

The Department of Mechanical Engineering at
The University of Texas at El Paso
Proudly Presents

Southwest Emerging Technology Symposium 2016

Saturday, April 9th, 2016

The University of Texas at El Paso
500 W. University Ave.
El Paso, Texas 79968



Southwest Emerging Technology Symposium 2016

April 9th, 2016
Wyndham Airport Hotel
2027 Airway Blvd
El Paso, TX 79925

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FOREWARD

Welcome to the Southwest Emerging Technologies Symposium sponsored by Shell. The purpose of the symposium is to encourage communication among the engineers and scientists in and around the El Paso area's universities and industries.

The following individuals and organizations are acknowledged for their assistance with the symposium.

- Conference Chair: Dr. Ahsan Choudhuri, The University of Texas El Paso
- Technical Chair: Dr. Yirong Lin, The University of Texas El Paso
Dr. Pavana Prabhakar, The University of Texas El Paso
Dr. Norman Love, The University of Texas El Paso
- Logistics Committee: Gloria Salas, The University of Texas El Paso
Linda Luna, The University of Texas El Paso
- Hosted by: College of Engineering
Department of Mechanical Engineering &
MIRO Center for Space Exploration and Technology Research (cSETR)
The University of Texas at El Paso
- Welcome and Introduction: Dr. Ahsan Choudhuri
- Session Chairs: Dr. Samia Afrin, The University of Texas at El Paso
Mr. David Espalin, The University of Texas at El Paso
Dr. Louis Everett, The University of Texas at El Paso
Mr. Michael Everett, The University of Texas at El Paso
Dr. Angel Flores, The University of Texas at El Paso
Dr. Cesar Garcia, Lockheed Martin Aeronautics
Mr. Charles Scott Hill, The University of Texas at El Paso
Dr. Deidra Hodges, The University of Texas at El Paso
Dr. Arifur Khan, The University of Texas at El Paso
Dr. Chunqiang Li, The University of Texas at El Paso
Dr. Chris Navarro, Blue Origin
Dr. David Nemir, TXL Group, Inc.
Mr. Luis Ochoa, The University of Texas at El Paso
Mr. Abraham Trujillo, The University of Texas at El Paso
Dr. Jorge Villalobos, Shell WindEnergy Services Inc
Dr. Jianguo Wu, The University of Texas at El Paso
- Keynote Speakers: **John Applewhite**
Chief of Propulsion System,
NASA-Johnson Space Center
- Charles Chase**
Sr. Program Manager
Lockheed Martin Skunk Works
- Nick Gonzales**
Director, Systems Engineering
Space Systems Company
Lockheed Martin

Southwest Emerging Technology Symposium

THE UNIVERSITY OF TEXAS AT EL PASO

APRIL 8th – 9th, 2016

April 8th

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|---------|-----------------------------------|------------------------------------|----------------------------|
| 4:00 pm | RECEPTION/PRE-REGISTRATION | The University of Texas at El Paso | Engineering/CCSB Courtyard |
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April 9th

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| 6:30 am | REGISTRATION | Wyndham El Paso Airport | Room: Main Lobby |
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| 7:30 am | BREAKFAST | Wyndham El Paso Airport | Room: Rosewood |
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| 8:00 am | OPENING NOTES | Dr. Yirong Lin Assistant Professor Department of Mechanical Engineering The University of Texas at El Paso | Room: Rosewood |
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| 8:05 am | INTRODUCTION | Dr. Ahsan Choudhuri Professor and Chair Department of Mechanical Engineering The University of Texas at El Paso | Room: Rosewood |
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| 8:10 am | WELCOME | Dr. Howard C. Daudistel Interim Provost The University of Texas at El Paso | Room: Rosewood |
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| 8:30 am | KEYNOTE SPEAKER – I INTRODUCTION | Dr. Norman Love | Room: Rosewood |
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| 8:30 am | KEYNOTE PRESENTATION – I | | Room: Rosewood |
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**TITLE: Integrated LO2/CH4 Technologies and Systems Solutions
Relevant to Human Mars Exploration**

John Applewhite
Chief of Propulsion System,
Propulsion & Power Division, NASA JSC

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| 9:50 am | PARALLEL TECHNICAL SESSIONS I | |
| | Session 1-A Additive Manufacturing I | Room: Walnut |
| | Session 1-B Emerging Technologies I | Room: Satinwood |
| | Session 1-C Space Systems | Room: Sandalwood |
| | Session 1-D Energy and Sustainability I | Room: Orchid |
| | Session 1-E Aerospace and Energy Materials I | Room: Poplar |
| 10:00 am | SPECIAL SESSION: HIGH SCHOOL INFO SESSION | Room: A/V Theater |
| | Moderator: Dr. Ryan Wicker | |
| 10:50 am | BREAK AND POSTER SESSION | Room: Main Lobby |
| 11:10 am | PARALLEL TECHNICAL SESSIONS II | |
| | Session 2-A Additive Manufacturing II | Room: Walnut |
| | Session 2-B Emerging Technologies II | Room: Satinwood |
| | Session 2-C Propulsion and Energy Technologies I | Room: Sandalwood |
| | Session 2-D Energy and Sustainability II | Room: Orchid |
| | Session 2-E Aerospace and Energy Materials II | Room: Poplar |
| 12:10 pm | LUNCH | Room: Rosewood |
| 12:20 pm | KEYNOTE SPEAKER – II INTRODUCTION | Room: Rosewood |
| | Dr. Ryan Wicker | |
| 12:20 pm | KEYNOTE PRESENTATION – II | Room: Rosewood |
| | TITLE: Interactions | |
| | Charles Chase | |
| | Sr. Program Manager, | |
| | Revolutionary Technology Programs at Lockheed Martin Skunk Works | |
| 1:50 pm | PARALLEL TECHNICAL SESSIONS III | |
| | Session 3-A Additive Manufacturing III | Room: Walnut |
| | Session 3-B Emerging Technologies III | Room: Satinwood |
| | Session 3-C ITAR 1: Propulsion and Energy Technologies II | Room: Sandalwood |
| | Session 3-D Energy and Sustainability III | Room: Orchid |
| | Session 3-E Aerospace and Energy Materials III | Room: Poplar |
| 3:30 pm | BREAK AND POSTER SESSION | Room: Main Lobby |

