National Institute of Justice

Forensic Science Research and Development Symposium

American Academy of Forensic Sciences 76th Annual Scientific Conference

The National Institute of Justice (NIJ) Forensic Science Research and Development (R&D) Symposium is an open meeting delivered through NIJ's Forensic Technology Center of Excellence (FTCOE) where attendees can learn about NIJ-funded research across a variety of forensic science areas. You can register to attend the Symposium in person or virtually; however, American Academy of Forensic Sciences (AAFS) conference registration is not necessary to attend. Feel free to stop by to listen to specific presentations and view posters or stay all day and learn about the diverse NIJ forensic science R&D portfolio.

More details and registration information can be found here: https://forensiccoe.org/event-2024-research-development-symposium/

Agenda – Tuesday, February 20, 2024

The podium presentations will take place from 8:30am MST to 5:00pm MST in Meeting Rooms 205/207 at the Colorado Convention Center. A Q&A session for each presenter will directly follow their presentation. Please note that all times are listed in Mountain Standard Time (MST, UTC-7).

Start Time (MST)	End Time (MST)	Session Title
8:30am	8:40am	Welcome and Opening Remarks *Lucas Zarwell, Office of Investigative and Forensic Sciences, National Institute of Justice*
Session I – Physics and Pattern Interpretation/Trace Evidence *Moderated by NIJ Program Manager, Gregory Dutton*		
8:40am	9:05am	Development of Nationwide Reference Population Distributions for Statistically Supported and Objective Testimony in Firearm Evidence Comparisons *Xiaoyu Alan Zheng, National Institute of Standards and Technology*
9:05am	9:30am	Assessing the Strength of Trace Evidence Fracture Fits Through a Comprehensive, Systematic, and Quantifiable Approach *Tatiana Trejos, West Virginia University*
9:30am	9:55am	Universal Method for the Detection of Organic and Inorganic Gunshot Residue Based on Fast Fluorescence Mapping and Raman Spectroscopic Identification *Igor K. Lednev, University at Albany, State University of New York*
9:55am	10:20am	Comprehensive Assessment of Novel Reference Materials and Analytical Methods for the Analysis and Interpretation of Organic and Inorganic Gunshot Residues *Luis Arroyo, West Virginia University*
10:20am	10:35am	Break

Start Time (MST)	End Time (MST)	Session Title
Session II – Forensic Anthropology and Forensic Pathology *Moderated by NIJ Program Manager, Danielle McLeod-Henning*		
10:35am	11:00am	Pre-grouping of Commingled Human Skeletal Remains by Elemental Analysis *Matthieu Baudelet, University of Central Florida*
11:00am	11:25am	Potential Postmortem Microbial Biomarkers of Infant Death Investigation *Jennifer Pechal, Michigan State University*
11:25am	11:50am	Forensic Tool to Identify Fall Characteristics in Infant Skull Fracture *Brittany Coats, University of Utah*
11:50am	12:15pm	Determining Fracture Timing from Microscopic Characteristics of Cortical Bone *Jessica Skinner and Natalie Langley, Mayo Clinic Arizona*
12:15pm	1:25pm	Lunch Break – On Your Own
Session III – Seized Drugs and Toxicology *Moderated by NIJ Program Manager, Frances Scott*		
1:25pm	1:50pm	Non-contact Detection of Fentanyl and Other Synthetic Opioids: Toward a Generalized Approach to the Detection of Dangerous Drug Classes *Lauryn E. DeGreeff, Florida International University*
1:50pm	2:15pm	Expert Algorithm for Substance Identification Applied to the Tandem Mass Spectra of Seized Drugs *Glen Jackson, West Virginia University*
2:15pm	2:40pm	Retinal Cannabinoids: Measures of Function and Impairment *Denise Valenti, Impairment Measurement Marijuana and Driving (IMMAD)*
2:40pm	3:05pm	Prevalence of Fentanyl and Its Analogues in a Court-Ordered Mandatory Drug Testing Population *Katherine Bollinger, RTI International*
3:05pm	3:20pm	Break
Session IV – Forensic Biology/DNA *Moderated by NIJ Program Manager, Tracey Johnson*		
3:20pm	3:45pm	Improved Nucleic Acid Recovery from Trace and Degraded Samples Using Affinity Purification *Arati Iyengar, West Virginia University*
3:45pm	4:10pm	Forensic STR Sequencing Nomenclature Resource *Katherine B. Gettings, National Institute of Standards and Technology*
4:10pm	4:35pm	Comparative Evaluation of Massively Parallel Sequencing STR Kits with the Emphasis on Mixture Deconvolution Utilizing Probabilistic Genotyping *Elisa Wurmbach, New York City Office of the Chief Medical Examiner*
4:35pm	5:00pm	Comparative Assessment of Emerging Technologies for Body Fluid Identification *Mirna S. Ghemrawi, Center for Forensic Science Research and Education*
Adjourn		

Poster Session

The poster presentations will be from 5:00pm MST to 6:30pm MST in Meeting Rooms 201/203 at the Colorado Convention Center. Self-guided tours will begin at 12:00pm MST, and the poster room doors will remain open until 7:00pm MST. For those who wish to access the posters virtually, more information can be found here: https://forensiccoe.org/event-2024-research-development-symposium/

Poster Presentations

Physics and Mathematical Models for Error Quantifications in Comparative 3D Microscopy for Physical Match Analysis
Ashraf Bastawros, Iowa State University

