# HVIS2024 Schedule (09/06/2024 updated)

**Sunday, September 8**

| Time | Event | Location |
|---|---|---|
| 4:00 PM | Registration | Hotel Nikko Tsukuba |
| 6:00 PM | Welcome Reception | Hotel Nikko Tsukuba 3rd floor "JUPITER" |

**Monday, September 9**

| Time | Event | Location |
|---|---|---|
| 8:45 AM | Registration | TSUKUBA International Congress Center |
| 9:30 AM | Opening Ceremonies | Convention Hall 300 |
| 10:10 AM | **Distinguished Scientist Keynote**<br>Ceremony 10 min + Talk 40 min | Convention Hall 300 |
| 11:00 AM | Break | Conference Room 304 |
| **Technical Session I** (Session chair: Stefano Signetti)<br>**Analytical and Numerical Methodologies I** | | Convention Hall 300 |
| **Time** | **Title** | **Authors** |
| 11:20 AM | 052 - Overset Mesh Method for Arbitrary Lagrangian Eulerian Contact on Unstructured General Polyhedral Meshes | Vaughn-Kukura, Buechler, Kenamond, Shashkov |
| 11:40 AM | 083-2 - Fragmentation Prediction of A Steel Cylinder Using an Advanced Meshless Numerical Method Coupled with a Comprehensive Fracture Model Embedding Tensile and Shear Failure Modes | Nozères, Boulanger, Quirion, Collé, Limido, Bailly, Couque |
| 12:00 PM | 100 - Collisionless Electrostatic Particle-in-Cell Simulation of Rapid Target Charging Along an Unbiased Surface due to Hypervelocity Impact Plasmas | Diallo, Lau, Lee, Elschot |
| 12:20 PM | Lunch | Main Hall Lobby |
| **Technical Session II** (Session chair: Casey Uhlig)<br>**Armor/Anti Armor and Ballistic Technology / High-velocity Penetration Mechanics and Target Response I** | | Convention Hall 300 |
| **Time** | **Title** | **Authors** |
| 1:20 PM | 031 - Impact Initiation of a Semi-confined High Explosive Target by Hypervelocity Debris | Gökstorp , Andersson, Widing, Lundberg |
| 1:40 PM | 065 - Shaped Charge Jets Interaction with Passive and Reactive Armor: A Complete Multi-Scale Approach | Lebaillif, Quirion, Le Mouroux |
| 2:00 PM | 028 - Modeling and Analysis of a 66mm Shaped Charge | Miers, Peterson, Perry, Lystrom, Sweitzer |
| 2:20 PM | 049 - Shaped Charge Penetration Experiments | Daykin, Price, Harding, Harris |
| 2:40 PM | 068 - Extension of One-dimensional Penetration Model Considering Cylindrical Cavity Expansion with Johnson-Cook Hardening | Ga, Yoon |
| 3:00 PM | Break | Conference Room 304 |

| **Technical Session III** (Session Chair: Joshua Miller) | | Convention Hall 300 |
|---|---|---|
| **Analytical and Numerical Methodologies II / Spacecraft/Meteoroid Debris Shielding and Failure Analyses I** | | |
| **Time** | **Title** | **Authors** |
| 3:20 PM | 037 - Lethal Debris Creation Following Catastrophic and Sub-catastrophic Untracked Orbital Debris Impacts on Smallsats | Mancini, Williamsen, Heagy, Stellingwerf |
| 3:40 PM | 078 - Look Out for The Little Ones: On the Long-term Impact of Debris Size Distribution on Breakup | Liang, Signoracci, Fanto, Ahlers |
| 4:00 PM | 014 - Mars Sample Return Earth Entry System Uncertainty Analysis | Squire, Cabrera, Christiansen, Jenkin, Hoffman, McKown, Parker, Peterson, Sarli, Schonberg, Steward, Tulaba, Williamsen |
| 4:20 PM | 017 - Orion Artemis I as Flown MMOD Analysis | Deighton, Christiansen, Lear, Hyde |
| 4:40 PM | 011 - Tests and Simulations for an on-Orbit Micrometeoroid Detector | Chocron, Carpenter, Hackney, Enriquez-Vargas, Walker, Koets,Rose, Grimm |
| 5:00 PM | Technical Sessions End | |
| 6:00 PM | Conference Dinner | Hotel Nikko Tsukuba 1st floor "SUBARU" |

