

## 2021 Research Symposium on Environmental and Applied Fluid Dynamics

Monday and Tuesday, May 24 and 25, 2021

Online, <https://go.umd.edu/JHU-GWU-UMD-Symposium>

hosted by the Burgers Program for Fluid Dynamics, University of Maryland  
College Park, Maryland 20742

Monday, May 24<sup>th</sup>, 2021

9:00 am – 9:05 am	<b>WELCOME – James H. Duncan (Director of the Burgers Program for Fluid Dynamics, Professor, Department of Mechanical Engineering, University of Maryland)</b>
9:05 am – 9:50 am	Keynote Lecture: Prof. Dennice F. Gayme, The Johns Hopkins University “A coherent structure-based model of turbulent flow over drag-altering roughness”

### TECHNICAL SESSION I - Session Chair: An Wang (University of Maryland)

9:50 am – 10:10 am	Jian Gao (JHU Advisor: J. Katz) Experimental investigation of the flow structure around roughness elements embedded in the inner part of a turbulent boundary layer
10:10 am – 10:30 am	Ibrahim Yildiran (GWU Advisor: E. Balaras) Volume conservation and pressure boundary conditions in immersed boundary methods
10:30 am – 10:50 am	Jonathan Lefebvre (UMD Advisor: A. Jones) Wake-body interactions and the effect on airfoil performance
10:50 am – 11:05 am	<i>Morning Break</i>

### TECHNICAL SESSION II - Session Chair: Andrew Trettel (University of Maryland)

11:05 am – 11:25 am	Genevieve Starke (JHU Advisors: C. Meneveau & D. Gayme) The area localized coupled model for analytical mean flow prediction in arbitrary wind farm geometries
11:25 am – 11:45 am	Charles Fort (GWU Advisor: P. Bardet) Development of time-resolved MTV for aqueous solutions
11:45 am – 12:05 pm	Sophia Relph (UMD Advisor: K. T. Kiger) Free surface responses to a forced plunging jet
12:05 pm	<i>Adjourn until 9:00 am May 25<sup>th</sup></i>

Tuesday, May 25<sup>th</sup>, 2021

### TECHNICAL SESSION III - Session Chair: Katherine E. Lukens (University of Maryland)

9:00 am – 9:05 am	<b>WELCOME – James H. Duncan (Director of the Burgers Program for Fluid Dynamics, Professor, Department of Mechanical Engineering, University of Maryland)</b>
9:05 am – 9:25 am	Shantanu Bailoor (JHU Advisor: R. Mittal) Detecting aortic valve anomaly from induced murmurs: Insights from computational hemodynamic models
9:25 am – 9:45 am	Alexa Baumer (GWU Advisor: M. Leftwich) Biomechanical investigations into the cervical cerclage
9:45 am – 10:05 am	Aditya N. Sangli (UMD Advisor: D. Bigio) Dynamics of extensional drop deformation and capillary-driven breakup at low Reynolds number
10:05 am – 10:25 pm	Miguel Jimenez-Urias (JHU Advisor: T. Haine) Stirring and mixing of passive scalars by parallel shear flows: Floquet solutions and anomalous modes
10:25 am – 10:40 pm	<i>Morning Break</i>

### TECHNICAL SESSION IV- Session Chair: Xiaoxu Tian (University of Maryland)

10:40 am – 11:00 am	Geoffroy Chaussonnet (GWU Advisor: P. Bardet) Modeling multiple scattering transient of an ultrashort laser pulse by spherical particles
11:00 am – 11:20 am	Tomas Chor (UMD Advisor: J. Wenegrat) Insights into the mixing efficiency of centrifugal-symmetric instabilities in the ocean
11:20 am – 11:40 am	Ben Minnick (JHU Adviser: D. Gayme): Restricted nonlinear modeling for high Reynolds number wall-bounded turbulence
11:40 am – 12:00 pm	Roozbeh Hassanzadeh Azami (GWU Advisor: K. Sarkar) Effects of shell chemistry on the acoustic response and dissolution of lipid-coated ultrasound contrast microbubbles
12:00 pm – 12:20 pm	Pranava Jayanti (UMD Advisor: K. Trivisa) Mathematical analysis of micro- and macroscopic models of superfluidity
12:20 pm	<i>Adjourn to 2022 at George Washington University</i>