18th International Symposium for the Interaction of Munitions with Structures

2019

Panama City Beach, FL
October 21-25

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Welcome Letter

The University of Florida, and the ISIEMS Technical Program Advisory Committee, welcome you to the 18th International Symposium on the Interaction of the Effects of Munitions with Structures (ISIEMS) on Florida's beautiful Emerald Coast. While engaging in the outstanding technical program, we invite everyone to enjoy our emerald-green waters, white sandy beaches, and world-famous Southern hospitality that provide the backdrop to the United States' premiere location for the design of survivable military infrastructure and future munitions concepts.

Senior researchers in our field have recounted that the earliest ISIEMS conferences alternated between Panama City, Florida, in the United States, and Mannheim in Germany. For the 18th ISIEMS Symposium, we make a historic return to Panama City to continue a rich tradition of collaboration and technical discussion. This symposium promises to be a week of connecting with and learning from partners and leaders in the field of munitions and structures through a series of papers, presentations, and in-depth discussions. Our goal for this symposium is to expose attendees to the international state-of-the-art in weapons effects upon infrastructure, highlight your contributions and interests to the broader research community, and facilitate networking amongst our research peers.

Locally, Tyndall Air Force Base hosts the Air Force Civil Engineering Center and the 325th F-22 Fighter Wing, as well as several other units. Additionally, the Naval Surface Warfare Center, Panama City Division, is an engineering development center for missions in the littoral (shore line) battlespace. Military neighbors include: Eglin Air Force Base, home of the Army Ranger School, the Navy Explosive Ordnance Demolition School, the Air Force F-35 International School, 96th Test Wing Development and Operational Weapons Testing, and the Air Force Research Laboratory Munitions Directorate.

In addition to the University of Florida, we are supported by numerous other universities and colleges to include: Florida State University, Auburn University, University of West Florida, North West Florida State College, Georgia Institute of Technology, Gulf State College, Troy State University, Tuskegee University, and Embry-Riddle Aeronautical University.

The ISIEMS Technical Program Advisory Committee

General Information

Dates:
Monday, October 21 – Friday, October 25, 2019

Meeting Site:
Sheraton Bay Point
4114 Jan Cooley Dr., Panama City Beach, FL 32408
Toll Free: (866) 912-18042 FREE Local: (850) 236-6000 Fax: (850) 236-6158

Registration/Check-in:
Please register/check-in at the Registration Desk in front of the St. Andrews Ballroom to receive your name badge and conference materials. Below are the registration hours:

Monday, October 21st: 1600-1800
Tuesday, October 22nd: 0700-1700
Wednesday, October 23rd: 0700-1400
Thursday, October 24th: 0700-1600
Friday, October 25th: 0700-1140

Transportation and Parking:
Self-parking is free for guests and non-guests of the Sheraton Bay Point.
Please note: If you are not staying at the Sheraton Bay Point, you will be responsible for your own transportation to and from the conference.

Conference Special Events:

Monday, October 21st, 2019

Welcome Reception* - 1800-2100
Sheraton Bay Point – St. Andrews Pavilion

Join us for an evening of Hors d 'Oeuvres and beverages to kick off the 18th International Symposium for the Interaction of the Effects of Munitions with Structures!

*Please note that the Welcome Reception is included with your registration. If you'd like bring a guest to the Welcome Reception/Banquet, a Guest Fee of $150 is available for purchase at the ISIEMS registration desk.

General Information

Wednesday, October 23rd, 2019

Tyndall Air Force Base Tour – 1300-1700

Bus transportation to and from the base will be provided for those who registered for the Air Force Base Tour. Please meet in the Foyer outside of St Andrews Ballroom at 1300.

NOTICE- ISIEMS Tyndall Tour Attendees,

All foreign nationals (non-US citizens) attending the ISIEMS Tyndall Tours must go through their country's embassy to complete paperwork necessary for a foreign visit request to a U.S. military base (Tyndall Air Force Base, FL).

