All Times EDT	Wednesday May 19, 2021
9:15AM-9:30AM	**Welcome** **Scott Doebling, V&V Symposium Chair** **Tom Costabile, ASME CEO and Executive Director**
9:30 AM-10:00 AM	**Live* Keynote Speaker:** **Brent Craven, US FDA** **Topic : VVUQ and Regulatory Policies in Medical Devices**
10:00 AM - 10:30 AM	**Plenary Panel Discussion Live*** **Brent Craven US FDA, Windi Hary, HeartFlow, Inc. Marco Viceconti, Università di Bologna, Markus Reiterer, Medtronic,** **Flora Musuamba Tshinanu, Federal Agency for Medicines and Health Products** **Moderators: Jeff Bischoff, Zimmer Biomet and Marc Horner, ANSYS**
10:30 AM - 10:40 AM	*Break*

	Room 1	Room 2
Session 1 **10:40 AM-12:00 PM**	**10-01 VVUQ for Biomedical Engineering** **Live Panel*** **Moderators: Marc Horner, ANSYS, Jeff Bischoff, Zimmer Biomet and Payman Afshari, Depuy-Synthes** VVUQ 40 Verification, Validation, and Uncertainty Quantification in Computational Modeling of Medical Devices Jeff Bischoff, Zimmer Biomet Mark Goodin, Simutech Group Jeremy Rawlinson, Medtronic Spine /Kerim Genc, Simpleware Inc. Julien Clin, Spinologics Inc. /Mark Driscoll, McGill University Cheryl Liu, Stryker Paul Briant, Exponent Inc. Brandon Lurie, W.L. Gore & Associates Brent Craven, US FDA	**07-01 VVUQ for Fluid Dynamics and Heat Transfer** **Moderator: Brandon Wilson** VVS2021- 65256 Bayesian Inference Calibration of Building Energy Models for Arid Weather Author: Danlin Hou VVS2021-65325 Asymmetrical Heat Distribution Pattern in Miniature Heat Sinks Due to Conjugate Heat Transfer Author: Mahyar Pourghasemi VVS2021-65272 Estimation of Room-Level Cooling Energy in Hot/Arid Climate by Machine Learning-Based Approaches Author: Jia Bingyan VVS2021- 65326 Error Quantification of Nusselt Number Analysis in Miniature Heat Sinks: Verification and Validation Assessment Author: Mahyar Pourghasemi
12:00 PM - 12:10 PM	*Break*	
Session 2 **12:10PM-1:10PM**	**10-02 VVUQ for Biomedical Engineering II** **Live Panel (2)*** VVUQ 40 Verification, Validation, and Uncertainty Quantification in Computational Modeling of Medical Devices V&V 40 Code Verification Challenge Problem and V&V 40 Calculation Verification Challenge Problems Marc Horner, ANSYS Ismail Guler, Boston Scientific Corporation Nuno Rebelo, Nuno Rebelo Associates LLC	**06-02 Methods for Uncertainty Quantification, Sensitivity Analysis, and Prediction II** **Moderator: Gowri Srinivasan** VVS2021- 65291 Multivariate Metric Assessment of the Suitability of Different Rans Turbulence Models for the Simulation of Mini-Channels Cooling Systems for the Fusion Gyrotron Resonator Author: Rosa Difonzo VVS2021-65284 Development and Verification of an Integrated Seawater Desalination and Renewable Energy System Model Author: Muath Bani Salim VVS2021-65296 Uncertainty in Acoustical Measurements: An Unsettling Perspective Author: Robert Putnam & Richard Peppin
1:10PM-1:30PM	**Wednesday Networking Lunch** **Bring your lunch and come join the conversation.**	
	Topic 1: Biomedical Discussion **Moderator: Kathryn Hyam**	**Topic 2: Methods for UQ discussion** **Moderator: Dan Papert**
1:30PM-2:30PM	**Live Plenary Panel** **VVUQ for Small and Micro Nuclear Reactors - Next Generation of Nuclear Energy** **Speakers : Hans Gougar - X-Energy, Gerhard Strydom - INL, Brian Jackson - Kairos, Robert Martin - BWXT,** **Herman van Antrwerpen - X-Energy** **Moderator: Yassin Hassan - Texas A&M University**	
Session 3 **2:35PM-4:15PM**	**02-01 Development and Application of** **Verification and Validation Standards** **Moderator: Joshua Kaizer** VVS2021-67648 Proposal for V&V-2: A Common Set of Equations for Verification, Validation, and Uncertainty Quantification Author: Joshua Kaizer VVS2021-67764 Primary Stability in Reverse Shoulder Arthroplasty: Model Validation per ASME V&V 40-2018 Standard Author: Mehul Dharia VVS2021-68825 Reliability and Repeatability of Strains Measured by Digital Image Correlation for Nitinol Specimen Author: Koray Senol VVS2021-65094 A Framework for In Silico Clinical Trials for Medical Devices Using Concepts From Model Verification, Validation, and Uncertainty Quantification (VVUQ) Author: Jeffrey Bodner VVS2021-73011 Comparison of the V&V10.1 and V&V20 Validation Procedures for the V&V10.1 Example Author: Luis Eca	**01-01 Challenge Problem Workshops and Live Panel Session*** **Moderators: Yassin Hassan and Michelle Pagano** VVS20201- 67160 Simulation of the Second Asme V&V Benchmark Problem: Isothermal Single Jet Author : Sophie Brown VVS2021-67949 Non-Isothermal Single-Jet Cfd Numerical Model Validation Using Star-Ccm+ Author: Andrea Zappatore VVS2021-74957 Temperature Measurements of Plenum to Plenum Natural Circulation of a High Temperature Gas-Cooled Reactors Experiment Facility Author: Anas Alwafi
4:15PM - 4:30PM	**Networking Break** **Topic 1: Nuclear Applications** **Moderator: Michelle Pagano**	**Networking Break** **Topic 2: Standards Development** **Moderator: Kathryn Hyam**
Session 4 **4:30PM-5:30PM**	**06-01 Methods for Uncertainty Quantification, Sensitivity Analysis, and Prediction** **Moderator: Gowri Srinivasan** VVS2021-65073 Extracting Low-Dimensional Features From Field Data for Calibration Author: Kyle Neal VVS2021-65320 Correcting Predictions Using Model Form Error Estimation Author: Kyle Neal VVS2021-67396 Is Discrete-Direct Model Calibration and Uncertainty Propagation More Trustworthy for Estimating Tail Percentiles and Probabilities Than Bayesian Approaches? Author: Vicente Romero	**12-01 VVUQ for Advance Manufacturing and Computational Electromagnetics, Plasma, Radiation** **Moderator:Tao Xing** VVS2021-65231 Response Effects Due to Polygonal Representation of Pores in Porous Media Thermal Models Author: Kevin Irick VVS2021-66585 Manufactured Solutions for the Method-of-Moments Implementation of the Electric-Field Integral Equation Author: Brian Freno VVS2021-68039 Geometrically Symmetric Quadrature Rules for Singular Integrals in the Method-of-Moments Implementation of the Electric-Field Integral Equation Author: Brian Freno