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| 3:50 pm | PARALLEL TECHNICAL SESSIONS IV | |
| | Session 4-A Propulsion and Energy Technologies III | Room: Walnut |
| | Session 4-B Emerging Technologies IV | Room: Satinwood |
| | Session 4-C ITAR 2: Propulsion and Energy Technologies IV | Room: Sandalwood |
| | Session 4-D Energy and Sustainability IV | Room: Orchid |
| | Session 4-E Aerospace and Energy Materials IV | Room: Poplar |
| 5:30 pm | DINNER | Room: Rosewood |
| 5:40 pm | KEYNOTE SPEAKER - III INTRODUCTION | Room: Rosewood |
| | Dr. Pavana Prabhakar | |
| 5:40 pm | KEYNOTE PRESENTATION – III | Room: Rosewood |
| | TITLE: Lockheed Martin Space Systems Company | |
| | Nick Gonzales | |
| | Director, Systems Engineering | |
| | Space Systems Company | |
| | Lockheed Martin | |
| 7:00 pm | ADJOURN | |

ABOUT THE SPEAKERS

John Applewhite

John Applewhite is currently the Chief of the Propulsion Systems Branch in the Propulsion & Power Division (PPD) at the NASA Johnson Space Center (JSC) in Houston. A graduate of Texas A&M University with a BS in Mechanical Engineering, he began his career at NASA in 1989 and now leads a group responsibility for the development and oversight of spacecraft propulsion systems for human spaceflight including systems on the Orion, Commercial Crew, and International Space Station programs.



The Propulsion Systems Branch at JSC is also actively involved in technology development and demonstration efforts relevant to human exploration missions with a focus on integrated liquid oxygen (LO₂)/methane (CH₄) propulsion and integrated spacecraft systems. In his 27 year career at NASA, John has worked primarily in the field of propulsion having previously served as a Subsystem Manager for the Space Shuttle Orbiter Reaction Control System, a System Manager for the ISS propulsion elements and visiting vehicles, a NASA Systems Engineer for the Orbiter Main Propulsion System, and as the Division Chief Engineer with responsibility over all PPD Space Shuttle Orbiter systems including the main propulsion orbital maneuvering and reaction control, and auxiliary power systems. Outside of propulsion, John also served as a Project Lead Engineer for the Orion Crew Module vehicle and as a branch chief in the Vehicle Systems Engineering & Integration Branch.

ABOUT THE SPEAKERS

Charles Chase

Charles Chase manages the Revolutionary Technology Programs organization for the Lockheed Martin Skunk Works. The organization's charter is to create, mature, and transition a broad range of disruptive technologies with significant Lockheed Martin system impact.



Technology focus areas include: power and propulsion systems; RF and optical meta-materials; cognitive and physiological human performance monitoring; new sensor modalities; adaptive and bio-inspired structures; and plasma flow control devices.

He recently won the Lockheed Martin Innovate the Future contest with “Power from Low Speed Wind”, and was a semifinalist in the Buckminster Fuller Challenge with “Bio-Inspired Morphing” to eliminate design stagnation. He presented his organization's work on compact fusion power and propulsion at the 2013 Google “Solve for <X>” event. He was a low observable engineer on the F-117A production program and has also worked for the Lockheed Martin Space Systems Company as an electromagnetics group lead. He is a co-founder of CBH Technologies, a start-up developing next generation lighting technology and holds numerous patents.

ABOUT THE SPEAKERS

Nick Gonzales

Nick Gonzales serves as Director of Systems Engineering at Lockheed Martin (LM) Space Systems Company (SSC). He is responsible for approximately 1500 engineers and accountable for systems engineering and technology strategy spanning all products, from sensor systems and missile defense to human spaceflight and deep-space missions.



Previously, Mr. Gonzales performed the duties of Director and Chief Engineer for Lockheed Martin Space Systems Advanced Interceptor Programs. In this role, he was responsible for guiding the design of Lockheed Martin's offering for the next generation interceptor kill vehicle. The purpose of this kill vehicle was to enhance homeland defense against missile attack. When the Government decided they would assemble the best industry had to offer into a cohesive design, Mr. Gonzales served as the LM representative to that industry team.

Prior to embarking on that journey, Mr. Gonzales dedicated a large portion of his career to developing and fielding the THAAD interceptor. He started this effort in the systems test group where he set up the launch control room for implementation of countdown go/no-go operations and managed the \$90M development of the production test equipment used to ATP the missile rounds. He served as the manager of systems integration when the focus was on getting the interceptor qualified for flight. Mr. Gonzales transitioned to CSE during the flight test program, focusing on flight test mission success and on resolving issues discovered during flight operations. Finally, he served as the Director and CE of the THAAD interceptor, driving hard to obtain the approval of the United States Government to release the interceptor to the war fighters in order to defend our troops, friends, and allies in their theater of operation. The THAAD Missile Program employed approximately 200-700 people, dependent on the particular point in the life cycle, and continues to generate 400 million in sales to both US and Foreign Militaries for Lockheed Martin each year.