All US citizens must provided passport or other government ID to participate in this tour.

Any attendee who has not filled out the proper paperwork or does not have proper identification will be able to attend an alternative tour, which will drive past the base and the hurricane affected areas.

U.S. Government Sponsor: Mr. Brian Skibba or Major John Stiles
Phone: 850 283 6170/520-275-5998

ISIEMS Banquet*

Sheraton Bay Point – St. Andrews Ballroom CD

*Please note that the Banquet is included with your registration. If you'd like to bring a guest to the Banquet, please visit the ISIEMS registration desk no later than Tuesday at 10am to purchase a Guest Banquet ticket.

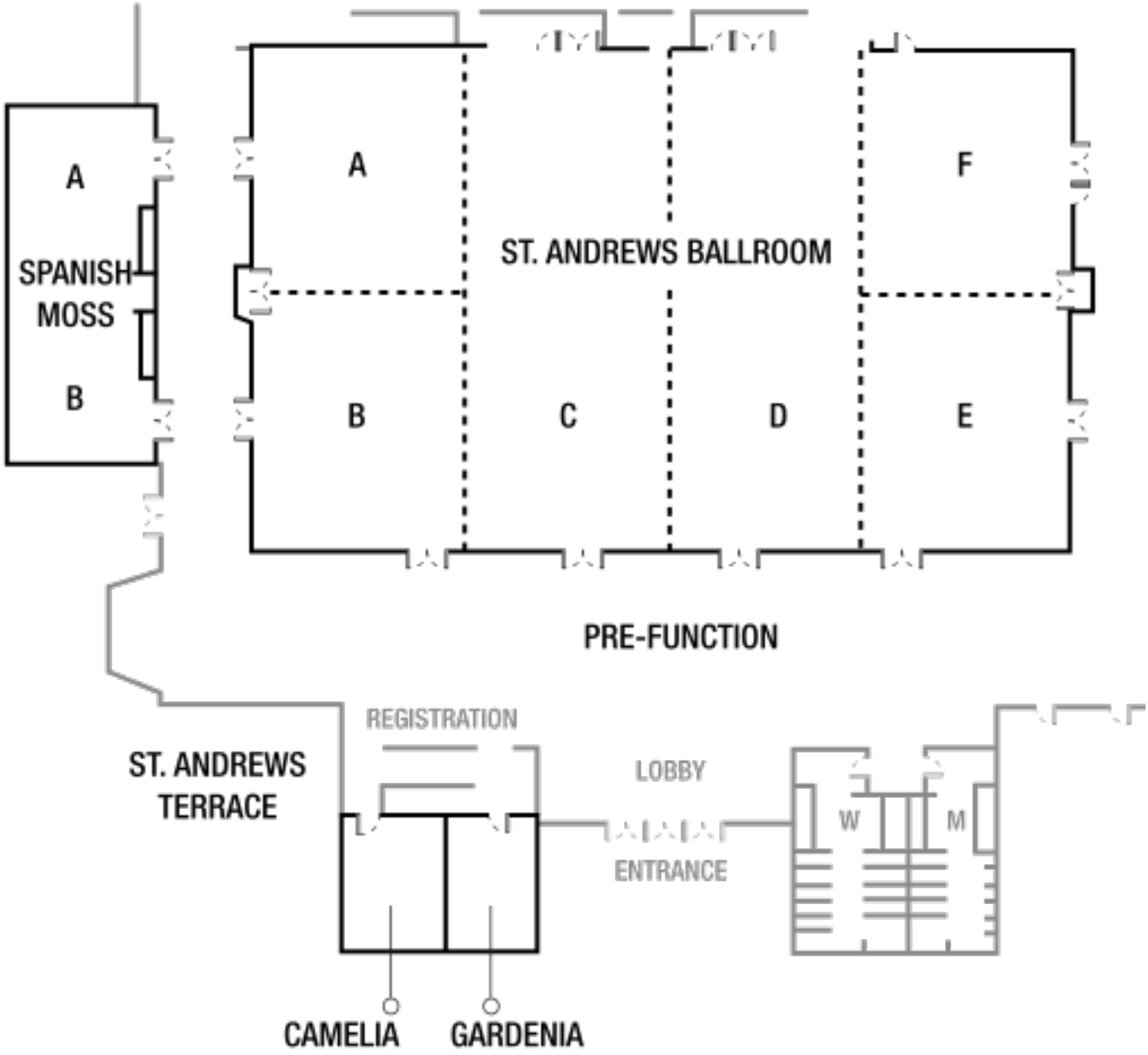
Thursday, October 24, 2019

Captain Anderson's Sunset Cruise – 1640-2000

Bus transportation to and from Captain Anderson's Sunset Cruise will be provided for those who registered for the tour. Meet in the Foyer outside of St Andrews Ballroom at 1640.

Conference Center Map

Registration – ISIEMS Registration/Check-In
St. Andrews Ballroom CD – General Sessions & Meals
St. Andrews Ballroom AB – Technical breakout sessions (Open to all attendees)
St. Andrews Ballroom EF – Technical breakout sessions (Open to all attendees)
Spanish Moss – NATO breakout sessions (NATO registration and attendance form required)
St. Andrews Pavilion (not pictured; located outside conference area) – Welcome Reception



Conference Agenda

Monday, October 21, 2019			
