

Trace Evidence Symposium Poster Session

3:00pm - 5:00pm

Island Ballroom

An overwhelming response, both from the United States and abroad, was received as a result of the Trace Evidence Symposium's "Call for Papers" issued earlier this year. The poster session provides an opportunity for trace evidence researchers and practitioners to present their work in a public forum. Abstracts can be found in the "Poster Session" section of the program book, and full papers can be found on the CD-ROM containing Symposium materials.

Determination of Elemental Sulfur in Explosives and Explosive Residues by Gas Chromatography-Mass Spectrometry. This poster will present the use of GC-MS for the detection and positive identification of elemental sulfur from explosives and explosive residues. The method is efficient, conclusive, and 400 times more sensitive than the chemical color test for sulfur.

Kimberly S. Bradley, Forensic Scientist, Trace Chemistry, Springfield Forensic Science Laboratory, Illinois State Police, Springfield, IL

The Forensic Examination of Plastic Cable Ties. This poster will present the results of a study on the forensic examination of plastic cable ties. The study involved the visual and microscopic examination of more than 2000 cable ties of known origin, which were obtained from various retail outlets, electrician and plumber workshops, and included both sealed and opened packages. These reference samples encompassed 18 different types of ties.

In addition, 92 randomly collected samples obtained mainly from building sites, were examined. Another 30 different types of plastic cable ties could be differentiated among these samples.

Katarina Burda, Senior Analyst, Division of Analytical Laboratories, Physical Evidence Laboratory, Lidcombe, New South Wales, Australia

The Analysis of Colored Acrylic, Cotton, and Wool Fibers Using Raman Spectroscopy. Raman spectroscopy was applied for the detection of textile fiber dyes. Blue, black and red acrylic, cotton and wool fibers were analyzed. The potential of this technique was investigated in terms of identification, discrimination and integration in the classical analytical sequence for fiber analysis.

Patrick Buzzini, Senior Lecturer, Forensic and Investigative Sciences, West Virginia University, Morgantown, WV

Inside vs. Outside: Fact or Fiction? When examining hats for trace evidence at the FBI Laboratory, hairs and fibers are collected primarily using a scraping technique, separating debris collected from the inside and outside. This poster, *Inside vs. Outside: Fact or Fiction?*, presents research that was conducted to see how trace evidence shifts within the packaging during transit from the scene of a crime to the laboratory.

Deborah D. Chewing, Physical Scientist, Trace Evidence Unit, FBI Laboratory, Quantico, VA

The Use of the PDQ (Paint Data Query) Database Along with Other Resources to Provide Vehicle Information for Hit and Run Fatalities within Virginia. This poster will review four cases where the Virginia Department of Forensic Science was requested to determine source vehicle information from recovered automotive paint. The results obtained from the four cases ranged from very general information to determining the specific make, model, year and color of the vehicle of origin.

Brenda B. Christy, Forensic Scientist Senior, Trace Evidence Section, Eastern Laboratory, Virginia Department of Forensic Science, Norfolk, VA

The Synergistic Nature of Trace Evidence and Tool Mark Examinations. This poster will present a discussion outlining the advantages of analyzing trace evidence in conjunction with tool marks. In order to illustrate the points that are discussed, several case studies will be presented.

Vincent J. Desiderio, Forensic Scientist I, Office of Forensic Sciences, New Jersey State Police, Hamilton, NJ

Rapid Post Blast Inorganic Explosive Analysis by Suppressed Ion Chromatography. This poster will present a method for rapid analysis of inorganic explosive residues based on suppressed ion chromatography and coated column technologies.

Phillip Doble, Senior Lecturer, Chemistry, Materials and Forensic Science, University of Technology, Sydney, Broadway, New South Wales, Australia

A Study of the Discrimination of Some Automotive Paint Films Having Identical Color Codes. This poster will present a study that was conducted into the discrimination of automotive paint films under the worst-case condition of distinguishing non-effect films of identical color codes. This study drew on one thousand automotive paint film samples that had been collected under the Paint Database Query (PDQ) program, and variously covered model years 1998 through 2005. Thirty-four (34) red samples, including Ford's code E-4 and Chrysler's code PR-4, and seventy (70) white samples, including Ford's codes WT and YZ, Hyundai's code NW, and Chrysler's code PW-7 were subjected to analysis.

The analysis of each film progressed to the point of discrimination, beginning with micro-diamond attenuated total reflectance (ATR) Fourier transform infrared (FTIR) spectroscopy, then Microspectrophotometry (MSP), and finally, scanning electron microscopy (SEM) energy dispersive spectrometry (EDS). The order of examination was selected on the basis of analytical discriminating power, ease of sampling, and sample preservation (non-destructiveness).

Michael B. Eyring, President, Micro Forensics, Ltd., Phoenix, AZ

Tiny Blue Particles Link Suspect to Elderly Homicide Victim. This poster will present an examination of particles that were analyzed by PLM, micro-FTIR and Microspectrophotometry.

