

2020 Annual Nuclear Security Summit at Georgetown: Use of Emerging Technologies for Disaster Management- Cases of Nuclear Disaster and the COVID-19 Pandemic

In Conjunction with the Bionuclear & Emerging Technologies Working Groups

Date: November 16-18, 2020

Place: Georgetown Medical Center / Virtual Zoom

Sponsors:

- Biomedical Science Policy and Advocacy, Georgetown University Medical Center (GUMC)
- Defense Threat Reduction Agency (DTRA)
- U.S. Department of State (DOS)

Rationale:

The [COVID-19 pandemic](#) abruptly brought our attention to the daunting challenges of disaster management on both national and global scales. Although some of those challenges were unique to the particular demands imposed by the emergence of a novel infectious disease, others can be more broadly applied to almost any disaster scenario. The convergence of policy and governance, societal needs and demands, economic impacts, biomedical infrastructure, scientific endeavor, and technological discovery dictates courses of action to mitigate the impacts of disaster and to plot a course for recovery. The 2020 Nuclear Security Summit will provide a venue for examining the elements of disaster management and identifying successes as well as areas for continuing development.

Key Session Themes:

Day one sessions are jointly hosted by the Bionuclear and Emerging Technologies Working Group and Emerging Technologies Working Group. Morning sessions will emphasize nuclear disasters and will include an overview of proposed solutions for environmental as well as human monitoring. Afternoon sessions will focus on emerging technologies that may be brought to bear for addressing the most pressing issues during and in the aftermath of nuclear and other disasters. The day will culminate in an open discussion forum.

Days two and three will include both presentations and breakout sessions during which participants are encouraged to identify gaps in knowledge and capability in addition to new technologies that could lead to more effective disaster management. Day two sessions will include those highlighting dissemination of information through various media and official channels, the impacts of policy and decision-making frameworks, available technologies for containment and control through recovery, modeling and forecasting, and unanticipated higher-order effects. Day three will hone in on the COVID-19 pandemic as a “case study” to gauge our ability to respond to disasters of international magnitude. The Summit will conclude with discussions on research and development efforts of importance for developing effective

prevention and recovery strategies. The overarching goal is lay the foundation for the development of practices and safeguards to enhance preparedness for and promote resiliency to future disasters.

Day 1: Monday, November 16 Nuclear Disasters & Emerging Technologies // Bionuclear (BNWG) and Emerging Technologies (ETWG) Working Group Meeting		
8:30 - 9:00a	Opening Remarks: Welcome to the 2020 Nuclear Security Summit at Georgetown	Richard Calderone, Director, MS Program Biomedical Science Policy and Advocacy & Chair of Microbiology and Immunology Georgetown University, School of Medicine
9:00 - 10:40a	BNWG: DTRA Basic Research Project Reviews (Chair: Heather Meeks, DTRA)	
9:00 - 9:20a	Melanized Fungi as Discriminators for Nuclear Fallout Radionuclides	Ekaterina Dadachova, University of Saskatchewan
9:20 - 9:40a	Epigenetic Mechanisms in the Recovery of the Bacterium <i>Deinococcus radiodurans</i>	Michael Daly, Uniformed Services University of the Health Sciences
9:40 - 10:00a	Characterizing Transcriptome Signatures Across Microbes That are Specific to Low Dose Radiation Stress Responses	Lydia Contreras, University of Texas, Austin
10:00 - 10:20a	Global Mass Spectrometry-Based Analysis of Covalent Modifications in Proteomes after Radiation	Michael Sussman, University of Wisconsin, Madison
10:20 - 10:40a	Development of Brassica as a Low Dose Radiation Biosensor	Patrick Concannon, University of Florida
10:40 - 11:00a	MORNING BREAK	
11:00 - 12:40p	BNWG, cont'd (Chair: Tomoko Steen, GUMC)	
11:00 - 11:20a	Xe Sensing via Insights from Noble-Gas Protein Interactions	Sanford Asher, University of Pittsburgh
11:20 - 11:40p	Discovery and Manipulation of Biomolecular-Noble Gas Interactions	Stephen Craig, Duke University