16:00-18:00	Registration		
18:00-21:00	Reception on St. Andrews Pavilion		
Tuesday, October 22, 2019			
7:00-8:00	Registration		
8:00-9:40	Opening Ceremony, Dr. Singer Keynote		
9:40-10:00	Coffee Break		
Location	**Ballroom AB**	**Ballroom EF**	**Spanish Moss**
Session 10:00-11:40	**Blast 1** **Session Chair: Vincent Chiarito**	**Protec-Blast** **Session Chair: Eric Scarborough**	**MOUT Overview** **Session Chair: Holger Sohn**
11:40-13:00	Lunch		
Session 13:00-14:40	**Blast 2** **Session Chair: Joel Stewart**	**Protec-Blast 2** **Session Chair: Lt. Col. Stephen Hagen**	**MOUT- Blast** **Session Chair: Brett Sorensen**
14:40-15:00	Coffee Break		
Session 15:00-16:40	**Blast 3** **Session Chair: Catherine Stephens**	**Protec-Blast 3** **Session Chair: Joseph Baum**	**MOUT- M&S** **Session Chair: Ernest Staubs**
Wednesday, October 23, 2019			
7:00-8:00	Registration		
Session 8:00-9:40	**Blast, M&S, Load Response, Penetration** **Session Chair: Andreas Doerr**	**Protec- Mat Prop** **Session Chair: Col. Andreas Goldbach**	**MOUT Penetration** **Session Chair: Albrecht Bongartz**
9:40-10:00	Coffee Break		
Session 10:00-11:40	**Penetration/Combined** **Session Chair: Bryan Bewick**	**Protec-Mat Prop 2** **Session Chair: Omar Esquillin-Mangual**	**NATO-Blast** **Session Chair: Kent Danielson**
11:40-13:00	Lunch		
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18:00-21:00	Banquet Dinner		
Thursday, October 24, 2019			
7:00-8:00	Registration		