Under his leadership, the THAAD missile team has provided the Missile Defense Agency (MDA) and the Nation with a missile system that has demonstrated groundbreaking capability and reliably achieving a perfect mission success record. Mr. Gonzales has actively participated in and led the development efforts associated with Missile Systems, Missile Software, Missile Structure/Propulsion Elements and all Test Equipment.

Mr. Gonzales has over 28 years of successful hands on engineering experience and has held leadership positions in Engineering and Program Management. He received his bachelors of science in mechanical engineering from San Jose State University with a minor in electronics. He is a recipient of the prestigious Lockheed Martin NOVA award and has received various other recognition awards from the corporation.

PARALLEL TECHNICAL SESSION I

| | | |
|---|-------|---|
| Session 1-A: Additive Manufacturing I Session Chair: David Espalin, UTEP | | Room: Walnut Wyndham El Paso Airport |
| 9:50 am | 1A-1 | Design And Development Of The Material Handling Components For The Multi3D System S. Ambriz, D. Espalin, J. Coronel, M. Perez, R. Wicker, <i>UTEP</i> |
| 10:10 am | 1A-2 | Additive Manufacturing For Bonded Composite Joints R. Garcia, E. Acuna, P. Prabhakar, <i>UTEP</i> |
| 10:30 am | 1A-3 | Fabrication And Modeling of Smart Parts Using Electron Beam Melting Additive Manufacturing Technology R. Martinez, M. S. Hossain, J. A. Gonzalez, M. A. I. Shuvo, J. Mireles, A. Choudhuri, R. B. Wicker, Y. Lin, <i>UTEP</i> |
| Session 1-B: Emerging Technologies I Session Chair: Cesar Garcia, LMC | | Room: Satinwood Wyndham El Paso Airport |
| 9:50 am | 1B- 1 | Spatially Variant Periodic Structures In Electromagnetics (Presentation Only) Raymond Rumpf, <i>UTEP</i> |
| 10:10 am | 1B-2 | Numerical Simulation Of Ultrasonic Wave Propagation In Fiber-Enhanced Dielectric Nanocomposites For Quality Inspection J. Wu, Y. Lin, B. Tseng, <i>UTEP</i> |
| 10:30 am | 1B-3 | Location Of A Maximum Deflection Point With Fiber Bragg Gratings (Fbg) In Polarization Maintaining (Pm) Optical Fiber J. Quintana, <i>UTEP</i> |
| Session 1-C: Space Systems Session Chair: Louis Everett, UTEP | | Room: Sandalwood Wyndham El Paso Airport |
| 9:50 am | 1C-1 | Daedalus: Lox/Lch4 Suborbital Testbed Design J.Adams, J. Trillo, A. Johnson, A. Choudhuri, <i>UTEP</i> |
| 10:10 am | 1C-2 | Trajectory Simulation of a Terrier Improved Orion Launch Vehicle D. Camacho, J. Holt, M. Everett, Dr.Angel Flores Abad, <i>UTEP</i> |
| 10:30 am | 1C-3 | Dynamic Modelling of a Free-Floating Space Manipulator J. Yepez, J. De la Torre, A. Flores-Abad, <i>UTEP</i> |
| Session 1-D: Energy and Sustainability I Session Chair: Jorge Villalobos, Shell | | Room: Orchid Wyndham El Paso Airport |
| 9:50 am | 1D-1 | Bidding In Wholesale Energy Market M. M. P. Chowdhury, J. Juarez, C. Kiekintveld, <i>UTEP</i> |
| 10:10 am | 1D-2 | Use Of Life Cycle Sustainability Assessment For Energy Applications B.A. Benedict, <i>UTEP</i> |
| 10:30 am | 1D-3 | Transactive Energy Systems E. Galvan, P. Mandal, <i>UTEP</i> |

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| Session 1-E: Aerospace and Energy Materials I Session Chair: David Nemir, TXL Group | | Room: Poplar Wyndham El Paso Airport |
| 9:50 am | 1E-1 | Room Temperature Processed Cuscn Hole Transportation Layers For The Use In Perovskite Based Solar Cells J. Galindo, M. Martinez, S. Shahriar, V. Castenada, D. Kava, C. Sana, D. Hodges, <i>UTEP</i> |
| 10:10 am | 1E-2 | Synthesis Of $Cu_2ZNSNS_xSE_{x-4}$ Thin Films Absorber Layers For Low-Cost, High Efficiency Thin Film Solar Cells C. Sana, S. Shahriar, J. Galindo, D. Kava, V. Castaneda, M. Martinez, E. Castro, L. Echegoyen, D. Hodges, <i>UTEP</i> |
| 10:30 am | 1E-3 | Crysatllization Of Poly(3-Hexylthiophene) On Carbon Derivatives For Organophotovoltaic Application A. Mishra, V.S.A.Challa, K.C.Nune1, R.D.K Misra, D.Hodges, <i>UTEP</i> |

SPECIAL SESSION

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| Special Session High School Info Session Moderator: Ryan Wicker, UTEP | Room: AV Theater Wyndham El Paso Airport |
| 10:00 am | Dr. Ryan Wicker Professor Mr and Mrs. McIntosh Muchison I Endowed Charied Professor Director, W.M. Keck Ceter for 3D Innovation <i>UTEP</i> |
| 10:15 am | John Applewhite Chief, Propulsion Systems Branch <i>NASA-Johnson Space Center</i> |
| 10:30 am | Nick Gonzales Director, Systems Engineering <i>Space Systems Company</i> <i>Lockheed Martin</i> |
| 10:45 am | Michael Everett Staff Engineer <i>UTEP</i> |
| 11:30 am | Bowie High School and Hornedo Middle School Stellar Students in Orbit (SSiO) |