11:40 - 12:00p	Exploring the Effect of Noble Gases on Enzyme Activity and Bacterial Growth	Anne Ruffing, Sandia National Laboratory
12:00 - 12:20p	Development and Implementation of Neutron Activation Analysis for Rapid Determination of Xenon Content in Biological Samples	Glenn Fugate, Oak Ridge National Laboratory
12:20 - 12:40p	Mediated Electrochemical Probing: A New Approach to Reveal Global Redox Signatures of Exposure and State	Gregory Payne, University of Maryland
12:40 - 1:00p	BIONUCLEAR SOCIETY PRESENTATIONS: Q&A	
1:00 – 2:00p	LUNCH BREAK	
2:00 – 4:15	ETWG: Emerging Technologies for Disaster Management (Chair: Astrid Lewis, US Department of State)	
2:00 – 2:30	Open Source Nuclear Detection System (OSNDS)	James Stroup, Air Force Technical Applications Center
2:30 - 3:00p	Molecular Cryptography	Sterling Sawaya, Geneinfosec
3:00 - 3:30p	Integrative ‘Omics via Computational Approaches	Michael Nestor, J&J
3:30 – 4:00p	NSF Manufacturing Research Programs	Bruce Kramer & Andy Wells National Science Foundation
4:00 – 4:15p	EMERGING TECHNOLOGIES: Q&A	
4:15 - 4:30p	BREAK	
4:30 – 5:30p	CLOSED SESSION: NEXT STEPS FOR BIONUCLEAR AND EMERGING TECHNOLOGIES WORKING GROUPS (Public participants use this as break)	
5:30 - 6:30p	Lightening Talks by Young Investigators	
5:30 - 5:40p	Requirements for the Hazmat First Respondents for Disasters	Joshua Rabotnick, Georgetown University
5:40 - 5:50p	US Biolaboratories in Ukraine: Managing Outbreaks in Abroad	Abigail Staggemeier, Georgetown University
5:50 - 6:00p	Minorities and Covid19	Jennifer Argueta-Contreras, Georgetown University

6:00 - 6:10p	Covid19 Management: A Case of South Korea	Emerald O'Brien, George Washington University
6:10 - 6:20p	Transferable/Transmissible Vaccines to Prevent Human Pandemics	Noah Duff, Georgetown University
6:20 -6:30p	LIGHTENING TALK: Q&A	
6:30p	ADJOURN	

Day 2: Tuesday, November 17 General Disaster Management		
9:00 - 11:40a	Information Dissemination, Economic and Societal Impacts during Disaster Scenarios (Chair: Tomoko Steen, GUMC)	
9:00 - 9:20a	Official Channels	Takahiro Hamano, NHK (Japanese National TV)
9:20 - 9:40a	Role of Media	Maika Nakano, Nagasaki University
9:40 – 10:00a	Economic Impacts	Jessica McManus Warnell, Notre Dame University
10:00 - 10:20a	COFFEE BREAK	
10:20 - 11:10a	Keynote Address: Psychological, Sociological, and Medical Data	Virginia Murray, Health England
11:10 - 11:40a	PANEL DISCUSSION	
11:40 – 12:30p	LUNCH BREAK	
12:30 - 2:00p	Technologies (Chair: James Alleman, Notre Dame University)	
12:30 - 12:50p	Risk Reduction	Daniela Stricklin, Food & Drug Administration
12:50 - 1:10p	Epigenetics of Radiation Exposure	Janet Baulch, University of California
1:10 - 1:30p	The Chemistry of Water Purification	Jeffrey DePriest, DTRA
1:30 – 2:00p	PANEL DISCUSSION	