Conference Agenda

Session 8:00-9:40	**Shock/SR** **Session Chair: Alan Pearson**	**Risk Mgmt** **Session Chair: Scott Frank**	**SHIELD 1** **Session Chair: Denis Rickman**
9:40-10:00	Coffee Break		
Session 10:00-11:40	**SR** **Session Chair: Roosevelt Davis**	**Tool** **Session Chair: Catherine Stephens**	**SHIELD 2** **Session Chair: Denis Rickman**
11:40-13:00	Lunch		
Session 13:00-14:40	**SR-M&S** **Session Chair: Andreas Doerr**	**Penetration** **Session Chair: Keri Bailey**	**SHIELD 3** **Session Chair: Denis Rickman**
14:40-15:00	Coffee Break		
Session 15:00-16:40	**Antiterrorism/Blast/Tool** **Session Chair: Stefan Greulich**	**Protec-Soil/Tool/Overburden/ Mun storage** **Session Chair: Sarah Vorgert**	**NATO- Blast, Protec, Multi Det** **Session Chair: Richard Summers**
16:40-20:00	Load buses for Captain Anderson's Sunset Cruise- 16:40 Tour- 17:00-20:00		
Friday, October 25, 2019			
7:00-8:00	Registration		
Session 8:00-9:20	**SR-Columns/RCCol/UHPC /Model Approach** **Session Chair: Alan Ohrt**		**NATO-Localized, Protec, Risk Mgmt, Tool** **Session Chair: Ernest Staubs**
9:20-10:00	Coffee Break		
10:00-11:20	Closing Session		

Paper Schedule

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Location	**Ballroom AB**	**Ballroom EF**	**Spanish Moss**
Session	**Blast 1** **Session Chair: Vincent Chiarito**	**Protec-Blast** **Session Chair: Eric Scarborough**	**MOUT Overview** **Session Chair: Holger Sohn**
10:00-10:20	**Gran, Jim** Effects Of Elevated Ambient Pressure On Explosive Blast In A Sealed Pipe	**Jonet, Arnaud** Blast Mitigation Using Mineral Foam As Sacrificial Claddings	**Staubs, Ernest** Overview Of Joint Weapon Effects Research
10:20-10:40	**Stewart, Joel** Explosively Driven Shock Tube Investigations	**Maazoun, Azer** New Technique To Protect RC Slabs Against Explosions Using CFRP As Externally Bonded Reinforcement	**Rohen, Karl** 3D Measurement (As Built Measurement) And Surface Model Of The Entire "Bunker Ladeburg" Complex
10:40-11:00	**Trélat, Sophie** Reduced-Scale High Explosive Charges: A Joint Experimental Work To Study Free-Field Blast Effects	**Eytan, Reuben** Practical Experience In The Optimal Implementation Of "Invisible" Hardening Measures In Buildings	**Doerr, Andreas** Experimental Explosive Crater Analysis With Cast
11:00-11:20		**Ichino, Hiroyoshi** An Experimental Study On Blast Mitigation Layers Composed Of EPS Plate And Soil	
11:20-11:40		**Blanc, Ludovic** Experimental And Numerical Investigation On Load Impulse Reduction With A Sandwich Add-On Armour	
11:40-13:00	Lunch		
Session	**Blast 2** **Session Chair: Joel Stewart**	**Protec-Blast 2** **Session Chair: Lt. Col. Stephen Hagen**	**MOUT- Blast** **Session Chair: Brett Sorensen**
13:00-13:20	**Edri, Idan E.** TNT Equivalency Of Different Explosives In A Confined Space	**Chee, Min Hui** Reinforced Concrete Panels Retrofitted With Fibre Reinforced Polymers And Subjected To Near-Field Blast And Fragmentation Effects	**Ohrt, Alan** Observed Casing Effects From A Heavily-Cased Explosive Cylinder