PARALLEL TECHNICAL SESSION II

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| Session 2-A: Additive Manufacturing II | | Room: Walnut |
| Session Chair: Luis Ochoa, UTEP | | Wyndham El Paso Airport |
| 11:10 am | 2A-1 | Developing A Controller For A Copper Wire Embedding Tool J. F. Motta, D. Espalin, R. Wicker, <i>UTEP</i> |
| 11:30 am | 2A-2 | A Novel Approach to Estimate Corrosion Effect in 3D Printed Bio Material's Using Taguchi Method S. D. Kilari, N. Kim, B. Tseng, <i>UTEP</i> |
| 11:50 am | 2A-3 | Economic Analysis Between Powder Bed-Based Additive Manufacturing Technologies J. A. Gonzalez, J. Mireles, Y. Lin, R. B. Wicker, <i>UTEP</i> |
| Session 2-B: Emerging Technologies II | | Room: Satinwood |
| Session Chair: Abraham Trujillo, UTEP | | Wyndham El Paso Airport |
| 11:10 am | 2B-1 | Damage Tolerance And Assessment Of Unidirectional Carbon Fiber Composites M. Flores, D. Mollenhauer, <i>UTEP</i> |
| 11:30 am | 2B-2 | Design And Testing Of Hybrid Composite Materials For Cryogenic Fuel Tanks R. Avila , Md. Islam , P. Prabhakar, <i>UTEP</i> |
| 11:50 am | 2B-3 | Stress Corrosion Cracking Susceptibility Of Aluminum Foils For Aerospace Applications E. Garcia, C. M. Stewart, <i>UTEP</i> |
| Session 2-C: Propulsion and Energy Technologies I | | Room: Sandalwood |
| Session Chair: Chris Navarro, Blue Origin | | Wyndham El Paso Airport |
| 11:10 am | 2C-1 | Design Of An Optically Accessible High Intensity Turbulence Combustion System A.Acosta-Zamora, A. de la Torre, A. Choudhuri, <i>UTEP</i> |
| 11:30 am | 2C-2 | Combustion Synthesis Of Zirconium Diboride And Hafnium Diboride: Thermodynamic Analysis S. Cordova, E. Shafirovich, <i>UTEP</i> |
| 11:50 am | 2C-3 | Flame Front Imaging Techniques On A Backward Facing Step Stabilized Flame A. de la Torre, A. Acosta-Zamora, A. Choudhuri, <i>UTEP</i> |
| Session 2-D: Energy Sustainability II | | Room: Orchid |
| Session Chair: Jorge Villalobos, Shell | | Wyndham El Paso Airport |
| 11:10 am | 2D-1 | Impact of intermittent Renewable energy sources on Power system analysis L. A. Gutierrez, P. Mandal , <i>UTEP</i> |
| 11:30 am | 2D-2 | Converting Methane Waste To Valuable Materials R.R.Chianelli, <i>MRTI</i> |
| 11:50 am | 2D-3 | Comparison Of Two Idp Technologies In Detecting And Preventing Cyber-Attacks On Microgrid Communication Networks G. K. Chalamasetty, P. Mandal, and B. Tseng, <i>UTEP</i> |

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| Session 2-E: Aerospace and Energy Materials II Session Chair: Arifur Khan, UTEP | | Room: Poplar Wyndham El Paso Airport |
| 11:10 am | 2E-1 | Zinc Oxide Thin Film Preparation By Single Solution Deposition For Perovskite Solar Cells M. F. Martinez, S. Shahriar, D. Kava, C. Sana, V. Castaneda, J. Galindo, D. R. Hodges, <i>UTEP</i> |
| 11:30 am | 2E-2 | Pyroelectric Energy Harvesting With High Curie Temperature Material Linbo₃^{SEP} J. Silva, H. Karim, MD R. H. Sarker, S. Shahriar, M. A. I. Shuvo, D. Delfin, D. Hodges, N. Love, Y. Lin , <i>UTEP</i> |
| 11:50 am | 2E-3 | Thermal Stability And Oxygen Sensor Characteristic Of Ga₂O₃ Based High Temperature Oxygen Sensors E. J. Rubio, S. Manandhar, C. V. Ramana, <i>UTEP</i> |