Robin S. Gall, Criminalist Unit Manager, Crime Laboratory, Broward Sheriff's Office, Ft. Lauderdale, FL

The Forensic Examination and Analysis of Paper Matches. This poster presentation will have illustrations showing the 10 key physical characteristics that can be determined in a forensic match examination. Also, the poster presentation will include analytical data that was obtained by PLM, SEM-EDS, XRF, TLC, MSP, paper fiber analysis, and Adobe® Photoshop®.

Thomas J. Hopen, Forensic Chemist, Arson and Explosives Unit, Forensic Science Laboratory – Atlanta, Bureau of Alcohol, Tobacco, Firearms and Explosives, Atlanta, GA

Condom Trace Evidence, Wolfgang Keil, Andrea M. Berzlanovich. In sexual assaults it is necessary to know about the possibility of analyzing condom residues. Microscopic and chemical-analytical methods will be discussed. Also, examination results in practical cases will be demonstrated.

Wolfgang Keil, Professor, Justitut of Forensic Medicine, Ludwig-Maximilians-University, Munich, Germany

The Effects of Scavenging and Weathering on Fabric Damage. This poster will present the effects of scavenging and weathering on cut/tears from stabbings and gunshots. Clothing items were damaged under controlled circumstances in the laboratory and then placed outside on pigs in order to let the normal decomposition process, scavengers and insects alter the cuts and tears as may happen in homicide cases where the body is not recovered immediately.

Sandra Koch, Trace Evidence Examiner, FBI Laboratory, Quantico, VA

Procedural Validation of Primer Gunshot Residues by Scanning Electron Microscopy/Energy Dispersive X-Ray Analysis. This poster will show the process used to generate and validate the procedure in use by the Illinois State Police to examine for and identify the presence of primer gunshot residue. Presentation of data in picture and graphical form will illustrate how primer gunshot residue particles were defined and how discharged samples were classified. Finally, potential outcomes for samples and report wording for each outcome will be presented.

Michael A. Kopina, Group Supervisor - Micro/Trace, Forensic Science Center at Chicago, State of Illinois, Chicago, IL

Pollen Analysis: An Underutilized Discipline in the U.S. Forensic Science Community. This poster will provide forensic examiners, law enforcement personnel, and legal professionals a review of pollen analysis, its potential use in forensic casework, and the factors that have limited its application in the United States. Protocols will be outlined to conduct pollen analysis, including evidence and sample collection, processing options, issues with identification and interpretation, and potential advances. Finally, a case study will be presented from a kidnapping that included soil and pollen analysis conducted by the FBI and US Geological Survey (USGS).

David A. Korejwo, Geologist, Trace Evidence Unit, Laboratory Division, Federal Bureau of Investigation, Quantico, VA

The Microscopic Appearance of Hairs After Laser Hair Removal Treatment. This poster will demonstrate the microscopic appearance of hairs after four (4) laser hair removal treatments over a two (2) year period. Hairs were collected from one week following treatments and mounted on glass microscope slides for analysis. The laser hair treatment had a dramatic effect on the microscopic appearance of the hairs collected.

Karen Korsberg, Forensic Examiner, Trace Evidence Unit, FBI Laboratory, Quantico, VA

Suicide or Homicide? A Case Report Involving Textile Fibre Investigations. This poster details a case where a woman was found hanging dead in the garage of her house. Signs indicating a struggle could not be detected, the medical examiner stated that the case was a suicide. By means of the fibre investigations it could be determined in which way the woman had died.

Wolf Krauss, Forensic Biologist, Forensic Science Institute, Stuttgart, Germany

Pattern Recognition Methods for the Classification of Trace Evidence Textile Fibers From UV-visible and Fluorescence Spectra. Identification of patterns in analytical chemical data and interpretation of observed differences is an important task for forensic chemists. This poster will discuss software and a database developed for forensic comparison and confirmation of statistical validity of discrimination between different dyed textile fibers.

Stephen L. Morgan, Professor, Department of Chemistry and Biochemistry, University of South Carolina, Columbia, SC

New Developments in Textile Technology: What Can we Expect in the Near Future? The textile industry has developed advanced textiles and fiber types which are already available in the market or will be available in the near future. Forensic Scientists will be involved in the identification of new nano-particles and nano-composites. With new developments in this area, the field needs more refined techniques to identify these specialized textiles and fiber types and also offer possibilities to enhance textile intelligence work.

Kornelia Nehse, Head of the Fibers and Micromorphology Section, Forensic Science Institute, Berlin, Germany

A 'Zonal' Approach to Fibre Mapping. The ability to construct a fibre distribution map relating to the victim of a homicide at a crime scene can potentially provide a means of elucidating the nature of the contact by the assailant, causing the fibre transfer. Such information is potentially useful in the investigative and corroborative phases of homicide investigation. The circumstances and methods of recovery conducive to this approach will be presented, as will the wider implications and value of fibre recovery at scenes of crime in general.