**Tuesday, September 10 (Special Session Day)**

| Time | Event | Location |
|---|---|---|
| 8:30 AM | Registration | TSUKUBA International Congress Center |
| 9:00 AM | **Keynote Session I** (Session Chair: Takashi Ozawa) | Convention Hall 300 |
| | **Presentation Title** | **Speaker** |
| | LGG Experiments to Evaluate the Probability of an Unsterilsed Particle from Mars being Returned from Phobos by the MMX Sample-Return Mission | Zoe Emerland |
| 9:40 AM | **Exhibitor Briefings** (Chair: Nobuie Konishi) | Convention Hall 300 |
| | **Exhibitors (A to Z)** | |
| | ABSTRAO | |
| | Hadland Imaging | |
| | Nobby Tech Ltd. | |
| | Photron | |
| | Scandiflash AB | |
| | Shimadzu Corporation | |
| | Specialised Imaging | |
| 11:20 AM | Break | Conference Room 304 |
| **Technical Session IV** (Session Chair: Matthew Shaeffer) | | Convention Hall 300 |
| **Special Session: Hypervelocity Phenomena Related to Planetary Protection / Asteroid Impact and Planetary Defense Technology I** | | |
| **Time** | **Title** | **Authors** |
| 11:40 AM | 056 - Development of an Experimental System for Hypervelocity Impact Sterilization Tests | Ozawa, Nomura, Iwabuchi, Arikawa, Nitta, Nakamura, Yamagishi, Fujita, Tanaka, Sugahara |
| 12:00 PM | 094 - Experiments and Biological Assays on Microorganisms Subjected to Impact Stresses | Zhao, Perez-Fernandez, DiRuggiero, Ramesh |
| 12:20 PM | 024 - Effects of Surface Topography on The Crater Formation Process of Rubble-Pile Asteroids | Yokota, Arakawa, Yasui, Shirai, Hasegawa |
| 12:40 PM | 074 - Dynamic Weakening due to Localized Thermal Softening with Application to the Formation of Hypervelocity Impact Craters | Crawford |
| 1:00 PM | Lunch | Ristrante TSUMU |

| 2:00 PM | **Poster Session** | Foyer |
|---|---|---|
| | **Title** | **Authors** |
| **Analytical and Numerical Methodologies** | | |
| | 083-1 - High-performance Computational Modeling of Hypervelocity Impacts Using a Meshless Gamma-SPH Scheme | Dakin, Collé, Limido |
| | 107 - Application of Limit State Function Method to Statistical Analysis of Ballistic Penetration | Sakai, Kumagai |
| **Asteroid Impact and Planetary Defense Technology** | | |
| | 035 - Study of the Scale Size Effect on Momentum Enhancement in Hypervelocity Impact for Rock Target | Satou, Akahoshi, Koura, Tanaka |
| | 041 - Spatial and Shape Distributions of Ejecta from Hypervelocity Impact between Rocky Projectile and Metal Target | Matsubara, Yamaguchi, Nakamura, Hasegawa |
| | 054 - Cross-sectional Observation of Craters Formed by High-velocity Impacts under Low-gravity | Kiuchi, Okamoto, Nagaashi, Yamaguchi, Hasegawa, Nakamura |
| **Fracture and Fragmentation** | | |
| | 071 - Hypervelocity Impact Damage Formation in Multilayered Transparent Target | Kawai, Hasegawa |
| **High-velocity Launchers and Diagnostics** | | |
| | 038 - Hugoniot Measurement of BK-7 Windows by Using Aluminum Impactors Launched by Explosive | Lee, Jung, Baek |
| | 058 - Digital Image Correlation on an Isentropic Compression Experiment Using a High Pulsed Power Driver | Paccou, Leblanc, Chauvin |
| | 080 - Increase of the Muzzle Velocity of a Railgun Beyond 2500 m/s | Reck, Alouahabi, Hassler, Bluntzer |
| **High-velocity Penetration Mechanics and Target Response** | | |
| | 040 - Hypervelocity Impact Testing and Simulation at the University of Padova | Lopresti, Olivieri, Giacomuzzo, Francesconi |
| | 046 - Hypervelocity Impact Experiments on Polycarbonate Targets: Cratering Efficiency and Crater Shape | Yamaguchi, Matsubara, Nakamura |
| | 048 - Modelling the Three Phases of Shaped Charge Function | Price, Daykin, Harris |
| | 055 - Ricochet Angle at Hypervelocity Impact | Gökstorp, Andersson, Gustavsson, Lundberg |
| | 091 - Perforation Hole Diameter and Ejecta from Aluminum Alloy 6061-T6 Sheets Processed by High-pressure Sliding | Nanri, Guo, Nishida, Takizawa, Yumoto, Horita |
| **Material Response (including EOS)** | | |
| | 047 - Shock Wave Propagation in Unidirectional CFRP at Different Orientations | Shah, Hazell, Wang, Escobedo |