PARALLEL TECHNICAL SESSION III

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| Session 3-A: Additive Manufacturing III Session Chair: Cesar Garcia, LMC | | Room: Walnut Wyndham El Paso Airport |
| 1:50 pm | 3A-1 | Unified Software For Multi-Functional G-Code: A Method For Implementing Multi Technology Additive Manufacturing E. Aguilera, D. Espalin, E. MacDonald, R. Wicker, <i>UTEP</i> |
| 2:10 pm | 3A-2 | Failure Analysis Of Electron Beam Melted Ti-6Al- 4V Tensile Specimen M. S. Haque, E. Arrieta, J. Mireles, C. Carrasco, C. M. Stewart, R. B. Wicker, <i>UTEP</i> |
| 2:30 pm | 3A-3 | Multi3D System: Advanced Manufacturing With Material Handling Robotics J. L. Coronel Jr., S. Ambriz, C. Kim, D. Espalin, R. B. Wicker, <i>UTEP</i> |
| 2:50 pm | 3A-4 | Fabrication And Modeling of Smart Parts Using Electron Beam Melting Additive Manufacturing Technology R. Martinez, M. S. Hossain, J. A. Gonzalez, M. A. I. Shuvo, J. Mireles, A. Choudhuri, R. B. Wicker, Y. Lin, <i>UTEP</i> |
| 3:10 pm | 3A-5 | Development Of The Thermal Wire Embedding Apparatus For Fdm-Printed Parts D. Marquez, <i>UTEP</i> |
| Session 3-B: Emerging Technologies III Session Chair: Chunqiang Li, UTEP | | Room: Satinwood Wyndham El Paso Airport |
| 1:50 pm | 3B-1 | Development of High-Temperature Digital Image Correlation Method C. Ramirez, C. M. Stewart, <i>UTEP</i> |
| 2:10 pm | 3B-2 | Optical Second Harmonic Generation Imaging For Ferroelectric Materials Studies Y. Ding, C. Diaz-Moreno, A. Paez, Y. Wang, J. A. López, C. Li, <i>UTEP</i> |
| 2:30 pm | 3B-3 | Metamaterial Based Passive Wireless Temperature Sensor For Temperatures Up To 500° H. Karim, D. Delfin, L. A. Chavez, L. Delfin, J. Avila, C. Rodriguez, R.C. Rumpf, Y. Lin, & A. Choudhuri, <i>UTEP</i> |
| 2:50 pm | 3B-4 | Compressive Properties Of Mock Polymer Bonded Explosive Using Digital Image Correlation C. A. Catzin, C. M. Stewart, <i>UTEP</i> |
| 3:10 pm | 3B-5 | High Temperature Measurement Using Lithium Niobate Ceramic Material Md R. H. Sarker, H. Karim, R. Martinez, J. Silva, N. Love, Y. Lin, <i>UTEP</i> |

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| Session 3-C: ITAR 1 Propulsion and Energy Technologies II Session Chair: Chris Navarro, Blue Origin | | Room: Sandalwood Wyndham El Paso Airport |
| 1:50 pm | 3C-1 | Decomposition Of HAN- and ADN-Based Monopropellants R. Ferguson, E. Shafirovich, <i>UTEP</i> |
| 2:10 pm | 3C-2 | Linear Burning Rate Measurements Of Hydroxylammonium Nitrate J. Stahl, E. L. Peterse, <i>Texas A&M University</i> |
| 2:30 pm | 3C-3 | Flame Studies Of LMP-103S Decomposition Products K. Hogge, E. Flores, D. Camacho, A. Choudhuri, N. Love, <i>UTEP</i> |
| 2:50 pm | 3C-4 | Development Of A Micro-Burner For Hybrid Rocket Combustion Studies J. C. Thomas, J. Stahl, and E. L. Petersen, <i>Texas A&M University</i> |
| 3:10 pm | 3C-5 | High Test Peroxide Thruster Development J. Mona Mejia, A. Choudhuri, <i>UTEP</i> |
| Session 3-D: Energy and Sustainability III Session Chair: Angel Flores, UTEP | | Room: Orchid Wyndham El Paso Airport |
| 1:50 pm | 3D-1 | Analysis of Aerodynamics for shell eco marathon vehivle using computational fluid dynamics C. Mata, J. F. Chessa, <i>UTEP</i> |
| 2:10 pm | 3D-2 | Study Of Learning Effectiveness Of Project- Based Learning Method On Team-Based And Individual-Based Projects H. Kim, A. Akundi, Y. Lin, T. Tseng, <i>UTEP</i> |
| 2:30 pm | 3D-3 | Study Of Photolysis Rate Coefficients To Improve Air Quality Models For The El Paso-Juarez Airshed S. Mahmud, P. Wangchuk, R. Fitzgerald, W. Stockwell, D. Lu, <i>UTEP</i> |
| 2:50 pm | 3D-4 | Scenario Planning Applications For Energy Issues <i>B.A. Benedict, UTEP</i> |
| 3:10 pm | 3D-5 | Non-simultaneous DG and capacitor banks allocation in distribution networks based on economic evaluation <i>S. Sajjadi, P. Mandal, and B. Tseng, UTEP</i> |
| Session 3-E: Aerospace and Energy Matrials III Session Chair: Arifur Khan, UTEP | | Room: Poplar Wyndham El Paso Airport |
| 1:50 pm | 3E-1 | Temperature Sensing On Woven CFRP By Piezoelectric Particles R. Martinez, E. Tarango, Y. Lin, <i>UTEP</i> |
| 2:10 pm | 3E-2 | Impact Response Of Woven Composites A.Castellanos, S. Md Shariful, P. Prabhakar, <i>UTEP</i> |
| 2:30 pm | 3E-3 | Mechanical Properties Of Hot Mix Asphalt Materials At Room Temperature For Use In Aerospace Landing Applications J. G. Reyes, C. M. Stewart, <i>UTEP</i> |

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| 2:50 pm | 3E-4 | An Element Activation Approach for Modeling Electron Beam Sintering of Titanium C. Beas, J. Chessa, <i>UTEP</i> |
| 3:10 pm | 3E-5 | Artic Exposure Studies Of Vinyl Foams For Sandwich Composites C. D. Garcia , P. Prabhakar, <i>UTEP</i> |

