha A, Reyes RA*, Blakely WF, Grypp MD, Williams AS, Sharp T
Naval Dosimetry Center, Department of Homeland Security, Armed Forces Radiobiology Research Institute

10:25 AM  WAM-A1.9
Dose Assessment by Multiple Parameter Biodosimetry at AFRRI — DoD Biodosimetry Network
Blakely WF, Subramanian U, Romanyukha L, Mendez M, Hoefer M
Armed Forces Radiobiology Research Institute

10:45 AM  WAM-A1.10
Large Scale Emergency Dosimetry Based on Epr Spectroscopy: Evaluation of Q-band EPR on Tooth Enamel Mini-Biopsies
Trompier F, Romanyukha A, Reyes RA*
Institut de Radioprotection et de Sûreté Nucléaire, Fontenay-aux-Roses, France, Naval Dosimetry Center, Uniformed Services University of the Health Sciences
WEDNESDAY

11:15 AM – 12:00 PM Grand Ballroom BC

WAM-A2
Medical Health Physics
Chair: Mehdy Jabir

11:15 AM WAM-A2.1
A Practical Approach to the Radiation Safety of Implanted Cardiac Devices in Patients Receiving External Beam Radiation Therapy
Jabir M
VA Medical Center

11:30 AM WAM-A2.2
Normal Tissue Dose During Breast Cancer Radiotherapy Treatments
National Institutes of Health, University of Michigan

11:45 AM WAM-A2.3
Real Time Visualization of High Dose Rate Brachytherapy
Sandwall P, Handley J, Greene C, Spitz H
TriHealth Cancer Institute, University of Cincinnati, Canberra Industries

9:00 AM – 10:00 AM Grand Ballroom A

WAM-B2
EPA Panel
Co-chairs: Amanda Anderson, Stuart Walker

9:00AM WAM-B2.1
US Environmental Protection Agency (EPA) and US Department of Energy (DOE) Panel on the Use of Risk and Dose Assessment Tools
Anderson A, Walker S
US DOE, US EPA

10:00 AM
COFFEE BREAK
Grand Ballroom Foyer

10:30 AM – 11:45 AM Grand Ballroom A

WAM-B3
Environmental
Chair: James Menge

10:30 AM WAM-B3.1
Citizen-based Environmental Radiation Monitoring Network
Alemayehu B, McKinzie MG
Natural Resources Defense Council

10:45 AM WAM-B3.2
Simple Slides Can Explain Safety of Nuclear Waste Disposal
Brodsky A
Georgetown University

11:00 AM WAM-B3.3
Long-lived Airborne Gamma-emitting Particulate Radioactivity in the United States
Lowry RC
US EPA

11:15 AM WAM-B3.4
Major Oxide Compositions and its Impact on Radioactivity on Some Rocks Obtained at Varying Depths in Abuja, North Central Nigeria
Maxwell O, Sunday JE, Saed A, Adewoyin O, Embong Z
Covenant University, Universiti Teknologi Malaysia, Universiti Tun Hussein Onn Malaysia (UTHM)

8:00 AM – 8:45 AM Grand Ballroom A

WAM-B1
History
Chair: Mike Mahathy

8:00 AM WAM-B1.1
The Colonel, the Captain, and the Commander
Johnston TP
NIST

8:15 AM WAM-B1.2
Review of Radiation Exposure Aboard USS Nautilus, 1955-1956
Johnston TP
NIST

8:30 AM WAM-B1.3
The Future of HPS Meetings — An Update
Mahathy J, Brackett E
ORAU, MJW Corporation
WEDNESDAY

11:30 AM  WAM-B3.5
Methodology for Determination of Radon Soil
Concentration
Menge JP
Bertin Corp

9:30 AM  WAM-C1.6
State University of New York at Buffalo Materials
Research Center Decommissioning Project
Clements JP, Watson BA, Smith TB
US NRC