Paper Schedule

13:20-13:40	**Clutter, Keith** Strategy For Modeling Non-Ideal Explosives	**Rebelo, Hugo** 3D Printed PLA Sacrificial Honeycomb Cladding Blast Mitigation	**Bewick, Bryan** Response Of Adobe Structures Subjected To Internal Blast Loads
13:40-14:00	**Clutter, Keith** Near-Field Dynamics Affecting Loading From Ideal Explosives	**Baum, Joseph** Modeling of a Blast Wave Interaction With A Cloud Of Droplets	**Davis, Roosevelt** Airblast Influences Of Doors In A Multi-Room Structure
14:00-14:20	**Ng, Chor Boon** Urban Canyon Explosive Testing To Investigate Effects of Glazing Response And Blast Propagation	**Hall, Elise** Optical Diagnostics for Cased Explosive Model Validation and Fragment Measurements	**Rossberg, Daniel** Comparison Of Fast Running Simulations With Reguard To Blast
14:20-14:40	**Remennikov, Alex** Performance Characterisation And Further Development With NFPBS' Advanced Blast Simulator		**Froechtenicht, Maik** Validation Of Apollo CFD-Code Using Small Scale Tests Of Internal Detonations
14:40-15:00	Coffee Break		
Session	**Blast 3** **Session Chair: Catherine Stephens**	**Protec-Blast 3** **Session Chair: Joseph Baum**	**MOUT- M&S** **Session Chair: Ernest Staubs**
15:00-15:20	**Langran-Wheeler, Christian** Reflected Blast Loads From Long Cylinders In The Near-Field	**Mourão, Rodrigo** Experimental Assessment Of Concrete With Bonded FRP Under Contact Explosion	**Scarborough, Eric** A Comparison Of Simulating Multiple Fragment Impacts
15:20-15:40	**Clutter, Keith** Prediction Of Blast Pressure From Explosions With Aluminum Powder	**Dalenius, Rolf** The Influence Of Height Of Charge On Blast Loads Behind A Shielding Wall	**Rohen, Karl** Precision 2D Assessment System Of Fragment Holes In Witness Plates
15:40-16:00	**Wholey, Will** CFD Investigation Of Blast Pressure Ingress And Interior Distribution In Structures Subjected To External Blast Loading And Development Of Improved Simplified Calculation Parameters For Assessment Of Blast Injury	**Pezzola, Genevieve** Prototype Testing Of The Expedient Retrofit For Existing Buildings (EREB) System	**Minkoff, Sarah** Modeling Complex Structural Environments Using Petra
16:00-16:20	**Bogosian, David** Consequences Of Applying Objective Methods For Selecting Peak Pressure From Experimental Data	**Langdon, Genevieve** Influence Of Venting Configuration On The Deformation And Rupture Of A Scaled Aircraft Luggage Container Subjected To Internal Blast Loading	**Froechtenicht, Maik** Estimating Fragment Scabbing Volumes of a Detonation Room From LIDAR Scans
16:20-16:40	**Josey, Tyson** Advances in Blast Simulator Technology		**Staubs, Ernest** Research Into Secondary Debris And Its Potentially Damaging Effects