Reception 5:30 - 6:15 PM- TBD (A link may be provided taking participants outside of Pheedloop)

Thursday May 20, 2021

Welcome
Scott Doebling, V&V Symposium Chair

9:15AM-10:20AM	**Live Plenary Panel: Topic : VVUQ for Machine Learning** **Moderator: Katie Lewis - Lawrence Livermore National Laboratory, Gowri Srinivasan - Los Alamos National Laboratory** **Panelists : Brian Spears - Lawrence Livermore National Laboratory, Garrison Flynn - Los Alamos National Laboratory** **Bahman Engheta - Medtronic**

10:20AM - 10:30AM	*Break*

	Room 1	**Room 2**
Session 5 10:30AM-11:15AM	**15-01 VVUQ for Artificial Intelligence and Machine Learning Models** **Moderator: Brian Freno**	**04-01 Verification Methods** **Moderator: Luis Eca**
	VVS2021-65045 Uncertainty Quantification of Deep Neural Network-Based Turbulence Models for Reactor Transient Analysis Author: Yang Liu	VVS2021-67982 Error Transport Equations: Recent Progress and Current Challenges Author: Chris Roy
	VVS2021-65294 Predictive Analytics and Uncertainty Quantification of a Microwave Ablation Simulation With a Spatially Varying Response Author: Gavin Jones	VVS2021-65290 Discretization Error Estimation in Subsonic, Transonic and Supersonic Flows of an Inviscid Fluid Over a Bump Author: Luis Eca