9:45 AM  COFFEE BREAK
Grand Ballroom Foyer

10:15 AM  WAM-C1.7
Veterans Affairs Omaha Research Reactor
Decommissioning Project
Giebel S, Conway K, Schlapper G
US NRC

11:00 AM – 11:30 AM  White Flint Ampitheatre

WAM-C1
Special Session: Research Reactor
Decommissioning
Chair: Bruce Watson

8:15 AM  WAM-C1.1
The Regulator’s View for Successful Research Reactor
Decommissioning
Watson BA, Smith TB, Hickman JB
US NRC

8:30 AM  WAM-C1.2
University of Arizona Research Reactor
Decommissioning Project
Giebel S, Hickman J, Watson BA
US NRC

8:45 AM  WAM-C1.3
Worcester Polytechnic Institute Decommissioning
Project
Watson BA, Roberts M, Kurian V, Smith TB
US NRC

9:00 AM  WAM-C1.4
University of Michigan Ford Research Reactor
Decommissioning Project
Giebel S, Smith TB
US NRC

9:15 AM  WAM-C1.5
University of Illinois Research Reactor
Decommissioning Project
Watson BA, Hickman JB
US NRC
AAHP Course #1
ANSI N13.1, Nuances, Facts and Fiction
Brent Blunt
Location: Glen Echo

American National Standard Institute (ANSI) N13.1 provides the basic criteria for sampling of radiological emissions for stacks and vents. Older plants utilize the 1969 version, while newer plants and some plants with modifications are required to upgrade to the 1999/2011 version of the Standard (the 1999 version of the Standard was reaffirmed in 2011). The 1999 version of the Standard was a major rewrite and incorporates a performance-based approach to sampling. After 17 years of implementing the revised Standard, there are numerous nuances that have come to light and there are several ideas about implementation that are fiction. This course will cover the basics of collecting a representative sample from stacks and ducts using the 1999/2011 version of ANSI N13.1. In addition, the subjects of how the Standard applies to off-normal or accident releases will be addressed and how to upgrade a 1969 compliant system to the 1999 version.

AAHP Course #2
Radiation Risk Assessment
Fred Dolislager (The University of Tennessee)
Stuart Walker, (EPA Office of Superfund Remediation and Technology Innovation)
Location: Forest Glen

Radiation Risk Assessment is a full-day advanced course that focuses on specific technical and regulatory issues that Remedial Project Managers (RPMs) and On-Scene Coordinators (OSCs) address when managing Superfund sites that have a risk assessment conducted for radioactive contaminants. By taking the course, participants achieve the following objectives:

- Learn a step-by-step approach to the Superfund remedial program’s risk assessment process for radioactive contamination. The course discusses the major steps in Superfund remedial program’s risk assessment for radioactive contamination and the EPA recommended guidance documents and calculators and or models for conducting such risk assessments.

- Explore methods for conducting site-specific risk assessments. The course examines how to alter the default input parameters in the Superfund remedial program’s risk calculators.

- Discover practical recommendations for improving the radiation risk assessments conducted at your site. The course stresses some obvious and other less obvious aspects helpful in improving the radiation risk assessment process.

- Master information about the radiation risk assessment process. Participants obtain information from experienced professionals about the radiation risk assessment process.

The instructional methodology for this course includes lectures and demonstrations of using EPA’s risk and dose assessment calculators developed by the Superfund remedial program. The target audience for this course is RPMs, OSCs, risk assessors and others that want to obtain a working knowledge on conducting Superfund radiation risk assessments.
1-A Emergency Response Training for First Responders Made Simple; the Department of Energy's MERRTT - Part 1

T. Clawson and M. Linsley
Technical Resources Group, Inc.

Location: Salon A

Excellent materials exist for training first responders (firefighters, HAZMAT, law enforcement, emergency medical technicians, etc.) on how to respond to a transportation incident involving radioactive material. Participants who successfully complete the PEP 1-X, 2-X, and 3-X sessions will be certified to teach materials contained in the Department of Energy’s Transportation Emergency Preparedness Program’s Modular Emergency Response Radiological Transportation Training (MERRTT).