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|---|---|---|
| **Spacecraft/Meteoroid Debris Shielding and Failure Analyses** | | |
| | 008 - pyBLOSSUM: An Open-source Python Repository for Assessing the Ballistic Limit of Spacecraft Structures under Space Debris Impact | Ryan |
| | 084 - Micrometeoroid and Orbital Debris (MMOD) Testing, Ballistic Limit Equation Definition and Risk Assessment of the Exploration Extravehicular Mobility Unit (XEMU) | Hoffman, Tulaba Jr., Hyde, Christiansen |
| | 088 - Study of Damage Modes that Cause Titanium Alloy Tanks to Fracture due to Debris Impact Based on Rupture Limit Equation | Suzuki, Higashide |
| | 090 - Establishment of Ejecta Evaluation during Hypervelocity Impact of Large Structures in Geostationary Orbit | Kitaguro, Inoue, Akahoshi, Koura, Kawamoto, Izumiyama |
| **Hypervelocity Phenomena Related to Planetary Protection** | | |
| | 061 - Development of the Light-gas Gun for Hypervelocity Impact Sterilization Tests with a Rifling Barrel | Nomura, Ozawa, Iwabuchi, Nakamura, Tanaka, Nitta, Fujita, Yamagishi |
| | 097 - Microbial Setups for Hypervelocity Impact Sterilization Tests | Iwabuchi, Miyajima, Arikawa, Ozawa, Yamagishi, Nomura, Nitta, Fujita, Nakamura |
| 3:30 PM | Break | |
| **Technical Session V** (Session Chair: Angela Stickle) | | Convention Hall 300 |
| **Asteroid Impact and Planetary Defense Technology II** | | |
| **Time** | **Title** | **Authors** |
| 3:40 PM | 092 - Ejection Angles during Hypervelocity Impacts on Flat and Spherical Targets Investigated with Hydrocode Simulations | Kurosaki, Kurosawa, Arakawa |
| 4:00 PM | 114 - Momentum Enhancement Resulting from Hypervelocity Impact into a Basalt Boulder | Lê, Moreno, Ramesh |
| 4:20 PM | 099 - Momentum Enhancement from Impacts into Crushed Basalt at 2 and 5.5 km/s, Motivated by DART | Walker, Chocron, Grosch, Durda, Marchi, Grimm, Sorini |
| 4:40 PM | 032 - Hypervelocity Impact of Three L-type Ordinary Chondrites: A Test of the Variation of $\beta$ and $Q^*_D$ with Target Porosity and Strength | Flynn, Strait, Willman, Rolling, Pytel, Wheeler-Cooney, Macke, Durda |
| 5:00 PM | 072 - Asteroid Deflection: Do Repeated Impacts in the Same Location Increase Total Momentum Transfer? | Westra, Damazo, Martinez, Housen, Lamberson |
| 5:20 PM | Technical Sessions End | |
| | Dinner | on your own |

