

WORKSHOP DESCRIPTIONS

Implementation of Lubricant Analysis in Sexual Assault Casework Jeffrey Drake and Jamey Adams, USACIL (Monday 10/19)

Lubricants have been encountered in sexual assault crimes in many facets. Lubricants may be used to facilitate an act, be present in the background of samples, or be transferred due to the use of lubricated condoms. This workshop will provide a basis for the incorporation of lubricant analysis into current laboratory systems with a minimal investment on the part of the laboratory. Students will be provided background information on the types of samples that are typically encountered in lubricant analyses, including commercial sexual lubricants, improvised lubricants, and condoms. The course will include such topics as the recognition and collection of lubricant materials as evidence - including strategies to account for background materials, techniques for the extraction of lubricant materials, and analytical schema. Students will also be introduced to methods of data interpretation, analytical conclusions and the limitations of these exams. The workshop will conclude with a roundtable discussion of future needs in this area of analysis and potential areas for research and development. It is recommended that students have a background in FT-IR and GC/MS analyses and data interpretation.

Forensic Building Materials Bill Schneck, Microvision Northwest-Forensic Consulting, Inc. (Sunday 10/18 and Monday 10/19)

The class will consist of a systematic analysis of building materials commonly encountered in microanalysis casework. The class will cover the composition of cement/concrete, gypsum products, fibrous and non-fibrous insulation products, wood and wood composites, and architectural paint extenders. The particle characterization approach will be employed with emphasis in stereo-binocular microscopy and polarized light microscopy. The course is intended for criminalists performing trace evidence analysis. Firearms examiners with a microscopy background may also find the course useful. Miniature walls/ceilings/floors have been shot, and the bullets collected for a practical examination in determining which bullets passed through which structure. **Participants should bring small vials/containers for transporting slides and samples back to your lab. You will be working with forceps, tungsten needles, and other microscopy supplies during this lab. If you would like to bring your own small particle manipulation toolbox, please feel free to do so. There will only be a few of each tool on hand that will need to be shared by all participants. This lab will have 10-12 students in it.**

The Forensic Examination of Plastic Garbage Bags Ted R. Schwartz, Westchester County Forensic Laboratory (Tuesday 10/20, PM)

Occasionally the Forensic Scientist is asked to compare one or more plastic garbage bags found at a crime scene to bags in an exemplar box of garbage bags. Fortunately, garbage bags possess several class characteristics that can be observed, measured and documented. These characteristics are due to the manufacturing process. In addition, individualizing characteristics can sometimes be observed, which could help establish a positive link between the crime scene bag(s) and the exemplar bags.

In this half-day workshop, background information regarding plastic garbage bags will be presented and the manufacturing process will be discussed. In addition, case studies will be presented. The attendees will be asked to bring a box of large trash bags to the workshop. Hands-on exercises will be conducted to assess various class and individualizing characteristics and comparisons between bags will be conducted.

An Overview of Natural Fibers, Amy Michaud and Leanora Brun-Conti, ATF (Tuesday 10/20)

This workshop will introduce examiners to vegetable and animal fibers used in textiles. Also covered will be microscopical and microchemical techniques to distinguish the different natural fibers. If students can bring microscopes, hands-on examination of known fibers will be conducted. Otherwise, students will view known fibers through the use of either PowerPoints or through the use of a microscope with projection capabilities.

Hair Examination for DNA Analysts, Glenn Schubert, Illinois State Police (Monday 10/19)

Hair is a valuable form of trace evidence but is often ignored or, worse, misunderstood. Hair is an “old school” type of biological evidence, combining aspects of histology, mammology, comparative anatomy, and anthropology. Although it is a type of biological evidence, most DNA analysts—being largely molecular biologists—receive little to no formal training on hair biology, morphology, or examination. This workshop is an **introduction** to hair examination, surveying the growth, morphology, and examination of human and animal hairs and a quick review of microscopy. This workshop is supported through an NIJ award (2003-RC-CX-K001) to WVU's Forensic Science Initiative.

DNA Identifications for Missing Persons and Disasters, Michael Hennessey & Howard Cash, GeneCodes (Tuesday 10/20, AM)

“Missing persons investigations and disasters present DNA analysts with issues not routinely encountered in casework. Post mortem remains are usually disarticulated, commingled, and badly degraded. Multiple samples are often taken from such remains and each sample may undergo multiple testing attempts with different technologies (STRs, Y-STRs, Mito). Tracking and reconciling the results of these different tests is a significant management challenge. And in many instances only partial DNA profiles will result. Meanwhile, reference samples will include family samples, making kinship analysis a central part of the identification effort. This hands-on workshop using data from a mock disaster will introduce these issues and provide a framework for making identifications under such conditions. Specific issues covered will include kinship analysis, statistics, open vs. closed populations, QA, commingled remains, the impact of non-DNA information (anthropology, dental, etc.) and the importance of meta data (sample collection and tracking, chain of custody, etc.).”

ISO Without Tears and Measurement Uncertainty Bill Tilstone, Forensic Quality Services (Sunday 10/18)

This combined workshop is designed to provide an overview of the ISO standards and accreditation process. There will be a review of general and technical requirements, as well as a discussion for agency preparations. The second session is designed to aid current and prospective accredited labs with interpreting ISO 17025. It will also cover, what to measure, how to measure it and how to report it.