The full MERRTT is a 16-hour program consisting of multimedia rich training material that includes PowerPoint presentations, videos, practical exercises, student guides, instructor guides, test material, and regionally available training aids. MERRTT takes the complex topic of a radiological accident response and breaks it down into 16 easily understood modules and hands-on practical exercises. Attendees of a MERRTT program are presented with information that simplifies the topic while developing a comprehensive understanding of radioactive material, radiological survey instruments, and decontamination techniques for handling radiologically contaminated victims and resources available to responders during a response. An important element of the training is detailed information on the types of packages used to transport radioactive material. The course includes use of exempt-level radiation sources in the practical exercises to reinforce learning. Upon successful completion of the MERRTT course, students receive a certificate from the Department of Energy’s Transportation Emergency Preparedness Program, including up to 10.5 hours of continuing education hours (CEH) for medical response personnel. MERRTT also meets the Waste Isolation Project Plant (WIPP) Land Withdrawal Act training requirements and is listed on the Department of Homeland Security’s federally approved courses listing.

This session will be a summary of the program and an initial review of the PowerPoint presentations. Attendees will need to complete all three sessions (1-A, 2-A, and 3-A) to receive their instructor certification and DVD of the course material.

1-B RESRAD Dose and Risk Assessment Methodology for Humans, Flora, and Fauna – Part 1: RESRADONSITE Code for Human Dose and Risk Assessment

C. Yu

Location: Salon B

The RESRAD Family of Codes is a suite of software tools developed by Argonne National Laboratory for the US Department of Energy (DOE) and US Nuclear Regulatory Commission (NRC). RESRAD family of codes is the industry standard in evaluating contaminated sites. It has been used by health physicists and radiological engineers as a tool for deriving cleanup criteria and radiological dose and risk assessment for releasing contaminated sites. RESRAD family of codes has been widely used in more than 100 countries. It has been applied to numerous sites and over 1000 journal and other papers have been published either based on or citing RESRAD codes. Applications of RESRAD codes include derivation of cleanup criteria, evaluation of remediation alternatives, radiological dose and risk assessment for humans, biota dose assessment, waste disposal facility performance assessment, and emergency response to nuclear incidents. This 3-part PEP is designed to cover dose and risk assessment for humans (Part 1) and nonhuman biota (Part 2), and comparison of RESRAD to Environmental Protection Agency’s (EPA’s) PRG and DCC Calculators used for CERCLA sites (Part 3). It is recommended to take 3 parts in sequence, but each part is designed so that it is a stand-alone session with minimal overlapping with other parts.

Part 1: Presents an overview of the RESRAD Family of codes and the methodology used in RESRAD-ONSITE code for human dose and risk assessment. The pathway analysis methodology will be discussed in detail. The parameters and data required in dose analysis, including dose coefficients and risk slope factors will be discussed. The verification and validation of the RESRAD codes will also be presented.
1-C   Update to U.S. DOT Regulations  
S. Austin  
Plexus Scientific  
Location: Salon C  
The harmonization of domestic and international standards for hazardous materials transportation enhances safety by creating a uniform framework for compliance. Harmonization also facilitates international trade by minimizing the costs and other burdens of complying with multiple or inconsistent safety requirements and avoiding hindrances to international shipments. Harmonization has become increasingly important as the volume of hazardous materials transported in international commerce grows. The U.S. Department of Transportation (DOT) amended the Hazardous Materials Regulations to incorporate changes adopted in the 2009 Edition of the IAEA Safety Standards publication titled “Regulations for the Safe Transport of Radioactive Material, 2009 Edition.”  
These changes to DOT regulations affect the packaging and transportation of radioactive material. The changes impact marking of packages, reporting of total activity in a package, placarding of certain shipments of LSA-I and SCO-I materials, several key definitions, shipping paper retention requirements, surveys, labeling, and assessment of radiation hazards from packages or conveyance that have been suspected to leak radioactive material. Organizations that are offering packages of radioactive material for transport or transporting these materials need to be aware of these changes and incorporate them into their existing shipping program.