Paper Schedule

Wednesday, October 23, 2019			
7:00-8:00	Registration		
Session	**Blast, M&S, Load Response, Penetration** **Session Chair: Andreas Doerr**	**Protec- Mat Prop** **Session Chair: Col. Andreas Goldbach**	**MOUT Penetration** **Session Chair: Stefan Greulich**
8:00-8:20	**Dalenius, Rolf** Diffraction Effects Of Blast Waves Around Corners	**Esquilin-Mangual, Omar** Experimental Evaluation Of The Impulse Reduction By Plywood And Insulated Foam Panels As Triggering Materials And Implementation On A Fast-Running Tool	**Danielson, Kent** Deformable Fragment And Projectile Penetration Modeling With Resistance Functions
8:20-8:40	**Klomfass, Arno** A Universal Co-Simulation Interface For Blast-Loading Of Structures	**Kilmenko, Jessica** Effect Of Adhesion Level On The Post-Fracture Response Of Laminated Glazing Systems Subjected To Blast Loads	**Greulich, Stefan** Recent Developments In Penetration Methodologies – An Update
8:40-9:00	**Astarlioglu, Serdar** Influence Of Load Waveform On Pressure-Impulse Diagrams Of Normal And High-Strength Concrete Panels	**Li Piani, Tiziano** Dynamic Increase Factors For Adobe: Predicting The Dynamic Strength In Compression For Earthen Materials	**Sauer, Christoph** Modelling The Penetration Into UHPC And FRC – Force Law Development Based On Hydrocode Simulations
9:00-9:20	**Vankirk, George** The Effects Of Concrete Damage On Projectile Penetration: A Computational Study Using The HRB Model and The Epic Hydrocode	**Kai Qi, Tan** Blast Effects On Pavement Sections	**Bongartz, Albrecht** More Joint Effect Testing For Shoulder-Fired Weapons Against Infrastructure Targets
9:20-9:40	**Josey, Tyson** Further Development and Applications of the PVCG Blast-Source Model	**Fryman, Brandon** Hazardous Fragment Distance and Maximum Throw Comparison	**Bailey, Keri; Sarrach, Thorsten; Bucksch, Martin** US/GE Joint Penetration Experiments Against Advanced Strength Concretes
9:40-10:00	Coffee Break		
Session	**Penetration/Combined** **Session Chair: Bryan Bewick**	**Protec-Mat Prop 2** **Session Chair: Omar Esquillin-Mangual**	**NATO-Blast** **Session Chair: Kent Danielson**
10:00-10:20	**Rouquand, Alain** A Methodology To Simulate Combined Blast And Fragment Effects On Reinforced Concrete Structures	**Pereira, Luis** A Numerical Study Of Ballistic Impacts On Normal And High-Performance Concrete	**Vorgert, Sarah** Experiments Investigating External Venting Of Internal Detonations In A Small Scale Structure

Paper Schedule

10:20-10:40	**Agrawal, Ankit** Designing for Combined Effects Of Air-Blast, Fragments, And Fire	**Magallanes, Joe** High Strain-Rate Behaviors And Modeling Of Structural Steels For Protective Structures	**Vorgert, Sarah** Experimental Investigation Of Simultaneous Versus Independent Detonations Of Distributed Explosive Charges
10:40-11:00	**Soto, Orlando** Numerical Modeling Of Fragment And Blast Loaded Concrete Structures Using Massively-Parallel Coupled Cfd-Csd Techniques	**Davidson, James** Effects Of Masonry-Mortar Bond Strength On The Blast Load Response Of Masonry Walls	**Turton, James** Blast In A Multi-Room Structure
11:00-11:20		**Smith, Zach** Cable Shields – Protecting Bridge Cable from Terrorist Attacks	**Petrovitch, Christopher** Blast Propagation Through Rapidly Breached RC Walls
11:20-11:40			
11:40-13:00	Lunch		
13:00-18:00	Load Buses for Tour- Leave at 13:30 Tyndall Tour- 14:30-16:30 Load Buses to Leave- 16:30-17:00 Arrive at Hotel- 18:00		
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Session	**Shock/SR** **Session Chair: Alan Pearson**	**Risk Mgmt** **Session Chair: Scott Frank**	**SHIELD 1** **Session Chair: Denis Rickman**
8:00-8:20	**Stone, Michael** An Energy Flow Approach For Assessing NSC And UHPC Cylinders Under Static And Impact Loads	**Hagen, Stephen** The Contribution Of Research Products To The Command And Control Process Regarding Structural Protection In Deployed Operations	**Knutson, Tor** Shield Management Summary/ Shield Test Execution Summary
8:20-8:40	**Edri, Idan** Dynamic Response Characteristics Of Arching Masonry Walls Under Blast Loading	**Ornai, David** Protective Cable Net Structure Against Drones And Munitions	**Cavelti, Balz (CHE)** CHE Passive Modular Protection System For Peace Support Missions Exposed To Very Large Air Blast
8:40-9:00	**Schmitt, Daniel** Investigations On Soil Filled Perimeter Walls Under Blast Loading	**Johnsson, Fredrik** Explosive Remnants – A Multifaceted Risk Problem	**Nussbaumer, Peter (CHE)** Whole-Body Displacement Due To Blast Loads
9:00-9:20		**Ingier, Petter Toensberg** Stacked Fragmenting Casings	**Nussbaumer, Peter (CHE)** Behaviour Of Swiss Brick Walls Subjected To Blast Loads

