



ENGINEERING SCIENCES

Wednesday

Poster Session

- 11:30 a.m. - 1:00 p.m. **D1** **The Application of Optical Coherence Tomography (OCT) in the Detection of Latent Fingerprints**
*Ning Zhang**; *Chenming Wang*; *Zhigang Li, MD*; *Zhihui Li, PhD*; *Wei Huang*

Thursday—Session I

Guns, Grenades, and Knives

Moderator: David Pienkowski, PhD
University of Kentucky
Albert B. Chandler Hospital
Lexington, KY

- 8:30 a.m. - 8:50 a.m. **D2** **Would Blunt Blades Cut Knife Crime?**
*Sarah V. Hainsworth, PhD**; *Patrick H. Geoghegan, PhD*; *Guy N. Ritty, MD*
- 8:50 a.m. - 9:10 a.m. **D3** **Understanding the Difference Between Expired and Impact Bloodstain Patterns**
*Patrick H. Geoghegan, PhD**; *Erik Van Zuijlen, BSc*; *Loek J. Van Steijn, BSc*;
Michael Taylor, PhD; *Mark C. Jermy, PhD*
- 9:10 a.m. - 9:30 a.m. **D4** **Buffy the Vampire Slayer: But How Much Force Did She Need?**
*Sarah V. Hainsworth, PhD**; *Patrick H. Geoghegan, PhD*
- 9:30 a.m. - 9:50 a.m. **D5** **Assessing the Construction and Performance Potential of Improvised Hand Grenades**
*John Nixon, CEng, MBA**
- 9:50 a.m. - 10:10 a.m. **D6** **Handgun and Ammunition Performance Influencers**
*John Nixon, CEng, MBA**
- 10:10 a.m. - 10:40 a.m. **Break**

Instrumentation and Analysis

Moderator: Darren Franck, MSME
Advanced Engineering Associates, Inc
Charleston, WV

- 10:40 a.m. - 11:10 a.m. **D7** **Environmental Forensic Microscopy of Particles**
*James Millette, PhD**
- 11:10 a.m. - 11:30 a.m. **D8** **An Overview of Computational Linguistic Techniques for Forensic Purposes**
*Carole E. Chaski, PhD**



11:30 a.m.	-	11:50 a.m.	D9	An Investigation of Large-Scale Safety Accidents Using a 3D Scanner and a 3D Modeling Method <i>Kwangsoo Choi, MA*</i>
11:50 a.m.	-	12:10 p.m.	D10	WITHDRAWN
12:10 p.m.	-	12:25 p.m.	D11	<i>In Vivo</i> Tribometry: An Analysis of Muscle Activity Using Electromyography (EMG) During a Passive Leg Drop <i>Marcus P. Besser, PhD*</i>
12:25 p.m.	-	1:30 p.m.		Lunch

Poster Session

11:30 a.m.	-	1:00 p.m.	D12	WITHDRAWN
11:30 a.m.	-	1:00 p.m.	D13	Improvement of the Human Body Damage Evaluation Method by Computer Simulation: Verification of Infant Bone Properties Compared With Actual Experiments <i>Tomotaka Matsubara*</i> ; <i>Yasumi Ito, PhD</i> ; <i>Tatsuya Fukuoka</i> ; <i>Ryuichi Yamada</i> ; <i>Yoshiyuki Kagiyama, PhD</i> ; <i>Tetsuya Nemoto, PhD</i>
11:30 a.m.	-	1:00 p.m.	D14	The Influence That Personal Attributes of Elderly Drivers Contribute to Driving Ability and Its Secular Change: An Analysis of Physical and Mental Functions, Living Conditions, and the Effects of Diseases and Medication <i>Yasumi Ito, PhD</i> ; <i>Tomoya Sakuragawa*</i> ; <i>Kei Sato</i> ; <i>Shota Sakaida</i> ; <i>Yoshitomo Orino</i> ; <i>Ryuichi Yamada</i> ; <i>Ryota Okuwaki</i> ; <i>Tsukasa Kouno</i> ; <i>Natsumi Suzuki</i> ; <i>Yoshiyuki Kagiyama, PhD</i>

Head and Neck Injuries

Moderator: Sarah V. Hainsworth, PhD
Aston University
School of Engineering and Applied Science
Birmingham, UNITED KINGDOM