2-B   RESRAD Dose and Risk Assessment Methodology for Humans, Flora, and Fauna  
-- Part 2: RESRADBIOTA Code for Biota Dose Assessment  
S. Kamboj, C. Yu, and K. McLellan  
Location: Salon B  
Please see PEP 1-B for the introduction. Part 2 presents the RESRAD-BIOTA code, a biota dose assessment tool designed for demonstrating compliance with the dose rate criteria set in DOE Order 458.1. The development of RESRAD-BIOTA code was sponsored by DOE, with support from NRC and the US Environmental Protection Agency. The RESRAD-BIOTA code provides a complete spectrum of biota dose evaluation capabilities, ranging from generic screening to comprehensive receptor-specific dose estimation. The DOE graded approach methodology and its implementation in the RESRAD-BIOTA code will be demonstrated with examples. The advanced analysis capabilities in RESRAD-BIOTA code, including geometry-based dose coefficients, organism wizard, food chain model, and sensitivity and probabilistic analysis, etc., will be discussed.

2-C   A Forgotten Nuclear Accident — Bravo  
C. Sun  
Location: Salon C  
This is a PEP presentation based on decades of personal experience from managing the Marshall Islands Radiological Safety Program (MIRSP) at Brookhaven National Laboratory (BNL). It starts with the selection of Bikini Island for the US Pacific Test Ground in the Republic of Marshall Islands (RMI). Later, on March 1st 1954, the Bravo detonated. Since then, Bikini has never be the same — space and the people. The catastrophic event was resulted (1) from unpredicted weapon yields and (2) by the nuclear debris and fallout reached to the east of many inhabited Atolls. BNL scientists played an important role on the radiological health and medical care of exposed populations funded by the Department of Energy (DOE) for about 40 years. The MIRSP was established for bioassay monitoring and internal dose assessment. The overview will explain the dose assessment methods include whole-body counting, urinalysis and LLNL’s environmental and diet/intake studies. Finally, the presentation summarized and analyzed the operational activity as lesson learned that could applied and implemented to modern emergency planning and accident preparedness.
2-D Fundamentals of Alpha Spectroscopy  
B. Davis  
Location: Glen Echo

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.

Sunday 2:00 PM – 4:00 PM

3-A Emergency Response Training for First Responders Made Simple; the Department of Energy’s MERRTT Train-the-Trainer Program – Part 3  
T. Clawson and M. Linsley  
Technical Resources Group, Inc.  
Location: Salon A

Please see PEP 1-A for a full description of this 3-part program. This session will include a review of the two of five remaining hands-on practical exercises, a 25-question test required for completion of the MERRTT Train-the-Trainer program, and a review of the administrative issues involved in hosting and a completing the DOE’s MERRTT program. Attendees will need to complete all three sessions (1-A, 2-A, and 3-A) to receive their Instructor certification and DVD of the course material.

3-B RESRAD Part 3 RESRAD Dose and Risk Assessment Methodology for Humans, Flora, and Fauna -- Part 3: Comparison of RESRAD-ONSITE and EPA PRG and DCC Calculators  
J. Cheng, S. Kamboj, and C. Yu  
Location: Salon B

Please see PEP 1-B for the introduction. Part 3 presents the RESRAD-ONSITE code, which is used by both DOE and NRC for deriving cleanup criteria or Derived Concentration Guideline Levels (DCGLs) for radioactively contaminated sites. EPA recommends using the Preliminary Remediation Goal (PRG) and Dose Compliance Concentration (DCC) Calculators for CERCLA sites. Understanding the similarity and differences between RESRAD-ONSITE and PRG/DCC Calculators is essential in selecting the appropriate tool for evaluation of contaminated site. This PEP provides an overview of the modeling approach of these three software tools and discusses the key differences in the modeling assumptions, formulations, default parameter values, and their influence on the calculated results.

