Monday:

CEL 1 **Modeling Data for Radiological Impact Assessment: Humans and Biota**

Stephanie Bush-Goddard and **Tanya Oxenberg**, United States Nuclear Regulatory Commission

Protection of the environment from radiation is nothing new. Both humans and biota are well studied and the regulatory framework is well established. However, there are gaps in biota data and an explicit assessment to integrating human and biota doses is not well documented.

This Continuing Education Lecture explores the International Atomic Energy Agency (IAEA) MODAIRA II (Modelling and Data for Radiological Impact Assessment) Working Group (WG) 3 program. MODAIRA's primary objective is to enhance the capabilities of Countries to simulate radionuclide release, mobilization, and transfer in the environment and, thereby, assess resulting public exposure. Working Group 3, entitled: "Assessments and Control of Exposures to Public and Biota for Planned Releases to the Environment", charter is to develop and apply an integrated approach to studying the impact of environmental releases on both humans and biota from ionizing radiation resulting from applications of radionuclides in power production, medicine, research, and industry.

Therefore this lecture will explore international and national guidance and regulations to demonstrate compliance with protecting the environment against ionizing radiation for humans and biota. It will also summarize state of the art methods and computer codes for performing dose assessments and identify a set of scenarios where explicit assessment of the environment would be necessary.

Tanya will be presenting

Tuesday

CEL 2 **Channeling Stephen Hawking: How Lessons from the Renowned Astrophysicist can inform and inspire Great Health Physics for the Future**

Mark D. Hoover,

From making theoretical predictions about radiation and black holes, to developing a theory of cosmology, to commenting on the future of humanity, Stephen Hawking (1942-2018) was a thoroughly discerning thinker and communicator. This lecture will revisit some of the many scientific and philosophical insights of this renowned champion of discovery that can inform and inspire our pursuit of great health physics in the future. Individuals planning to attend the lecture are invited to read the entertaining and informative writings of Prof. Hawking, including his 1988 classic *A Brief History of Time*, as well as his 2011 assessment of the impactful products of the scientific giants of history: *The Dreams That Stuff Is Made of: The Most Astounding Papers of Quantum Physics and How They Shook the Scientific World.*

Wednesday

CEL 3 **Essential Elements of an Effective Radiation Protection Program**

Jim Dillard, Department of Energy

Having a GOOD radiation protection program is often not good enough. Along with identifying measures developed and implemented to achieve continuing compliance with applicable regulations, as well as providing a framework for addressing radiation safety issues in the workplace, an effective program also provides a process for continuous and systematic improvements. Although there is a vast array of guidance with regards to radiation protection program development, ALARA planning, and conducting self-assessments, very little discusses strategies and mechanisms for ensuring continuous improvement is achieved. This discussion will highlight the essential elements of an effective radiation protection program that looks beyond specific regulatory requirements and discusses incorporation of operational experiences and lessons learned, implementing an integrated safety management approach to optimize worker protection from all hazards, and cultivating a culture of safety in a radiation protection environment.

Thursday

CEL 4 **Lessons Learned Identified during Independent Verification Activities**

D.A. King, Oak Ridge Associated Universities (ORAU)

Oak Ridge Associated Universities (ORAU) has served as an independent (third party) verification (IV) contractor for both the U.S. Department of Energy and the U.S. Nuclear Regulatory Commission. This paper summarizes lessons learned ORAU has gathered from decades of IV activities across a broad range of decontamination and decommissioning (D&D) projects. As presented herein, lessons learned are grouped into their applicable phase of the data lifecycle as outlined in the *Multi-Agency Radiation Site Survey and Investigation Manual (MARSSIM)* (DOE/NRC 2000), including: planning, implementation, and assessment. These lessons learned may be common to several sites, or may be identified at a single site but significant enough to cause a dramatic shift in D&D activities. In either case, the objectives of this paper are to contribute to the health physics body of knowledge and to help D&D projects avoid similar issues that tend to detrimentally impact budgets, project schedules, and customer/contractor reputation.