1:30 p.m.	-	2:10 p.m.	D15	A Computational Analysis of Traumatic Head Injuries Resulting From Falls and Impacts in Sports <i>Michael D. Gilchrist, PhD, DEng*</i> ; <i>Michael Thomas Connor, BAI</i> ; <i>Michio Clark, MSc</i> ; <i>Adrian McGoldrick, MB, BCH, BAO</i>
2:10 p.m.	-	2:40 p.m.	D16	A Predictive Finite Element Human Head Model to Assist Forensic Scientists <i>Jean-Sébastien Raul*</i> ; <i>Caroline Deck, PhD</i> ; <i>Franck Meyer, PhD</i> ; <i>Nicolas Bourdet, PhD</i> ; <i>Blandine Schnedecker, MD</i> ; <i>Remy Willinger</i>
2:40 p.m.	-	3:10 p.m.	D17	WITHDRAWN
3:10 p.m.	-	3:25 p.m.		Break



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- 3:25 p.m. - 3:45 p.m. **D18** **Mechanisms of Motorcycle Helmet Accident Retention Failures and Experimental Comparisons With a Safer Alternative Retention System Design Used in an Adult Football Helmet**
Kenneth J. Saczalski, PhD; Mark C. Pozzi, MS; Todd Saczalski, BSMET*
- 3:45 p.m. - 4:00 p.m. **D19** **The Conspicuity of a Horizontal Rope Hazard in the Path of a Bicyclist: A Case Study**
*James B. Hyzer, PhD**
- 4:00 p.m. - 4:10 p.m. **Break**

Ethics and Litigation

Moderator: Kurt D. Weiss, MS
Automotive Safety Research
Santa Barbara, CA

- 4:10 p.m. - 4:30 p.m. **D20** **Ethics in Forensic Engineering: Examples of Malpractice**
Darren Franck, MSME; Harold Franck, MSEE**
- 4:30 p.m. - 4:50 p.m. **D21** **The Role of the Technical Experts in Civil Law Countries: The Italian Case**
Alessandro M. Ferrero, MSc; Veronica Scotti, LLM*
- 4:50 p.m. - 5:10 p.m. **D22** **What to Do When a Client's "Pet Theory" Conflicts With Good Forensic Science Practice**
David R. Bosch, PhD; Mark C. Pozzi, MS**
- 5:10 p.m. - 5:30 p.m. **D23** **The Potential Conflict Between Forensic Science and Certain Legal Approaches in Litigation**
Kenneth J. Saczalski, PhD; Mark C. Pozzi, MS; Todd Saczalski, BSMET*

Thursday—Session II

Multidisciplinary Session: Criminalistics II/Engineering Sciences II—Fire Science and Investigation, Part I

Moderator: Sarah V. Hainsworth, PhD
Aston University
School of Engineering and Applied Science
Birmingham, UNITED KINGDOM

Co-Moderator: Sandra B. Sachs, PhD
Oakland Police Department
Crime Laboratory
Oakland, CA

- 8:30 a.m. - 8:45 a.m. **D24** **The Vision and Progress of the Organization of Scientific Area Committees (OSAC) Fire Debris and Explosives (FD&E) Analysis Subcommittee**
*Susan Seebode Hetzel, BA**
- 8:45 a.m. - 9:00 a.m. **B87** **The Bomb Maker Project: How Human Factors Affect the Characteristics and Interpretation of Explosives Evidence**
*John V. Goodpaster, PhD**
- 9:00 a.m. - 9:15 a.m. **B88** **Exploring a New Approach to Canine Training Aids for Explosives**
William A. MacCrehan, PhD; Craig Angle, PhD; Michele Schantz, PhD;*
Paul Waggoner, PhD; Jason Barrow, PhD; Kelly Van Arsdale, MS

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- 9:15 a.m. - 9:30 a.m. **B89** **A Quantitative Comparison and Differentiation of Smokeless Powders**
*Casey M. Brown, MPS; Ryan Schonert, MPS; Wayne Moorehead, MS; Jack Hietpas, PhD**
- 9:30 a.m. - 9:45 a.m. **D25** **The Use of Toxicological Evidence in Fire Investigation**
*Douglas J. Carpenter, MS**
- 9:45 a.m. - 10:00 a.m. **D26** **Exceeding the Scope of Law Enforcement in Forensic Fire Investigation**
*S.B. Addison Larson, MS**
- 10:00 a.m. - 10:30 a.m. **Break**

Multidisciplinary Session: Criminalistics II/Engineering Sciences II—Fire Science and Investigation, Part II

*Moderator: Sarah V. Hainsworth, PhD
Aston University
School of Engineering and Applied Science
Birmingham, UNITED KINGDOM*