Physics and Statistical Models for Physical Match Analysis Utilizing 3D Microscopy of Fracture Surfaces
Ashraf Bastawros, Iowa State University

Evaluation of Mobile Technology for Detection of Inorganic and Organic Gunshot Residues in Firearms-Related Investigations
Kourtney Dalzell, West Virginia University

Assessing the Reliability of Modern µXRF Technology for Expanded Impact on the Forensic Examination and Interpretation of Trace Materials: Glass Evidence
Troy Ernst, Michigan State Police

Elucidation of the Effect of Heat and Sun Exposures on Hair Colored by Permanent and Semi-Permanent Colorants Using Surface-Enhanced Raman Spectroscopy (SERS)
Dmitry Kurouski, Texas A&M University

Assessing the Reliability of Modern µXRF Technology for Expanded Impact on the Forensic Examination and Interpretation of Trace Materials: Tape Evidence
Lacey Leatherland, West Virginia University

Enhancing Fire Pattern Analysis with Experiments on Architectural Finishes Impact and Developing Data-Driven Tools
Shuna Ni and Pengkun Liu, University of Maryland, College Park

Analysis of Small Particles Adhering to the Edges of Duct Tape as a Means to Make Associations in a Way That Is Independent of Manufactured Characteristics
David A. Stoney, Stoney Forensic, Inc.

Accounting for Covariates in Forensic Error Rate Assessment and Evidence Interpretation
Larry Tang, University of Central Florida

Utilizing eDNA from Four Biological Taxa Associated with Geologic Evidence for Sample-to-Sample Comparisons and Study Site Separation
Teresa M. Tiedge, North Carolina State University

Assessing Methods to Enhance and Preserve Proteinaceous Impressions from the Skin of Decedents During the Early Stages of Decomposition While Examining Environmental Variations Across Seasons
Jessica Zarate, Madonna University

Recovery and Analysis of Both Volatile and Less-Volatile Compounds from Ignitable Liquid Residues on Substrates/Debris by SPME-DART-MS
Mengliang Zhang, Middle Tennessee State University

GIS Application for Building a Nationally Representative Forensic Taphonomy Database
Madeline M. Atwell, Clemson University

Skeletal Blast Trauma: Determining the Effect of Known and Experimental Blast Events on Trauma Patterns, Fracture Behavior, and Blast Scene Recovery Approaches
Petra Banks, Texas State University

Improving Identification of Unknown American Indians and Hispanic/Latinx Americans
Kelly Kamnikar, University of New Mexico

Expanding and Validating the Microbiome Database for Estimating the Postmortem Interval
Jessica Metcalf, Colorado State University

Finding the Missing and Unidentified: The Application of Predictive Modeling, Ground-Penetrating Radar, and Small Unmanned Aircraft-Mounted Infrared Imagery for the Detection of Unmarked Graves
Mariah E. Moe, Texas State University

Towards an "Eggs-perimental" Approach for Species Determination of Blow Fly Eggs to Facilitate Estimations of Postmortem Interval
Rabi A. Musah, University at Albany, State University of New York

An Examination of Musculoskeletal Markers in Modern Populations for Forensic Analysis and Identification Purposes
Emilie L. Wiedenmeyer, Texas State University

Development of a Colorimetric Breath Analyzer for THC
Emanuele Alves, Virginia Commonwealth University

Illuminating the Dark: Molecular Networking as a Novel Psychoactive Substance Identification Strategy
Maia Bates, University Of Wisconsin System

Advanced Microfluidic Technology for Automated, Rapid, and Objective Laboratory Screening of Seized Drugs
Shannon T. Krauss, RTI International

Confirming the Presence of Novel Psychoactive Substances in Forensic Samples from Medicolegal Death Investigations
Alex J. Krotulski, Center for Forensic Science Research and Education

Developing an Approach to Standardize the Naming of Novel Psychoactive Substances (NPS)
Alex J. Krotulski, Center for Forensic Science Research and Education

Breath Measurements of Acute Cannabis Use (BACE): Towards Reliable Determination of Recent Use
Tara M. Lovestead, National Institute of Standards and Technology

Application of Insights from High-Level Density Functional Theory for the Differentiation of Marijuana and Hemp
Rabi A. Musah, University at Albany, State University of New York

Accurate THC Determinations in Seized Cannabis-Derived Finished Products for Forensic Laboratories
Walter Brent Wilson, National Institute of Standards and Technology

Moving Forward with Direct PCR: Touch DNA Samples and CODIS Eligibility
Abigail Bathrick, Bode Technology

Quantifying the Accuracy of Two Innovative Forensic Genetic Identification Techniques
Maria Flores, San Francisco State University

py_ped_sim—A Flexible Forward Genetic Simulator for Complex Family Pedigree Analysis
Miguel Guardado, San Francisco State University

DNA Typing Strategies for Identification of Human Remains via Real-Time Nanopore Sequencing
Katherine McBroom, University of North Texas Health Science Center at Fort Worth

Optimizing the Analysis of DNA From Burned Bone Using Ancient DNA Techniques
Cody Parker, Arizona State University

Species Identification in Forensic Casework Using Proteomics
Glendon Parker, University of California, Davis

Testing New Methods for Degraded DNA Recovery and Next-Generation Sequencing
Erin Rawls, Arizona State University