PARALLEL TECHNICAL SESSION IV

| | | |
|---|------|--|
| Session 4-A: Propulsion and Energy Technologies III Session Chair: Abraham Trujillo, UTEP | | Room: Walnut Wyndham El Paso Airport |
| 3:50 pm | 4A-1 | 500 Lbf Liquid Methane - Liquid Oxygen Throttleable Rocket Engine Design J. Carroll, J. Candelaria, J. Trillo, C. Haynes, <i>UTEP</i> |
| 4:10 pm | 4A-2 | Design And Development Of A 1 Mw Oxy-Fuel Mhd Combustor B. Lovich, M.J. Hernandez, L. Cabrera, N. Love, <i>UTEP</i> |
| 4:30 pm | 4A-3 | Design And Test Of Regenerative Cooling Channels And Injector For A 2000 Lbf Lox/Lch4 Engine A. Sandoval, I. Lopez, L. Bugarin, J. Adams, S. Soto, A. Choudhuri, <i>UTEP</i> |
| 4:50 pm | 4A-4 | Conceptual Design And Simulation Of A Directly Heated Oxyfuel Supercritical Combustor A.Badhan, A S M A. Chowdhury, D. I. Aguilar, N. D. Love, A. R. Choudhuri, <i>UTEP</i> |
| 5:10 pm | 4A-5 | The Design Of A LOX/LCH₄ Reaction Control System Engine A. Johnson, D. Ott, P. Nunez, R. Ponce, A. Choudhuri, <i>UTEP</i> |
| Session 4-B: Emerging Technologies IV Session Chair: Samia Afrin, UTEP | | Room: Satinwood Wyndham El Airport |
| 3:50 pm | 4B-1 | Free Edge Effect In Multidirectional Laminates M.S. Islam, P. Prabhakar, <i>UTEP</i> |
| 4:10 pm | 4B-2 | Numerical Study Of High-Temperature Sco₂ Volumetric Receiver For Concentrating Solar Power System. A. Schiaffino, V. Kumar, <i>UTEP</i> |
| 4:30 pm | 4B-3 | Design Optimization Of Sandwich Core And Manufacture Through Additive Manufacturing M. Tauhiduzzaman, Md. S. Islam, P. Prabhakar, <i>UTEP</i> |
| 4:50 pm | 4B-4 | Next Generation Computing Framework For Exascale Simulations A.Chattopadhyay, VMK. Kottedda, V. Kumar, <i>UTEP</i> |
| 5:10 pm | 4B-5 | 2-D Computational Model Of A Coaxial Swirl Fuel Injector J. Aboud, B. Lovich, O. Vidana, L. Cabrera, M.J. Hernandez, N. Love, A. Choudhuri, <i>UTEP</i> |

| | | |
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| Session 4-C: ITAR 2 Propulsion and Energy Technologies IV Session Chair: Michael Everett, UTEP | | Room: Sandalwood Wyndham El Paso Airport |
| 3:50 pm | 4C-1 | Laboratory-Scale Burning Of Composite Solid Propellant Using In-Situ Synthesized Iron Oxide A. R. Demko, C. Dillier, T. Sammet, K. Grossman, S. Seal, E. L. Petersen, <i>Texas A&M University</i> |
| 4:10 pm | 4C-2 | Delivery System For Bunker J. M. Mejia, J. Holt, N. Love, A. Choudhuri, <i>UTEP</i> |
| 4:30 pm | 4C-3 | Burning Rates Of Ap/Htpb-Based Solid Rocket Propellants Containing Graphene C. A. M. Dillier, A. R. Demko, T. Sammet, K. Grossman, S. Seal, E. L. Petersen, <i>Texas A&M University</i> |
| 4:50 pm | 4C-4 | Characterization Of AF-M315E Propellant For In-Space Applications T. Belcher, J. Valenzuela, N. Love, A. Choudhuri, <i>UTEP</i> |
| 5:10 pm | 4C-5 | Modern Scanning Electron Microscopy In The Study Of Solid Propellant Combustion: Surface Structure And Elemental Identification Via Eds G. R. Morrow, A. R. Demko, E. L. Petersen, <i>Texas A&M University</i> |
| Session 4-D: Energy and Sustainability IV Session Chair: Jianguo Wu, UTEP | | Room: Orchid Wyndham El Paso Airport |
| 3:50 pm | 4D-1 | Effect Of Water And Heat Transport On Three- Phase Transient Behavior Of A PEFC A. Nandy, C. Y. Wang, <i>Northern New Mexico College</i> |
| 4:10 pm | 4D-2 | An Analysis Of A Photovoltaic Solar System Project In An Institution Of Higher Education D. N. De Hoyos, B. Tseng, A. Olivarez, <i>UTEP</i> |
| 4:30 pm | 4D-3 | Hall Effect Measurement Data V. Vidal, <i>UTEP</i> |
| 4:50 pm | 4D-4 | Hough transform based automatic segmentation of nanofibers from SEM images Z. Hu, B. Tseng, Y. Lin, J. Wu, <i>UTEP</i> |
| Session 4-E: Aerospace and Energy Materials IV Session Chair: Deidra Hodges, UTEP | | Room: Poplar Wyndham El Paso Airport |
| 3:50 pm | 4E-1 | Optimization Of Aluminum-Doped Zinc Oxide Thin Films Via Variances In Annealing Temperature V. Castaneda, S. Shahriar, C. Sana, M. Martinez, D. Kava, J. Galindo, and D. Hodges, <i>UTEP</i> |
| 4:10 pm | 4E-2 | Study Of Tungsten-Yttrium Based Coatings For Nuclear Applications G. Martínez, J. Chessa, S. Shutthanandan, T. Tevuthasan, M. Lerche, C.V. Ramana, <i>UTEP</i> |

| | | |
|---------|------|--|
| 4:30 pm | 4E-3 | Characterization And Analysis Of Structural Properties, Crystallography And Surface Potential Of Perovskite Thin Films S. Shahriar, C. Sana, V. Castaneda, M. Martinez, D. Hodges, <i>UTEP</i> |
| 4:50 pm | 4E-4 | Structural, Dielectric, And Piezoelectric Characterization Of Lead-Free Calcium And Cerium BaTiO₃ Modified J. A. Duran, C. Orozco, C. V. Ramana, <i>UTEP</i> |
| 5:10 pm | 4E-5 | Physical And Optical Properties Of Czts Spin Coating And Doctor Blade Processing D. Kava, S. Shahriar, M. Martinez, C. Sana, J. Galindo, V. Castaneda, D. R. Hodges, <i>UTEP</i> |