**Wednesday, September 11**

| Time | Event | Location |
|---|---|---|
| 8:30 AM | Registration | TSUKUBA International Congress Center |
| **Technical Session VI** (Session Chair: Christopher Cline II) | | Convention Hall 300 |
| **Spacecraft/Meteoroid Debris Shielding and Failure Analyses II** | | |
| **Time** | **Title** | **Authors** |
| 9:00 AM | 013 - Smooth Particle Hydrodynamic Code Predictions for Meteoroid Damage to Thermal Protection Systems Shielded by Composite Structures | Corbett, Joel Williamsen, Stellingwerf, Squire |
| 9:20 AM | 007 - Extending the Applicability of Thermal Protection System Ballistic Limit Equations Beyond the Testable Regime | Schonberg, Squire |
| 9:40 AM | 009 - General Ballistic Limit Equations for Whipple Shields against Low- and High-density Meteoroid Surrogates | Miller, Davis, Deighton |
| 10:00 AM | 026 - Physics-informed Machine Learning for Predicting the Ballistic Limit of Whipple Shields | Ryan, Le, Berk, Kumar, Venkatesh |
| 10:20 AM | 045 - The Application of Artificial Intelligence and Deep Learning to Visually Identify Micrometeoroid and Orbital Debris Impacts | Collins, Lear, Fisher |
| 10:40 AM | Break | Conference Room 304 |
| **Technical Session VII** (Session Chair: Justin Wilkerson) | | Convention Hall 300 |
| **High-velocity Penetration Mechanics and Target Response II** | | |
| **Time** | **Title** | **Authors** |
| 11:00 AM | 089 - Ballistic Limit Velocity and Impact Energy Absorption from Microns to Millimeters | Rogers, Xaio, Mead, Pittman Jr., Thomas, Wilkerson, Lacy Jr. |
| 11:20 AM | 027 - Evaluation of Debris Impact on AO-resistant Film | Kimoto, Kubo, Umeda, Hasegawa |
| 11:40 AM | 033 - Laser Simulation of Hypervelocity Impact into Porous Graphite | Aubert, Hébert, Rullier, Lescoute, Videau, Berthe |
| 12:00 PM | 036 - Laser-driven Cratering into Porous Graphite: Experimental Investigation on Ejecta Distribution | Reynier, Jodar, Geral, Lescoute, Le Bras, Taddei, Chevalier, Hebert, Arrigoni |
| 12:20 PM | 018 - Momentum Transfer During Laser-driven Cratering Experiments | Hébert, Le Bras, Reynier, Aubert, Chevalier, Lescoute, Boutoux, Jodar, Géral, Loison, Videau, Taddei, Arrigoni, Berthe |
| 12:40 PM | Technical Sessions End | |
| | Lunch (box lunches served) | |
| 1:30 PM | Excursion | JAXA Tsukuba Space Center |
| 6:30 PM | Symposium Banquet | Hotel Grand Shinonome 2nd floor "ARIAKE" |

