

# National Institute of Justice

## Forensic Science Research and Development Symposium

### American Academy of Forensic Sciences 77th 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-2025-research-development-symposium/>

#### Agenda—Tuesday, February 18, 2025

The podium presentations will take place from 8:30 a.m. EST to 5:00 p.m. EST in Meeting Rooms 309/310 at the Baltimore Convention Center. A Q&A session for each presenter will directly follow their presentation. Please note that all times are listed in Eastern Standard Time (EST).

Start Time (EST)	End Time (EST)	Session Title
8:30 a.m.	8:40 a.m.	Welcome and Opening Remarks <i>Lucas Zarwell, Office of Investigative and Forensic Sciences, National Institute of Justice</i>
<b>Session I—Trace Evidence/Fire Investigation/Physics and Pattern</b> <i>Moderated by NIJ Program Manager Gregory Dutton</i>		
8:40 a.m.	9:05 a.m.	Assessment of the Added Value of New Quantitative Methodologies for the Analysis of Surface Soils in Forensic Soil Comparisons <i>Kelly A. Meiklejohn, North Carolina State University</i>
9:05 a.m.	9:30 a.m.	The Influence of Soils and Chlorinated and Non-Chlorinated Agitated Water on Surface-Enhanced Raman Spectroscopic Analysis of Artificial Dyes on Hair <i>Dmitry Kurouski, Texas A&amp;M University</i>
9:30 a.m.	9:55 a.m.	Experimental Study of Heat Transfer and Fire Damage Patterns on Walls for Fire Model Validation <i>Matthew J. DiDomizio, Fire Safety Research Institute</i>
9:55 a.m.	10:20 a.m.	Evaluation of the Occurrence and Associative Value of Non-Identifiable Fingermarks on Unfired Ammunition in Handguns for Evidence Supporting Proof of Criminal Possession, Use, and Intent <i>David A. Stoney, Stoney Forensic, Inc.</i>
10:20 a.m.	10:35 a.m.	BREAK

Start Time (EST)	End Time (EST)	Session Title
<b>Session II—Forensic Anthropology and Forensic Pathology</b>		
<i>Moderated by NIJ Program Manager Rachel Wendt</i>		
10:35 a.m.	11:00 a.m.	Optimizing Bruise Detection in Forensic Imaging: A Comparative Analysis of Object Detection Models <i>Mehrdad Ghyabi, George Mason University</i>
11:00 a.m.	11:25 a.m.	Using Artificial Intelligence: Deep Learning for Human Decomposition Staging <i>Audris Mockus, University of Tennessee, Knoxville</i>
11:25 a.m.	11:50 a.m.	Deep Learning Empowers Fine-Grained Population Affinity Estimation with Craniometric Data <i>Jinyong Pang, University of South Florida</i>
11:50 a.m.	12:15 p.m.	Is Decedent Residual Odor Detectable by Human Remains Detection (HRD) Canines and Analytical Chemistry? <i>Dawnie Steadman and Mary Cablk, University of Tennessee, Knoxville</i>
12:15 p.m.	1:25 p.m.	LUNCH BREAK – On Your Own
<b>Session III—Seized Drugs and Toxicology</b>		
<i>Moderated by NIJ Program Manager Megan Chambers</i>		
1:25 p.m.	1:50 p.m.	Identifying High-Quality Aptamers for Drug Detection <i>Alexandra Bryant, North Carolina State University</i>
1:50 p.m.	2:15 p.m.	Caught Green-Handed: The Detection of Potential Cannabis-Use Biomarkers in Fingerprint Residues Using Mass Spectrometry <i>Rabi Ann Musah, Louisiana State University</i>
2:15 p.m.	2:40 p.m.	Chromatographic Interferences That Can Inflate the Levels of $\Delta 9$ -THC in Cannabis Samples <i>Walter B. Wilson, National Institute of Standards and Technology</i>
2:40 p.m.	3:05 p.m.	Evaluation of a Quantitative Analysis Method for Tetrahydrocannabinol Isomers in Biological Matrices <i>Rebecca Wagner, Virginia Department of Forensic Science</i>
3:05 p.m.	3:20 p.m.	BREAK
<b>Session IV—Forensic Biology/DNA</b>		
<i>Moderated by NIJ Program Manager Tiffany Layne</i>		
3:20 p.m.	3:45 p.m.	Trace DNA in Activity-Level Propositions <i>Ashley Hall, University of California, Davis and Ray Wickenheiser, Ray Wickenheiser Forensic Consulting</i>
3:45 p.m.	4:10 p.m.	A Comparison of Small-Amplicon Mitogenome Enrichment Methods for Massively Parallel Sequencing of Low- and High-Quality Sample Types <i>Courtney Cavagnino, Armed Forces DNA Identification Laboratory</i>
4:10 p.m.	4:35 p.m.	Fragmentomics of Hair DNA <i>Samuel Sacco, University of California, Santa Cruz</i>
4:35 p.m.	5:00 p.m.	Adaptive Sampling for the Simultaneous Analysis of STRs, SNPs, and mtDNA in Human Remains Identification <i>Katherine E. McBroom Henson, University of North Texas Health Science Center</i>

**Adjourn**

## Poster Session

The poster presentations will be from 5:00 p.m. EST to 6:30 p.m. EST in Meeting Rooms 307/308 at the Baltimore Convention Center. Self-guided tours will begin at 12:00 p.m. EST, and the meeting room doors will remain open until 7:00 p.m. EST.