2:00 – 2:10p	BREAK	
2:10 - 4:00p	Modeling and Forecasting (Chair: Jean-Pierre Auffret, George Mason University)	
2:10 - 2:30p	Rapid Acquisition of Data	Jason Matheny, Georgetown University
2:30 - 2:50p	Consequence Modeling	John Weidner, University of Cincinnati
2:50 - 3:10p	Climate and Ocean Risk Vulnerability Index	Sally Yozell, Stimson Center
3:10 – 3:30p	TBD	Alex Engler, Georgetown University
3:30 - 4:00p	PANEL DISCUSSION	
4:00 - 4:10p	AFTERNOON BREAK	
4:10 – 6:20p	Second- and Third-Order Effects (Chair: Astrid Lewis, US Department of State)	
4:10 - 4:30p	AI Virtual and Augmented Reality Distance Learning Measuring Indirect Losses: educational	Steven King, University of North Carolina, Chapel Hill
4:30 - 4:50p	Socioeconomic Solutions	Nichol Turner-Lee Brookings Institute
4:50 - 5:10p	Psychological Impacts of Disasters	Evelyn Bromet, Ph.D, Director of Epidemiologic Research, Stony Brook University, Renaissance School of Medicine
5:10 – 5:30p	Energy Resource Governance Initiative	David Keavney, DOS
5:30 – 5:50p	Updates on Fukushima Recovery	Tao Yooichi, Fukushima Saisei no Kai (Resurrection of Fukushima)
5:50 – 6:20p	PANEL DISCUSSION	
6:20p	ADJOURN	

Day 3: Wednesday, November 18 COVID-19: A Case Study		
9:00 - 10:30a	Keynote Panel: Information Dissemination and Impacts of COVID-19 Policy and Decision-Making Frameworks during the Pandemic (Chair: Tomoko Steen, GUMC)	
9:00 - 9:20a	Role of Public Health Organizations, Government, and Media: One Health	Bernadette Dunham, George Washington University
9:20 - 9:40a	Ethical and Societal Implications of the Pandemic	Jonathan Moreno, University of Pennsylvania
9:40 - 10:00a	Medical Implications and Racial Inequality of the Pandemic	Ezekiel Emanuel, University of Pennsylvania
10:00 - 10:30a	PANEL DISCUSSION	
10:30 - 10:50a	MORNING BREAK	
10:50 - 2:20p	Biomedical Technologies (Chair: Kavita Berger, National Academy of Sciences)	
Session 1: Rapid Diagnostics for Field- and Clinical Settings		
10:50 - 11:10a	Veritas Technology	William Hug, Photon Systems
11:10 - 11:30a	Saliva Direct	Robby Sikka, Minnesota Timberwolves
Session 2: COVID-19 Vaccines & Treatments		
11:30 - 11:50a	Recombinant Vaccines for Universal Protection	Gregory Tobin, BMI, Inc.
11:50 - 12:10p	Vaccinees	Mark Mulligan, Ph.D., Department of Medicine and Microbiology, NYU
12:10 – 12:50p	LUNCH BREAK	
Session 3: Lessons Learned: How do we prepare?		
12:50 - 1:10p	Training Future Doctors to Prepare for Pandemics	David Harrison, Potomac Institute

1:10 - 1:30p	Health Literacy and Community Work	Janessa Mendoza & Sannidhi Shashikiran, Georgetown University
1:30 - 2:00P	PANEL DISCUSSION	
2:00 – 2:20p	BREAK	
2:20 – 4:10p	Modeling and Forecasting (Chair: Astrid Lewis, U.S. Department of State)	
2:20 – 2:40p	TBA	
2:40 - 3:00p	Modeling Host Responses to Infection	Josep Bassaganya-Riera, Biotherapeutics, Inc.
3:00 - 3:20p	COVID-SEE: Enabling Scientific Evidence Exploration through Semantics in a Time of Crisis	Karin Verspoor, University of Melbourne
3:20 – 4:10p	PANEL DISCUSSION	
4:10 - 4:20p	AFTERNOON BREAK	
4:20 - 6:10p	Second- and Third-Order Effects (Chair: Said Jahanmir, NIST)	
4:20 – 4:40p	Subcommittee on Advanced Manufacturing: Interagency Collaboration COVID Response	Patrick Looney, Executive Office of President/OSTP, Co-chair
4:40 – 5:00p	Subcommittee on Advanced Manufacturing: Interagency Collaboration COVID Response	Mike Molnar, DOC, Co-chair
5:00 - 5:20p	Disaster Managements Policy and Covid19 in Japan	Council Kume, Chief of Science Team, Embassy of Japan
5:20 - 5:40p	Implications for Economics after Disaster	Yuzuka Kashiwagi, Waseda University
5:40 - 6:10p	PANEL DISCUSSION	
6:10 – 6:15p	CONCLUDING REMARKS	
6:15p	ADJOURN	