Ray Palmer, Consultant Forensic Scientist, Fibres Division, The Forensic Science Service, Huntingdon, Cambridge, United Kingdom

Changes to Human Head Hairs Heated to 100-400°C. Burned hairs were obtained from the head of a suspect in an arson case. This study was done to see whether or not heat styling would cause the burn characteristics as seen in this case. In this study, donated human head hairs were exposed to different heating conditions within and beyond the temperature range that should be encountered in heat styling and the resulting observations are presented in this poster.

Elizabeth M. Pangerl, Forensic Scientist, Trace (Micro) Laboratory, Minnesota Bureau of Criminal Apprehension Forensic Science Laboratory, Saint Paul, MN

Detection and Analysis of Firearm Propellants by Fluorescence Chemical Imaging.

This poster summarizes current research being conducted into the fluorescence chemical imaging detection and analysis of firearm propellant. Aspects that are explored include discrimination between and within brands of ammunition and the ability of the technique to link fired and unfired samples.

Gemma Payne, Forensic Chemist, Australian Federal Police, Canberra, ACT, Australia

The Microscopic Analysis of World Trade Center Dust. This poster will first show the devastation at “Ground Zero”, the location and collection of dust specimens at “Ground Zero” and surrounding areas on Sept. 11, 2001 and throughout the next year. Next, the sample preparation of dust specimens will be discussed. Finally, the method developed and used to study the WTC dust specimens will be discussed at length, and the results and findings of the analysis will be elucidated with a series of photomicrographs, graphs and tables and charts.

Nicholas Petraco, Technical Supervisor and Forensic Consultant for Trace Evidence and Criminalistics, Forensic Investigation Division, New York City Police Department, New York, NY

Distinction Between the Metals of Various Firearms by Scanning Electron Microscopy-Energy Dispersive X-Ray Analysis (SEM-EDX), Micro X-Ray Fluorescence (μ -XRF) and Inductively Coupled Plasma-Mass Spectrometry (ICP-MS).

The ability to demonstrate that recovered metal fragments originated from a firearm, and more specifically from a specific make and model of firearm was investigated in this project using Scanning electron microscopy – energy dispersive x-ray (SEM-EDX) spectrometry, micro – X-ray fluorescence (μ -XRF) spectrometry and solution based inductively coupled plasma mass spectrometry (ICP-MS).

Claude Roux, Director, Centre for Forensic Science, University of Technology, Sydney, Broadway, New South Wales, Australia

Intra-sample vs. Inter-sample Variability in Architectural Paint. This project investigated whether any intersample variations between architectural paint products of the same brand could be established. Different batches of the same product were analysed to test whether they could be distinguished using a normal forensic procedure.

Claude Roux, Director, Centre for Forensic Science, University of Technology, Sydney, Broadway, New South Wales, Australia

Automotive Paint as Evidence in an Unusual “Hit” and “Run”. This poster will present a homicide case that occurred in 2003. While on routine patrol, deputies observed a group of men standing around a car in the rear yard of a house. The group scattered (the “Run”) when they saw the deputies. Upon further investigation, it was discovered that a male homicide victim covered in blood and blue-green paint (the “Hit”) was lying at the rear of the vehicle. The deputies established a containment of the area and eight subjects were arrested and taken to trial. The poster will present the paint comparison aspects of the case, which gave unexpected analytical results.

Stephen A. Schliebe, Senior Criminalist, Trace Evidence Section, Scientific Services Bureau, Los Angeles County Sheriff's Department, Los Angeles, CA

The Forensic Analysis of Wooden Stick Matches in a Southern California Arson Case and Subsequent Examinations in Two Other Arson Cases. This poster will present the analysis of wooden stick matches, including the examinations of waterproof matches, in three Southern California arson cases using various analytical techniques.

Marianne Stam, Senior Criminalist, Riverside Criminalistics Laboratory, California Department of Justice, Riverside, CA

FTIR Spectral Imaging Applications in Trace Evidence. Infrared spectral (or chemical) imaging is emerging as an exciting new tool in forensic analysis. This poster will present some of our work in the application of infrared spectral imaging to different types of trace evidence: automotive paint chips, bicomponent fibers and the detection of illicit substances in fingerprints.

Mark Tahtouh, Ph.D. Student, Centre for Forensic Science, University of Technology, Sydney, Broadway, New South Wales, Australia

Forensic Automotive Carpet Identification Database (FACID). The Forensic Automotive Carpet Identification Database (FACID) is a database currently being developed by the Laboratory Division of the FBI. FACID is a collection of automotive carpet samples from personally-owned vehicles and automobile manufacturers. This poster will demonstrate the current status of FACID and the extensive validation studies that have been conducted.

Diane K. Williams, Research Chemist, Laboratory, Federal Bureau of Investigation, Quantico, VA