**Thursday, September 12**

| Time | Event | Location |
|---|---|---|
| 8:30 AM | Registration | TSUKUBA International Congress Center |
| 9:00 AM | **Keynote Session II** (Session Chair: Kumi Nitta) | Convention Hall 300 |
| | **Presentation Title** | **Speaker** |
| | Measurements of the Failure of Composite Overwrapped Pressure Vessels by Direct Impact | Joshua Miller |
| **Technical Session VIII** (Session Chair: Yasuhiro Akahoshi) | | Convention Hall 300 |
| **High-velocity Launchers and Diagnostics** | | |
| **Time** | **Title** | **Authors** |
| 9:40 AM | 050 - Dynamic Tensile Extrusion of 0.25 and 0.30 Caliber Hypervelocity Projectiles | Uhlig, Coppinger, Wilmer, Berning |
| 10:00 AM | 042 - Erosion from Hypervelocity Impacts with Simultaneously Launched Particles | Moreno, Shaeffer, Slingluff, Rhim, Brown, Ramesh |
| 10:20 AM | 101 - A Comprehensive Optimization Study for Increasing Output Velocity and Minimizing Erosion in Small Caliber Two-stage Gas Guns | Rodriguez, Sandy, Rodriguez, Golson, Cone, Rios |
| 10:40 AM | 104 - A Laser Driven Gun for the Launch of Sub Millimetre Projectiles | Edwards and Rothman |
| 11:00 AM | Break | Conference Room 304 |
| **Technical Session IX** (Session Chair: David Price) | | Convention Hall 300 |
| **Fracture and Fragmentation I** | | |
| **Time** | **Title** | **Authors** |
| 11:20 AM | 010 - In-situ Imaging of Spall Fracture | Diamond, Moreno, Zhao, Ramesh |
| 11:40 AM | 093 - Crack Propagation Process by Stress Waves in Pre-cracked Glass Plate Subjected to Hypervelocity Impact of Debris | Nagano, Kawai, Hasegawa, Yoshida, Sato |
| 12:00 PM | 067 - Pellet Shattering Process for the ITER Disruption Mitigation System – Part I: Development of a Discrete Element Code for Modeling the Dynamic Fragmentation of Cryogenic Materials | Signetti, Matura, Murillo, Durr, Büttner, Watson, Moser, Gebhardt, Jachmich, Lehnen, Kruezi |
| 12:20 PM | 063 - Pellet Shattering Process for the ITER Disruption Mitigation System – Part II: Synthetic-diagnostics-based Fragment Tracking, Calibration, and Validation of Simulation Models | Matura, Signetti, Moser, Gebhardt, Watson, Schindler-Tyka, Murillo, Durr, Büttner, Jachmich, Lehnen, Kruezi |
| 12:40 PM | Lunch | Main Hall Lobby |
| **Technical Session X** (Session Chair: James Walker) | | Convention Hall 300 |
| **Material Response (including EOS) / Fracture and Fragmentation II** | | |
| **Time** | **Title** | **Authors** |
| 1:40 PM | 073 - Development of Back-face Coatings for the Characterization of Non-reflective and Opaque Materials by Laser Shocks | Le Mouroux, Lebaillif, Berthe, Viot, Girardot |
| 2:00 PM | 113 - Validation of Hypervelocity Impact Induced Damage and Fragmentation Models for Silicon Carbide | Morton, Lamberson |
| 2:20 PM | 043-1 - Computational Analysis of Thermal Hypervelocity Impact Experiments | Hopson, Edgerton |
| 2:40 PM | 043-3 - Fracture Calculations Using Measurement based Statistical Strength and Non-local Failure | Hopson, Scott, Stershic, Alexander |
| 3:00 PM | 015 - Using Plate-impact-driven Ring Expansion Tests (PIDRET) to Assess Analytical Models | Seisson, Gant, Longère, El Maï, Zinszner |
| 3:20 PM | Break | Conference Room 304 |

**Technical Session XI** (Session Chair: Michael Squire) Convention Hall 300

**Analytical and Numerical Methodologies III / Spacecraft/Meteoroid Debris Shielding and Failure Analyses III**

| Time | Title | Authors |
|---|---|---|
| 3:40 PM | 075 - Fragment Impact Debris Morphology as a Function of Impact Conditions | Hertel, Garcia, Cole |
| 4:00 PM | 079 - Shape Effect of Non-Spherical Projectiles on CFRP Spacecraft Structures | Watson, Putzar, Durr, Sharma, Murillo, Schimmerohn |
| 4:20 PM | 034 - Creation of Lethal Debris from Meteoroid and Orbital Debris Impacts on LEO Solar Array Materials | Yi, Williamsen, Stellingwerf, Pechkis |
| 4:40 PM | 106 - On the Effect of Projectile Material on Damage Induced to Single and Multi-plate Target | Abdulhamid, Mespoulet, Deconinck |
| 5:00 PM | 025 - Preliminary Experimental Investigation of Multi-Shock Shield Performance against Meteoritic and Other Lithic Projectiles | Cline II, Christiansen, McCandless, Miller, Davis, Resendez |
| 5:20 PM | 110 - The Emission of Nonthermal Electromagnetic Radiation by Colliding Space Debris | Akhavan-Tafti, Renno, Crawford, Zhang, Backhus, Atilaw |
| 5:40 PM | Technical Sessions End | |
| | Dinner | on your own |
| 6:30 PM | (Board Dinner) | (Tsukuba Sansuitei) |