3-C “Hey, Why Do We...”  
C. Ribaudo and M. Roberson  
Location: Salon C

This class will be a compilation of skill-testing questions in a quiz format for broad scope licensees to assess their understanding of why certain radiation safety practices are in place. The correct answers are provided along with the NRC regulatory citation so that Radiation Safety Officers and other operational health physicists can have a working knowledge of the regulatory basis for certain — perhaps quirky — requirements. There’s more to the rationale (in most cases!) in why we do things besides “We’ve always done it this way!” It is hoped that questions and answers will generate useful discussion amongst participants and lead to a better understanding of regulatory requirements. A disclaimer from the authors that this class does not substitute as formal guidance from your NRC or State regulatory authority.

3-D Fundamentals of Gamma Spectroscopy  
B. Davis  
Location: Glen Echo

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.

3-E Health Physics Response: Emergency Response versus Occupational Response  
B. Haley  
Location: Forest Glen

How Health Physics during a response is different than in an occupational setting. This will be a thoughtful discussion using operational problems to discuss/demonstrate how decision timelines and processes are very different during an emergency than in the work setting. The discussion will focus on integrating health physicists into emergency response organizations and processes.
### Monday 7:00 AM – 8:00 AM

**CEL-1 Meeting the National Need: An Overview of the DOE Isotope Program**  
*E. Balkin*

**Location:** Grand Ballroom A

The DOE Isotope Program fills a critical need within the US as a supplier of stable and radioisotopes in short supply for the medical, research, industrial, and governmental communities. This talk will provide an overview of the program, its mission, and accomplishments.

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**CEL-2 Recent Topics in the Field of Low Dose Radiation Biology**  
*N. Metting*

**Location:** White Flint Amphitheatre

The field of low dose radiation biology focuses on biological responses to radiation exposures that are at or near current workplace exposure limits. It was not until the advent of molecular biology that low dose effects could even be measured. Until recently, most molecular studies of radiation effects were carried out using an isolated cell type in monolayer culture, and the responses of those cells were then extrapolated to mammalian tissues and whole organisms. New research indicates that fundamentally different cellular and molecular responses can occur as a function of the level of biological organization (cells, tissues, whole organisms), and that normal, intact tissue responds, in general, differently to radiation than do single cells or monoculture cell populations. Responses of special interest include radio-adaptive responses, systems genetics of inter-individual variation, and low dose and/or low dose-rate effects on proteomic and metabolic responses, the immune system, and epigenetic regulation. Recent progress on several of these topics will be presented.

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### Tuesday 6:45 AM – 7:45 AM

**CEL-3 Dose Coefficients: What are they, where do they come from, and how do we use them?**  
*S. Dewji*

**Center for Radiation Protection Knowledge, ORNL**

**Location:** Grand Ballroom A

A dose coefficient is a measure of radiation dose (e.g., absorbed or equivalent dose rate, committed equivalent dose, or committed effective dose) to a specified tissue or to the whole body per unit intake of a radionuclide for internal emitters and per unit concentration of a radionuclide in an environmental medium for external irradiation.

For decades, Oak Ridge National Laboratory (ORNL) has led the effort in the computation of internal and external dose coefficients in the support of federal regulations and international guidance. Dose coefficients have applications in a variety of fields, including occupational radiation protection, emergency response, and nuclear medicine. The Center for Radiation Protection Knowledge at ORNL has developed the Dose and Risk Coefficient PAcKage (DRCFPAK) software application (https://www.dcfpak.org/), which has archived the fundamental dose and risk coefficients over the past 36 years. The science behind the history and development of dose coefficients, as well as applications on how to employ dose coefficients will be discussed.