11:15AM-11:40AM	**Networking Break** **Topic 1: Artificial Intelligence** **Moderator: Dan Papert**	**Networking Break** **Topic 2: Verification and Validation Methods** **Moderator: Kathryn Hyam**
	03-01 Topics in Verification, Validation & Uncertainty Quantification **Moderator: Scott Doebling**	**07-02 VVUQ for Fluid Dynamics and Heat Transfer II** **Moderator: Kevin Dowding**
Session 6 11:40AM - 1:00PM	VVS2021-65268 Bayesian Calibrating Educational Building Thermal Models to Hourly Indoor Air Temperature: Methodology and Case Study Author: Ibrahim Hassan	VVS2021-67405 Verification & Validation Strategy for Scale-Resolving Simulations of Turbulence Author: Filipe Pereira
	VVS2021-67341 V&V Adjacent Activities, or How People Avoid Doing Quality V&V Author: William Rider	VVS2021-68037 Nonintrusive Manufactured Solutions for Ablation Author: Brian Freno
	VVS2021-67604 A Hierarchical Strategy for Verification, Validation, and Uncertainty Quantification of Modeling 3d Features in Inertial Confinement Fusion Using Xrage Author: Brandon Wilson	VVS2021-68040 Code-Verification Techniques for Hypersonic Reacting Flows in Thermochemical Nonequilibrium Author: Brian Freno
	VVS2021-67977 Communication of Simulation Results Author: William Oberkampf	

1:00PM - 1:30PM	**Thursday Student Poster Q&A** **Bring your lunch and come join the conversation** **Moderator: Scott Doebling & Michelle Pagano**
	VVS2021- 65224 Biomechanical Modeling of Proximal Junctional Failure: Credibility Assessment Following ASME V&V40 Standard Framework Author: Maeva Lopez Poncelas
	VVS2021-65249 Utilization of Finite Element Analysis for Comparing Rotary Cutter Tooth Designs for Biomass Comminution Rotary Crumbler® Shear Processing Head Author: Misael Ortiz
	VVS2021-68841 The Role of Calibration Complexity in Predictive Modeling Author: Xinyue Xu
	VVS2021-68846 Multi-Fidelity Model Calibration With Quantified Uncertainties Author: Sepideh Ebad Sichani
	VVS2021- 65909 Multi-Dimensional, State-Aware Calibration as Applied to Models of Vibration Isolation Author: Adway Das

1:30PM-1:40PM	*Break*

1:40PM-2:40PM	**Live Plenary Panel** **Topic : VVUQ in Higher Education: Preparing the Next Generation of Engineers** **Host : Tao Xing, University of Idaho** **Speakers: Luis Eca - University of Lisbon, Scott Doebling - Los Alamos National Laboratory**

2:40PM - 2:50PM	*Break*

	05-01 Validation Methods **Moderator : Aaron Koskelo**	**Live Panel *** **VVUQ 50 Committee Overview Session**
Session 7 2:50PM-4:10PM	VVS2021-66331 Not All Uncertainties Are Created Equal: Re-Visiting the Area Metric Author: Jeffrey Bodner	
	VVS2021-68044 Linking Material Models Between Codes: Example of a Cerium Taylor Cylinder Author: Joanne Budzien	VVUQ 50 Verification, Validation, and Uncertainty Quantification in Computational Modeling of Advanced Manufacturing VVUQ 50 Model Life Cycle
	VVS2021-63350 Is Model Validation Valid? Author: George Hazelrigg	Sudarsan Rachuri, Department of Energy William Schindel, ICTT System Sciences Fred Constantino, ASME
	VVS2021-66544 A Strategy for Utilizing Clinical Data to Achieve and Demonstrate Credibility of Models of Clinical Device Performance Author: Jeffrey Bischoff	