Session at a Glance

| Abbreviation | Title | Start Time | End Time | Location |
|--|--|-------------------|-----------------|-----------------|
| Keynote Presentation I - John Applewhite | | 8:30 AM | 9:50 AM | Rosewood |
| 1-A | Additive Manufacturing I | 9:50 AM | 10:50 AM | Walnut |
| 1-B | Emerging Technologies I | 9:50 AM | 10:50 AM | Satinwood |
| 1-C | Space Systems | 9:50 AM | 10:50 AM | Sandalwood |
| 1-D | Energy and Sustainability I | 9:50 AM | 10:50 AM | Orchid |
| 1-E | Aerospace and Energy Materials I | 9:50 AM | 10:50 AM | Poplar |
| Special | High School Info Session | 10:00 AM | 12:00 PM | AV Theater |
| 2-A | Additive Manufacturing II | 11:10 PM | 12:10 PM | Walnut |
| 2-B | Emerging Technologies II | 11:10 PM | 12:10 PM | Satinwood |
| 2-C | Propulsion and Energy Technologies I | 11:10 PM | 12:10 PM | Sandalwood |
| 2-D | Energy & Sustainability II | 11:10 PM | 12:10 PM | Orchid |
| 2-E | Aerospace and Energy Materials II | 11:10 PM | 12:10 PM | Poplar |
| Keynote Presentation II - Charles Chase | | 12:20 PM | 1:30 PM | Rosewood |
| 3-A | Additive Manufacturing III | 1:50 PM | 3:30 PM | Walnut |
| 3-B | Emerging Technologies III | 1:50 PM | 3:30 PM | Satinwood |
| 3-C | ITAR 1 - Propulsion and Energy Technologies II | 1:50 PM | 3:30 PM | Sandalwood |
| 3-D | Energy and Sustainability III | 1:50 PM | 3:30 PM | Poplar |
| 3-E | Aerospace and Energy Materials III | 1:50 PM | 3:30 PM | Orchid |
| 4-A | Propulsion and Energy Technologies III | 3:50 PM | 5:30 PM | Walnut |
| 4-B | Emerging Technologies IV | 3:50 PM | 5:30 PM | Satinwood |
| 4-C | Propulsion and Energy Technologies IV | 3:50 PM | 5:30 PM | Sandalwood |
| 4-D | Energy and Sustainability IV | 3:50 PM | 5:30 PM | Poplar |
| 4-E | Aerospace and Energy Materials IV | 3:50 PM | 5:30 PM | Orchid |
| Keynote Presentation III - Nick Gonzales | | 5:40 PM | 7:00 PM | Rosewood |

