

Technical Session	Technical Session Organizer
1.2 Computational Physics and Techniques	Juan Trelles ( <a href="mailto:juan_trelles@uml.edu">juan_trelles@uml.edu</a> )

**Session MO 2.1: Computational Physics and Techniques I**

Monday, May 22, 2017 from 16:00-18:00, Wildwood 9

Session Chair: Matthew T Bettencourt, Sandia National Labs

**16:00 MO 2.1-1 PARAMETRIC STUDY OF THE CHARACTERISTICS OF TRICHEL PULSES FROM NEGATIVE NEEDLE TO PLANE CORONAS**

Y. Zheng, L. Wang, D. Wang, S. Jia  
*Xi'an Jiaotong University, Xi'an, China*

**16:15 MO 2.1-2 INFLUENCE OF EXTERNAL ELECTRIC FIELD BOUNDARY CONDITIONS ON ELECTROSPRAY EMISSIONS**

N. A. Mehta, D. A. Levin  
*Aerospace Engineering, The University of Illinois at Urbana - Champaign, Urbana, Illinois, United States*

**16:30 MO 2.1-3 (invited) PARTICLE-IN-CELL ALGORITHM ON UNSTRUCTURED TETRAHEDRAL MESHES**

S. N. Averkin, N. A. Gatsonis  
*Worcester Polytechnic Institute, Worcester, MA, United States*

**17:00 MO 2.1-4 TWO-DIMENSIONAL ELECTROMAGNETIC PLASMA SIMULATIONS WITH DIFFERENT COLLISION MODELS USING IPIC**

W. S. Koh<sup>1</sup>, S. -H. Chen<sup>2</sup>  
<sup>1</sup>*A\*STAR Institute of High Performance Computing, Singapore, Singapore, Singapore*  
<sup>2</sup>*Department of Physics, National Central University, Jung-Li, Taiwan*

**17:15 MO 2.1-5 NUMERICAL MODELING OF HIGH SPEED TIME VARYING PLASMA ANTENNA USING ELECTROMAGNETIC 2D PARTICLE-IN-CELL SIMULATION**

H. Y. Kim<sup>1</sup>, R. Kingsley-Shadi<sup>1</sup>, M. Golkowski<sup>1</sup>, M. B. Cohen<sup>2</sup>, M. L. R. Walker<sup>3</sup>  
<sup>1</sup>*Department of Electrical Engineering, University of Colorado Denver, DENVER, CO, USA*  
<sup>2</sup>*School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, GA, USA*  
<sup>3</sup>*School of Aerospace Engineering, Georgia Institute of Technology, Atlanta, GA, USA*

**17:30 MO 2.1-6 3-D PARTICLE IN CELL NUMERICAL SIMULATION OF UNDER-VOLTAGED PRESSURIZED SPARK GAP**

A. Elshafiey, S. Portillo  
*UNM, Albuquerque, NM, United States*

**17:45 MO 2.1-7 ADVANCED PIC-MCC SIMULATION FOR AN INTERMEDIATE-PRESSURE CAPACITIVELY COUPLED PLASMA FOR DEPOSITION PROCESS**

J. S. Kim<sup>1</sup>, H. J. Kim<sup>2</sup>, H. J. Lee<sup>1</sup>  
<sup>1</sup>*Electric computer engineering, Pusan National University, Busan, South Korea*  
<sup>2</sup>*Memory Thin Film Technology Team, Samsung electronics, Suwon, South Korea*

## Session TU 1.2: Computational Physics and Techniques II

Tuesday, May 23, 2017 from 10:00-12:00, Wildwood 10

Session Chairs: Nikolaos A. Gatsonis, WPI  
Juan Trelles, U Mass Lowell

### **10:00 TU 1.2-1 3D SIMULATION ON VACUUM ARC CONTROLLED BY THREE KINDS OF AMF CONTACTS**

J. Deng, L. Wang, X. Zhang, S. Jia  
*Xi'an Jiaotong University, Xi'an, Shaanxi, China*

### **10:15 TU 1.2-2 VARIATIONAL MULTISCALE FINITE ELEMENT SIMULATION OF A NONEQUILIBRIUM ATMOSPHERIC-PRESSURE ARC IN CROSSFLOW**

V. G. Bhigamudre, J. P. Trelles  
*Mechanical Engineering, University of Massachusetts Lowell, Lowell, MA, United States*

### **10:30 TU 1.2-3 MODELING OF ION THRUSTER PLUME AND BACKFLOW USING PIC-DSMC APPROACH WITH MULTIPLE GPUS.**

R. Jambunathan, D. A. Levin  
*Aerospace Engineering, University of Illinois, Urbana-Champaign, IL, United States*

### **10:45 TU 1.2-4 (invited) PERFORMANCE PORTABLE MULTI-SPECIES PLASMA CODE**

M. T. Bettencourt, J. C. Bennett, R. M. Kramer, A. H. Markosyan, C. H. Moore, R. P. Pawlowski, E. G. Phillips, A. Robinson, J. Shadid  
*1352, Sandia National Labs, Albuquerque, United States*