Paper Schedule

9:20-9:40		**Turgyan, Scott** Effects of Weaponized Commercial Unmanned Aerial Vehicles (UAVs) on Structures, and Comparison of Analysis Methods	**Dirlewanger, Hans (DEU)** Effect Of A Heavy Improvised Explosive Loading On Blast Protection Walls
9:40-10:00	Coffee Break		
Session	**SR** **Session Chair: Roosevelt Davis**	**Tool** **Session Chair: Catherine Stephens**	**SHIELD 2** **Session Chair: Denis Rickman**
10:00-10:20	**Andrae, Matthias** Explosions Against Full Scale Conventional And Hardened Houses Made Of Masonry, Reinforced Concrete And Steel	**Susi, Bryan** Scalable Fidelity CFD Simulations For Decision Support Applications	**Dirlewanger, Hans (DEU)** Effect Of A Super Heavy Improvised Explosive Loading On Wall Systems And Accommodation
10:20-10:40	**Roller, Christoph** Dynamic Bearing Capacity Of Reinforced Concrete Plates Subjected To Blast Loading,		**Burbach, Albert (DEU)** Effect Of A Super Heavy Improvised Explosive Loading On Reinforced Concrete Emplacements
10:40-11:00	**Puryear, John** Validation Of A Cold-Formed Steel Stud Wall Finite Element Model Against Blast Test Measurements		**Dalenius, Rolf (SWE)** Impact of Different Charge Configurations
11:00-11:20	**Pope, D.J.** Predicting Near-Field Specific Impulse Distributions Using Machine Learning		**Johansson, Erik (SWE)** Seismic and Infrasound Measurements at SHIELD
11:20-11:40			**Persson, Anders (SWE)** Effects of Blast on Anthropometric Test Devices
11:40-13:00	Lunch		
Session	**SR-M&S** **Session Chair: Andreas Doerr**	**Penetration** **Session Chair: Keri Bailey**	**SHIELD 3** **Session Chair: Denis Rickman**
13:00-13:20	**Caçoilo, Andreia** Pressure-Impulse Blast Response Of Steel Iso Containers	**Atoui, Oussama** Numerical Investigation Of High Strength Aluminum Alloy Subjected To High Velocity Impact By A Rigid Spherical Projectile	**Grue, Tormond (NOR)** Triple-layered Laminated Glass Panes Exposed to Blast Loading
13:20-13:40	**Rakvåg, Knut** Reaction Forces Of Dynamically Loaded Beams	**Beppu, Masuhiro** A Study On Perforation Failure Of Steel Plates Subjected To Impact	**Heggelund, Solveig (NOR)** Global Response Of A Four-Story Concrete Structure Exposed To Blast Loading – Preliminary Results