CONFERENCE ENTER ENTRANCE

REGISTRATION

SATINWOOD

SESSIONS:
1B-2B
3B-4B

SANDALWOOD

SESSIONS:
1C-2C
3C-4C

WALNUT

SESSIONS:
1A-2A
3A-4A

WILLOW/ROSEWOOD/OAKWOOD
Keynote Presentations
Breakfast/Lunch/Dinner

POSTER SESSION

ORCHID

SESSIONS:
1D-2D
3D-4D

POPLAR

SESSIONS:
1E-2E
3E-4E

BATHROOMS

EXECUTIVE
BOARDROOM
Symposium
Office

A/V THEATRE
High School Info Session

WYNDHAM MAIN ENTRANCE

Author Index

- Aboud J, 4B-5
Acuna E, 1A-2
Adams J, 1C-1, 4A-3
Aguilar D, 4A-4
Aguilera E, 3A-1
Akter T, 4E-3
Akundi A, 3D-2
Ambriz S, 3A-3, 1A-1
Arif M, 2E-2
Arrieta E, 3A-2
Avila J, 3B-3
Avila R, 2B-2
Badhan A, 4A-4
Beas C, 3E-4
Belcher T, 4C-4
Benedict B, 3D-4, 1D-2
Bugarin L, 4A-3
Cabrera L, 4B-5
Camacho D, 1C-2, 3C-3
Candelaria J, 4A-1
Carrasco C, 3A-2
Carroll J, 4A-1
Castaneda V, 4E-5, 4E-1, 4E-3, 2E-1, 1E-1, 1E-2
Castellanos A, 3E-2
Castro E, 4E-3, 1E-2
Catzin C, 3B-4
Chalamasetty G, 2D-3
Challa V, 1E-3
Chattopadhyay A, 4B-4
Chavez L, 3B-3
Chessa J, 3D-1, 4E-2, 3E-4
Chianelli R, 2D-2
Chintalapalle R, 4E-2, 4E-4, 2E-3
Choudhuri A, 1A-3, 3A-4, 3B-3, 1C-1, 4A-3, 3C-5, 2C-1, 4A-5, 2C-3, 4C-4, 3C-3, 4A-4, 4C-2, 4B-5
Choudhuri Ar, 4A-4
Chowdhury M, 1D-1
Cordova S, 2C-2
Coronel J, 3A-3, 1A-1
De Hoyos D, 4D-2
De la Torre A, 2C-1, 2C-3
De la Torre J, 1C-3
Deemer E, 4E-3
Delfin D, 2E-2, 3B-3
Delfin L, 3B-3
Demko A, 4C-1, 4C-5, 4C-3
Dillier C, 4C-1, 4C-3
Ding Y, 3B-2
Duran J, 4E-4
Echegoyen L, 4E-3, 1E-2
Espalin D, 2A-1, 3A-1, 3A-3, 1A-1
Everett M, 1C-2
Ferguson R, 3D-1
Fitzgerald R, 3D-3
Flores A, 1C-2, 1C-3
Flores E, 3C-3
Flores M, 2B-1
Galindo J, 4E-5, 4E-1, 2E-1, 1E-1, 1E-2
Galvan E, 1D-3
Garcia C, 3E-5
Garcia E, 2B-3
Garcia R, 1A-2
Gonzalez J, 1A-3, 3A-4
Gonzalez J, 2A-3
Grossman K, 4C-1, 4C-3
Gutierrez L, 2D-1
Haque M, 3A-2
Hasanul K, 2E-2
Haynes C, 4A-1
Hernandez M, 4A-2, 4B-5
Hodges D, 2E-2, 4E-5, 4E-1, 4E-3, 2E-1, 1E-1, 1E-2, 1E-3
Hogge K, 3C-3
Holt J, 1C-2, 4C-2
Hossain M, 1A-3
Hossain M, 3A-4
Hu Z, 4D-4
Islam S, 4B-1, 2B-2, 4B-3
Johnson A, 1C-1, 4A-5
Juarez J, 1D-1
Karim H, 3B-3, 3B-5
Kava D, 4E-5, 4E-1, 2E-1, 1E-1, 1E-2
Kiekintveld C, 1D-1
Kilari S, 2A-2
Kim C, 3A-3
Kim H, 3D-2

Kim N, 2A-2
Kottedda V, 4B-4
Kumar V, 4B-4, 4B-2
Lerche M, 4E-2
Li C, 3B-2
Lin Y, 1A-3, 3A-4, 3D-2, 1B-2, 4D-4, 2E-2, 3B-3, 3B-5, 3E-1, 2A-3
Lopez I, 4A-3
Lopez J, 3B-2
Love N, 2E-2, 3B-5, 4A-2, 4C-4, 3C-3, 4A-4, 4C-2, 4B-5
Lovich B, 4A-2
Lu D, 3D-3
Mahmud S, 3D-3
Manandhar S, 2E-3
Mandal P, 2D-1, 1D-3, 2D-3, 3D-5
Marquez D, 3A-5
Martinez G, 4E-2
Martinez M, 4E-5, 4E-1, 4E-3, 2E-1, 1E-1, 1E-2
Martinez R, 1A-3, 3A-4, 3B-5, 3E-1
Mata C, 3D-1
McDonald E, 3A-1
Mejia J, 3C-5, 4C-2
Mireles J, 1A-3, 3A-4, 3A-2, 2A-3
Mishra A, 1E-3
Misra R, 1E-3
Mollenhauer D, 2B-1
Moreno D, 3B-2
Morrow G, 4C-5

Motta J, 2A-1
Nandy A, 4D-1
Nunel K, 1E-3
Nunez P, 4A-5
Olivarez A, 4D-2
Orozco C, 4E-4
Ott D, 4A-5
Paez A, 3B-2
Perez M, 1A-1
Petersen E, 4C-1, 3C-2, 4C-5, 4C-3, 3C-4
Ponce R, 4A-5
Prabhakar P, 3E-5, 3E-2, 4B-1, 2B-2, 4B-3, 1A-2
Quintana J, 1B-3
Ramirez C, 3B-1
Reyes J, 3E-3
Rodriguez C, 3B-3
Rubio E, 2E-3
Rumpf R, 3B-3
Sajjadi S, 3D-5
Sammet T, 4C-1, 4C-3
Sana C, 4E-5, 4E-1, 4E-3, 2E-1, 1E-1, 1E-2
Sandoval A, 4A-3
Sarker R, 2E-2, 3B-5
Saupe G, 4E-3
Schiaffino A, 4B-2
Seal S, 4C-1, 4C-3
Shafirovich E, 2C-2, 3D-1, 3C-1
Shahriar S, 2E-2, 4E-5, 4E-1, 4E-3,

2E-1, 1E-1, 1E-2
Shariful S, 3E-2
Shutthanandan S, 4E-2
Shuvo I, 2E-2
Shuvo M, 3A-4
Silva J, 2E-2, 3B-5
Soto S, 4A-3
Stahl J, 3C-2, 3C-4
Stewart C, 3B-1, 3B-4, 2B-3, 3A-2, 3E-3
Stockwell W, 3D-3
Tarango E, 3E-1
Tauhiduzzaman M, 4B-3
Tevuthasan T, 4E-2
Thomas J, 3C-4
Trillo J, 1C-1, 4A-1
Tseng T, 3D-2, 4D-2, 1B-2, 4D-4, 2D-3, 3D-5, 2A-2
Valenzuela J, 4C-4
Vidal V, 4D-3
Vidana O, 4B-5
Wang C, 4D-1
Wang Y, 3B-2
Wangchuk P, 3D-3
Wicker R, 1A-3, 3A-4, 2A-1, 3A-2, 2A-3, 3A-1, 3A-3, 1A-1
Wu J, 1B-2, 4D-4
Yepez J, 1C-3
Zamora A, 2C-1, 2C-3



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