### **11:15 TU 1.2-5 VALIDATION AND VERIFICATION OF A KINETIC HEAVY PARTICLE TRANSPORT MODEL**

J. Trieschmann<sup>1</sup>, F. Schmidt<sup>1</sup>, D. Krueger<sup>1</sup>, R. P. Brinkmann<sup>1</sup>, T. Mussenbrock<sup>2</sup>  
<sup>1</sup>*Ruhr University Bochum, Bochum, Germany*  
<sup>2</sup>*Brandenburg University of Technology, Cottbus, Germany*

### **11:30 TU 1.2-6 MULTIPHYSICS MODELING AND SIMULATION OF ELECTRICAL BREAKDOWN IN LIQUID MEDIUM**

A. Charchi Aghdam, T. Farouk  
*Department of Mechanical Engineering, University of South Carolina, Columbia, SC, United States*

### **11:45 TU 1.2-7 ADVANCED MAGNETO-GAS-KINETIC SCHEME FOR MHD: ANALYSIS AND COMPARISON TO EXISTING MODELS**

S. Anderson, K. Hara, S. Girimaji  
*Aerospace Engineering, Texas A&M University, College Station, TX, United States*

## Session WE 2.1: Computational Physics and Techniques III

Wednesday, May 24, 2017 from 16:00-18:00, Wildwood 9

Session Chairs: Tanvir Farouk, University of South Carolina  
Juan Trelles, U Mass Lowell

### 16:00 WE 2.1-1 COMPUTATION OF CATHODE LAYER THICKNESS FOR NORMAL GLOW DISCHARGE

X. Wang<sup>1</sup>, X. Hou<sup>1</sup>, Y. Fu<sup>2</sup>, X. Zou<sup>1</sup>

<sup>1</sup>Tsinghua University, Beijing, China

<sup>2</sup>Michigan State University, East Lansing, USA

### 16:15 WE 2.1-2 (invited) STRUCTURE-PRESERVING SECOND-ORDER INTEGRATION OF RELATIVISTIC PARTICLE TRAJECTORIES IN ELECTROMAGNETIC FIELDS

A. V. Higuera<sup>1,2</sup>, J. R. Cary<sup>1,2</sup>

<sup>1</sup>University of Colorado, Boulder, Boulder, CO, United States

<sup>2</sup>Tech-X Corporation, Boulder, CO, United States

### 16:45 WE 2.1-3 THE DYNAMICS OF COLLISIONAL BUNEMAN INSTABILITY DEVELOPMENT

E. V. Rostomyan

*Theoretical, Institute of Radiophysics & Electronics National Ac Sci of Armenia, Ashtarack, Armenia*

### 17:00 WE 2.1-4 NEW MULTI-WEIGHT COLLISION ALGORITHM FOR DSMC/PIC SIMULATIONS OF GASES AND PLASMA FLOWS

S. N. Averkin, D. Han, N. A. Gatsonis

*Worcester Polytechnic Institute, Worcester, MA, United States*

### 17:15 WE 2.1-5 STUDY ON THE ANALYTICAL SOLUTION OF ELECTRON NUMBER DENSITY AND IMPEDANCE OF $\alpha$ MODE HELIUM RADIO-FREQUENCY ATMOSPHERIC PRESSURE GLOW DISCHARGES

H. Wang, J. Jiao, H. Luo, X. Wang

*Department of electric engineering, Tsinghua university, Beijing, China*

### 17:30 WE 2.1-6 COMPUTER SIMULATIONS FOR MODELLING EXPLOSIVE PROPERTIES OF BALL LIGHTNING

M. O. McDougall, S. Kelty, J. Lopez

*Physics, Seton Hall University, South Orange, NJ, United States*

### 17:45 WE 2.1-7 ELECTRON INTERACTIONS WITH PLASMA FEED GASES

C. G. Limbachiya<sup>1</sup>, R. Bhavsar<sup>2</sup>, M. Swadia<sup>3</sup>, M. Vinodkumar<sup>4</sup>

<sup>1</sup>Applied Physics, Department of Applied Physics, The M.S. University of Baroda, Vadodara (India) - 390001, Vadodara, India

<sup>2</sup>Physics, M.N. Science College, Visnagar, india

<sup>3</sup>Physics, HVHP Institute of PG Studies and Research, Kadi, India

<sup>4</sup>Electronics, V.P. Science College, Vallabh Vidyanagar, India