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**CEL-4 Radioecology 1 – Introduction to Radioecology and Environmental Protection Programs**  
*C.A. Condon*

**Location:** White Flint Amphitheatre

This course will be an introduction to the field of Radioecology and its prevalence in the field of Health Physics. It will begin with a basic introduction to radioecology including natural & anthropogenic sources of radiation as well as basic fate and transport of radionuclides through environmental systems. The course will continue by covering how radionuclides are recommended to be regulated (International Commission of
Radiological Protection & National Council on Radiation Protection) and how they are currently regulated in the environment in the United States (Nuclear Regulatory Commission & Department of Energy). Following this we will discuss how the US regulates and addresses sites with historical contamination of radionuclides that are classified under RCRA (Resource Conservation and Recovery Act) & CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act) and the controversies facing these decisions. Finally, this class will cover the current international state of radioecology (including current controversies on low dose effects to wildlife) and the future of radioecology. [This CEL is ideally to be followed by the other radioecology CEL on dosimetry and modelling which will build off information given in this course.]

**Wednesday 6:45 AM – 7:45 AM**

**CEL-5 Radiological Toolbox 3.0.0**

*S. Dewji and M. Hiller*

*Center for Radiation Protection Knowledge, Oak Ridge National Laboratory*

*Location: Grand Ballroom A*

The Radiological Toolbox software developed by Oak Ridge National Laboratory (ORNL) for the U. S. Nuclear Regulatory Commission is designed to provide electronic access to a vast and varied array of data needed in the field of radiation protection and shielding. Such data consolidates physical, chemical, anatomical, physiological, and mathematical parameters, which would otherwise require consulting multiple sources to retrieve this information. This software provides ready access to data of interest in radiation safety and protection of workers and members of the public. The data include dose coefficients for intakes of radionuclides, external exposure to radionuclides distributed in environments, and for exposures to photon and neutron radiation fields. Other supportive data include interaction constants and coefficients for alpha, beta (i.e., electron), gamma (i.e., photon or x-ray) and neutron radiations, nuclear transformation data, biological, radiological and physiological data, and supplemental information on various related topics. The functionality and example problems will be explored to enable participants to harness the full capabilities of this software. The Radiological Toolbox 3.0.0 can be obtained from the U. S. Nuclear Regulatory Commission Radiation Protection Computer Code Analysis and Maintenance Program at https://www.usnrc-ramp.com.

**CEL-6 Radioecology 2 – Dose to Biota**

*D.R. Neville*

*Location: White Flint Ampitheatre*

The components and estimation of doses to biota are covered in this course as well as the relevant endpoints of concern. Biota doses come from a variety of components in the environment, ranging from cosmic/solar, external gamma and internal sources. The contributions from naturally occurring and anthropogenic/ TENORM vary considerably for terrestrial versus freshwater and marine biota, which are each treated in the presentation. Differences in the relative sensitivities and relevant endpoints for each are discussed with regards to Derived Consideration Reference Levels (DCRLs). Methods of calculation of these doses include homogenous ellipsoids as well as more detailed voxel models. Finally, the complexities in the production of these models are covered, including geometry, density, elemental composition and relative compartmentation of radionuclides relative to those found in the surrounding environment.
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BETHESDA NORTH MARRIOTT HOTEL FLOOR PLANS

MAIN LEVEL

LOWER LEVEL

REGISTRATION DESK
OFFICES
GREAT FALLS
MIDDLETOWN
MIDWEST
LINDEN OAK
BROOKSIDE
A
B
SENeca BOARD ROOM
OAKLEY
WHITE FLINT AMPHITHEATER
FOREST GLEN
STRATHMORE

GLEN ECHO

WHITE OAK A
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- Beta Secondary Standard 2

For more information, please contact:

Ph: 404 352 8677
F: 404 352 2837
E: isotrakUSA@ezag.com
W: www.ezag.com