Paper Schedule

13:40-14:00	**Luna, Arturo** Determining The Effect Of Weak Horizontal Shear Planes On Composite Flexural Systems Subjected To Blast Loading Using Fundamental Structural Analysis	**Remennikov, Alex** An Experimental Investigation Of The Penetration Of Multiple Spaced Hybrid Panels By Explosively Formed Projectiles	**Vaughan, Daniel (USA)** SHIELD Free-Field Overpressure Measurements
14:00-14:20	**Weaver, Mark** Modeling The Residual Capacity Of Blast-Damaged Reinforced Concrete Columns	**Schwer, Len** The Simulation Of Aluminum-LDPE Barriers For Protection Against Explosively Formed Projectiles	**Rickman, Denis (USA)** Comparison Of Measured NSKUSTA Pressures On Shield To Small-Scale Results
14:20-14:40	**Hajek, Radek** Heterogeneous Concrete-Based Bridge Decks Response to Near Field Explosion	**Sielicki, Piotr** Experimental Study Of Flying Debris Accelerated By Explosive	**USA** SHIELD General Discussion
14:40-15:00	Break		
Session	**Antiterrorism/Blast/Tool** **Session Chair: Stefan Greulich**	**Protec-Soil/Tool/Overburden/ Mun storage** **Session Chair: Sarah Vorgert**	**NATO- Blast, Protec, Multi Det** **Session Chair: Richard Summers**
15:00-15:20	**Swanson, Mark** The Intersection of Antiterrorism and Explosives Safety M&S, Part 1: IMESAFR for Antiterrorism	**Krauthammer, Ted** Refinement of Temporary Munition Storage Using Soil-Filled Walls	**Rios-Estremera, Daniel** Evaluation Of Scaled Range Dependency Of The TNT Equivalence For ANFO
15:20-15:40	**Kewaisy, Tarek** Advanced Modeling of High-Velocity Normal Impact of Rigid Projectiles on Reinforced Concrete Slabs	**Williams, Neil** Numerical Simulations To Evaluate Effects Of Earth Cover On An ECM	**Stephens, Catherine** Effects Of Charge Shape On Blast Loading And An Empirical Model
15:40-16:00	**Berger, Kyle** Software Tool To Predict Injuries From Debris Resulting From Structural Failure	**Durant, Bradley** Determining The Effect Of Soil Cover On The Dynamic Response Of A Concrete Roof Slab Subjected To Blast Loading Using High-Fidelity Simulation	**Gomes, Gabriel** Blast Energy-Absorption Connectors In Protection Of Infrastructures
16:00-16:20	**Oswald, Chuck** An Improved Methodology to Calculate Vented Shock Loads	**Payne, Joshua** Evaluation Of Effect Of Earth-Cover Thickness On Ecm Loading: Phase 1 Results	**Davis, Roosevelt** Multiple Charge Experiments Against A Surrogate Steel Door In A One Room Structure
16:20-16:40		**Schmitt, Daniel** RAFOB-RAM, A Risk Analysis Software Tool For Forward Operating Bases	**Bogosian, David** Predictive Metrics For Response Of A Hardened Steel Door To Multiple Charges

Paper Schedule

16:40-20:00	Load buses for Captain Anderson's Sunset Cruise- 16:40 Tour- 17:00-20:00		
Friday, October 25, 2019			
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Session	**SR-Columns/RCCol/UHPC/ Model Approach** **Session Chair: Alan Ohrt**		**NATO-Localized, Protec, Risk Mgmt, Tool** **Session Chair: Ernest Staubs**
8:00-8:20	**Krauthammer, Theodor** An Energy Flow Based Approach For Structural Response Assessment		**Bogosian, David** Experimentally-Derived Equivalent Explosive Weights For Non-Ideal Charges
8:20-8:40	**Dua, Alok** Influence Of Axial Load Ratio On The Response Of RC Columns Subjected To Contact Explosion Effects		**Huntley, Shelley** Blast Testing Of Modified Shipping Containers Intended For Use As Screening Facilities
8:40-9:00	**Stone, Michael** Normal Strength Concrete And Ultra-High-Performance Concrete Beams Under Impact		**Zohrabyan, Vahan** The Residual Load Bearing Capacity Of Reinforced Concrete As Well As Steel Fiber Reinforced Concrete Components After Contact Detonation
9:00-9:20	**Krauthammer, Theodor** Considerations Of Longitudinal And Shear Reinforcements For UHPFRC Beams		**Sibeaud, Jean-Marc** Model Scale Experiments Of Concrete Slabs Penetration At Supersonic Impact Velocity And Code Validation
9:20-9:40	**Zohrabyan, Vahan** Investigations On The Use Of Fibre Concrete For Infrastructure Protection		
9:40-10:00	Coffee Break		
10:00-11:20	Closing Session		

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