Posters indicated with an asterisk (\*) will be available virtually only. More details and information can be found here: <https://forensiccoe.org/event-2025-research-development-symposium/>

### Poster Presentations

Quantitative Matching of Forensic Evidence Fragments of Metals, Ceramics and Plastics Using Fracture Surface Topography and Statistical Learning  
*Ashraf Bastawros, Iowa State University*

Application of Particle-Correlated Raman Spectroscopy (PCRS) for the Forensic Examination of Soils  
*Brooke W. Kammrath, University of New Haven and Henry C. Lee Institute of Forensic Science*

Using Ultrasonic Pulse Velocity to Assess Fire Damage in Drywall  
*Maria Binte Mannan, University of Maryland*

Advancing the Understanding of 3D Imaging for Firearms Identification\*  
*Melissa Nally, Houston Forensic Science Center*

Assessing the Reliability of Fire Pattern Indicators in Wildland Fire Investigations: A Field Study\*  
*Raphael Ogabi, Worcester Polytechnic Institute*

Analysis of Oil-Based Ignitable Liquid Residues on Wood and Fabric Debris by GC-MS and DART-MS  
*Mengliang Zhang, Ohio University*

Interoperability of Firearm Toolmark 3D Topography Measurements  
*Xiaoyu Alan Zheng, National Institute of Standards and Technology*

Improving and Evaluating Computed Tomography and Magnetic Resonance Imaging in the Investigation of Fatalities Involving Suspected Head Trauma  
*Natalie Adolphi, New Mexico Office of the Medical Investigator*

Skeletal Trauma in Forensic Anthropology: Improving the Accuracy of Trauma Analysis and Expert Testimony  
*Amanda Agnew, The Ohio State University*

Pre-Grouping of Commingled Human Skeletal Remains by Elemental Analysis  
*Matthieu Baudalet and Kristen Livingston, University of Central Florida*

Initial Assessments of Relic DNA Removal from Host- and Environmentally Sourced Microbiome Evidence  
*Zachary Burcham and Emily Cantrell, University of Tennessee, Knoxville*

Eggs-ploring the Volatiles Profiles of *L. sericata* Eggs for Postmortem Interval Determination  
*Alexa Figueroa, Louisiana State University*

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

Exploring the Potential of Amino Acid  $\delta^2\text{H}$  Analysis as a Forensic Tool to Identify Region of Origin  
*Christy J. Mancuso, The University of New Mexico*

GIS Application for Building a Nationally Representative Forensic Taphonomy Database  
*Katherine Weisensee, Clemson University*

What a Trip! Investigating the Stability of Psilocybin and Psilocin Infused within Complex Edible Matrices  
*Benedetta Garosi, Louisiana State University*

Detecting Fentanyl Analogs in Counterfeit Pharmaceuticals by Surface-Enhanced Raman Spectrometry  
*Bruce McCord, Florida International University*

Chiral Separation and Quantification of Methamphetamine in Whole Blood  
*William Naviaux, University of Wisconsin–Madison*

Multimodal Raman Spectroscopy and Mass Spectrometry Analysis of Synthetic Drugs in Blood Plasma Utilizing Nanoparticle-Decorated Porous Substrates  
*Rajesh Sardar, Indiana University Indianapolis*

Potency Testing of Synthetic THC Isomer-Infused Edibles Using Ultra-High-Performance Liquid Chromatography Diode Array Detector with Optional Electrospray Ionization Time-of-Flight Mass Spectrometry  
*Liguo Song, Western Illinois University*

Enhancing Field Detection of Fentanyl: A Novel Pre-Concentrator for Ion Mobility Spectrometry Using Silicon Nanowires\*  
*Galpayage Dona Thouli Lochana Jayawardana, Florida International University*

Navigating the Unknown: A Comparative Analysis of Targeted and Non-Targeted Approaches for Detecting New Psychoactive Substances in Human Matrices  
*Akshita Verma, Florida International University*

Rapid Response to Novel Psychoactive Substances (NPS) Identified in U.S. Recreational Drug Markets  
*Sara Walton and Alex Krotulski, The Center for Forensic Science Research & Education*

Transfer, Persistence and DNA Source Attribution of Trace Biological Material in Digital Penetration Assault Cases  
*Erin Hanson, University of Central Florida*

Recovery of Multiple Analytes from Biological Samples for Forensic Application  
*Arati Iyengar, West Virginia University*

Applications of the Genital Microbiome in Detecting Sexual Contact  
*Andrea Ramirez Torres, Florida International University*

Assessment of Promega's PowerSeq 46GY Through Testing of the Standard and the Micro Flow Cells  
*Elisa Wurmbach, New York City Office of Chief Medical Examiner*