**Friday, September 13**

| Time | Event | Location |
|---|---|---|
| 8:30 AM | Registration | TSUKUBA International Congress Center |
| **Technical Session XII** (Session Chair: Shannon Ryan)<br>**High-velocity Penetration Mechanics and Target Response III** | | Convention Hall 300 |
| **Time** | **Title** | **Authors** |
| 9:00 AM | 087 - Polyethylene's Response to Hypervelocity Impacts at Critical Transition Temperarures | Rogers, Mote, Davis, Mead, Pittman Jr. , Thomas , Wilkerson, Lacy Jr. |
| 9:20 AM | 077 - Failure Modes of CFRP Panels under Hypervelocity Impact: the Effects of Strain Rate Between 1 km/s and 6 km/s | Lawrence, Painter, Iordachescu, Footer, Seabright, Appleby-Thomas |
| 9:40 AM | 057 - Effects of Electron Beam and Atomic Oxygen Irradiation on Hypervelocity Impact Fracture Behavior of Polyimide CFRP | Nishida, Ashida, Ziyi, Ishida, Higashide |
| 10:00 AM | 085 - Flash X-ray Investigation of Ejecta Developed during High-velocity Impact into Boron Carbide | Muly, Moreno, Ramesh |
| 10:20 AM | 069 - Probing the Evolution of Solid Microjets from Grooved Sn Sample Using X-ray Radiography: Evidence of Coalescence Edge Effects | Burie, de Mingo, Chevalier, Auperin, Lerévérend, Imbert, Youinou, Requardt, Foster, Lukic, Sollier |
| 10:40 AM | Break | Conference Room 304 |
| **Technical Session XIII** (Session Chair: Masahiro Nishida)<br>**Spacecraft/Meteoroid Debris Shielding and Failure Analyses IV** | | Convention Hall 300 |
| **Time** | **Title** | **Authors** |
| 11:00 AM | 019 - A Numerical Method of Mesoscopic Metallic Foam under Hypervelocity Impact | Tang, Chen |
| 11:20 AM | 066 - SPH Modeling of Ultra High Molecular Weight Polyethylene Plate in Hypervelocity Impact | Chubachi, Shimizu, Akiyama, Makihara |
| 11:40 AM | 096 - Hypervelocity Impact on Whipple Shields with Varying Bumper Material at 7 km/s: An Experimental Study | Færgestad, Davis, Cline II, Christiansen, Ford, Hopperstad, Holmen, Børvik |
| 12:00 PM | 095 - Evaluation of the AFRP Durability against Debris Cloud Impacts within Multiple-layered Bumper Shield Structures | Sano, Ishibashi, Ito, Iwata, Hasegawa, Wozniakiewicz, Alesbrook, Appleby-Thomas, Arai, Yano |
| 12:20 PM | 098 - Design Verification of Whipple Bumper Shields for Protecting Small Spacecraft from Hypervelocity Impacts during Fast Fly-bys to Dusty Objects | Yano, Arai, Ishibashi, Miyazaki, Satoh, Sano, Ito, Iwata, Wozniakiewicz, Alesbrook, Appleby-Thomas, Hasegawa, Funase |
| 12:40 PM | Technical Sessions End | |
| 12:50 PM | HVIS Business Meeting (box lunches served) | Convention Hall 300 |
| 1:50 PM | Symposium Adjourns | |