*Co-Moderator: John L. Allen, PE
Bureau of Alcohol, Tobacco, Firearms
and Explosives
Ammendale, MD*

- 10:30 a.m. - 10:45 a.m. **D27** **Heavy Truck Fuel-Fed Fires: Predictable Fuel Leakage, Ignition Sources, Fuel Tank Placement Hazards, and Safer Alternative Designs**
Mark C. Pozzi, MS; David R. Bosch, PhD*; Kenneth J. Saczalski, PhD*
- 10:45 a.m. - 11:00 a.m. **D28** **Electrical Homicide or Not?**
*Helmut G. Brosz, BAsC, PEng**
- 11:00 a.m. - 11:15 a.m. **D29** **Sabotaged Electrical Grid: Worse Than 9/11?**
*Helmut G. Brosz, BAsC, PEng**
- 11:15 a.m. - 11:30 a.m. **B90** **Yes, Everybody Knows a Fire Needs Oxygen, But Why Should We Care?**
*John J. Lentini, BA**
- 11:30 a.m. - 11:45 a.m. **D30** **American Association for the Advancement of Science (AAAS) Forensic Science Assessments: A Quality and Gap Analysis of Fire Investigation**
*Jose R. Almirall, PhD**

Friday

A Miscellany

*Moderator: James Millette, PhD
Millette Technical Consultants
Lilburn, GA*

*Co-Moderator: Sarah V. Hainsworth, PhD
Aston University
School of Engineering and Applied Science
Birmingham, UNITED KINGDOM*

- 8:30 a.m. - 8:50 a.m. **D31** **A Case Report on a Cable Car Stoppage Accident Caused by Wild Mice**
Youngsu Kong; Jaehak Lee, PhD; Gie-tae Lee, MS; Jae-mo Goh, PhD; Nam-Kyu Park, PhD*
- 8:50 a.m. - 9:10 a.m. **D32** **Data Center Failures, Losses, and Litigation**
Helmut G. Brosz, BAsC, PEng; Ralph A. Ruffolo, BSc**



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- 9:10 a.m. - 9:30 a.m. **D33** **Propane Explosions: The Result of Failed Water Heater Gas Control Valves—
Manufacturing Flaws Brought on by Design Changes by an Outsourcer**
*Tim G. Dunn, MS**
- 9:30 a.m. - 9:50 a.m. **D34** **An Explosion of a Primitive Industrial Oven in India: A Forensic Analysis**
Jatin Bodwal, MD; Anil Aggrawal, MD*
- 9:50 a.m. - 10:10 a.m. **D35** **A Framework for the Cost Evaluation of Deforestation Based on the Habitat
Equivalency Analysis (HEA) Principle**
David Domingues Pavanelli, PhD; Nickolaos Voulvoulis, PhD*
- 10:10 a.m. - 10:30 a.m. **Break**

Automotive

- 10:30 a.m. - 10:50 a.m. **D36** **A Fatal Injury Caused by a Scissor Jack in a Rear-End Collision**
*Kurt D. Weiss, MS**
- 10:50 a.m. - 11:10 a.m. **D37** **Positional Asphyxia**
*David Pienkowski, PhD**
- 11:10 a.m. - 11:30 a.m. **D38** **Seat Belt Load Marks on Aged Restraint Systems**
*Mike Markushewski, BS**
- 11:30 a.m. - 11:50 a.m. **D39** **Shared Anchor Seat Belt Buckle Self-Release**
*Kurt D. Weiss, MS**
- 11:50 a.m. - 12:10 p.m. **D40** **Seat Belt Analysis: Sometimes Plastic Transfer to a Webbing Indicates the Restraint
Was NOT in Use During a Crash**
*David J. Porta, PhD**

Poster Session

- 11:30 a.m. - 1:00 p.m. **D41** **Void Analysis in the Inside of Arc Melting Using 3D X-Rays**
Young Jin Cho; Dong Gyu Lee, MA; Sun Jae Kim, MA; Jong Teak Park, MA;
Jae-mo Goh, PhD; Nam-Kyu Park, PhD*
- 11:30 a.m. - 1:00 p.m. **D42** **The Distinction Between Arc Melting and Fire Melting Using X-Rays**
Jae-mo Goh, PhD; Young Jin Cho; Dong Gyu Lee, MA; Sun Jae Kim, MA;
Jong Teak Park, MA; Nam-Kyu Park, PhD*