Fluorescein Technique for Developing Latent Bloodstains, Pamela McInnis, Pasadena PD & David Rossi, Harris County SD (Sunday 10/18 and Monday 10/19)

This two day course is designed to introduce a different chemical technique for detecting, enhancing, and documenting latent bloodstains. Fluorescein offers a crime scene investigator a safe and easy way to locate and document otherwise invisible bloodstain evidence. Students will become acquainted with two different Fluorescein procedures using lecture and hands on demonstrations. Attendees are asked to bring, if available, an Alternate Light Source, orange/yellow goggles, video/35mm cameras, tripod and barrier filters (515nm, 530nm, 550nm). Crime scene attire preferred. This course is geared for all experience levels.

Hands-On Hyperspectral Imaging: Methods and Applications Rebecca Schuler, ChemImage (Tuesday 10/20, PM)

This workshop will introduce the theory and methods of hyperspectral imaging technology, discuss the various applications of this technology and provide an opportunity for hands-on learning environment. Applications include questioned document examination, finger print imaging on complex backgrounds, bloodstain imaging on dark fabrics, and trace evidence examination.

Charred Document Collection, Analysis, and Preservation Gabe Watts and Gregg Mokrzycki, FBI (Monday 10/19, AM)

This workshop is designed for evidence response teams and document examiners who are interested in a practical, efficient, and organized method of collecting, analyzing, and preserving charred documents. Participants will receive instruction on forensic photographic techniques, stabilization methods, and experience handling and manipulating charred documents using commonly available tools and materials. The workshop fee includes a charred document collection and analysis field kit and a charred document resource notebook.

Valuable Signature Analysis Peter J. Belcastro Jr., FBI (Monday 10/19, PM)

This "Valuable Signature Analysis" workshop will be an abbreviated version of the MAAFS day long fall workshop which was held in Cooperstown, N.Y. on December 4, 2008. This workshop will address the authenticity and detection aspects of valuable signatures to include presidential, athlete, movie star, and musician autographs. We will also discuss investigative and examination techniques, research tools, and industry contacts that may assist in these types of cases. Information from industry representatives will be presented and include their experiences and insight into the topic. This presentation will also include a "behind the scenes" look at various paper and photograph conservation techniques and tools utilized by the Baseball HOF to preserve their treasures.

The Instrumental Analysis of Low Explosives Edward Bender, ATF (Monday 10/19 & Tuesday 10/20)

The workshop will be a comprehensive series of lectures on the instrumental analysis of low explosives. The emphasis will be placed on commonly available techniques such as FTIR, GC/MS and XRF. Additionally, the performance of improvised low explosive devices, the evidentiary value of their components, and the collection and processing of evidence from these devices will be discussed.

**Update and Current Trends in DNA-Biology: methods, techniques, and technologies for source attribution-
Liz Gaffy & Karl Reich, IFI Technologies (Tuesday 10/20)**

The class is designed for DNA analysts who need to understand the principles and methods of body fluid identification as currently available to crime laboratories. Theory and practice of all commercially available tests for the forensic identification of blood, saliva, semen and sperm will be discussed. Interactive, hands-on presentation of lateral flow immunochromatographic strip tests, and fluorescent staining for the identification of sperm from sexual assault evidence, will be included. The proper use and understanding of the modern microscope for DNA analysts will be detailed, including optical staining methods, fluorescence, image capture analysis, and calibration and alignment.

Integration of modern methods of body fluid identification into the work flow of DNA crime laboratories will be discussed, as well as the impact of confirmatory tests on report writing guidelines, laboratory accreditation, and courtroom testimony will be presented. Additional topics include future trends in forensic Biology, including automation, single cell capture, mRNA analysis, and microfluidics.

Forensic Anthropology and Forensic Entomology Workshop- Jason Byrd UFL & Erin Kimmerle, USF (Tuesday 10/20)

This combined workshop will focus on the basics of forensic anthropology and forensic entomology. During the session on forensic anthropology, the participant will learn the basic techniques for creating the biological profile from skeletal remains and will receive instruction on common terminology used in human osteology and will become familiar with the anatomical structure of the major elements of the human skeleton. The session on forensic entomology will focus on the scope and applications forensic entomology in criminal and civil litigation. The participant will learn the proper collection techniques for entomological evidence and will receive basic instruction on scene documentation techniques. Instruction will be provided for proper report contented and common terminology utilized with the field of forensic entomology. Participants will become familiar with the life stages of forensic insects, and will learn to recognize those insects that may be of forensic importance.

Introduction to Forensic Anthropology (1 hr)

Human Osteology & Biological Profiling (1 hr)

Lab Practical for Human Identification (2 hr).

Introduction to Forensic Entomology (2 hr)

Collection Methods (1 hr)

PMI Estimations and Scientific and Legal Report Requirements (1 hr)

End-use Classification of Glass Evidence by Refractive Index and Micro X-ray Fluorescence Spectroscopy-
Ted Berman & Scott Ryland, FDLE Orlando (Sunday 10/18, AM)

Presentation and hands on demonstration of how RI and uXRF can help in classifying the end use of small glass fragments. Often times in crimes involving broken glass it is important to rule out an “alibi source”. This workshop will address techniques including a demonstration of the latest uXRF from EDAX Inc. that can be used to help determine end use of small glass fragments and potentially eliminate these alibi sources as being the origin of recovered glass.

Gizmos and Gadgets a.k.a Tricks of the Trade, Thomas J. Hopen, ATF (Sunday 10/18)

Dr. McCrone always tried to have a “Tricks of the Trade” article in every issue in *The Microscope*. He was a believer that simple techniques and procedures could be applied in the handling, preparation and analysis of small particles. He encouraged analysts to share “tricks” they had developed during an analysis and share it with other analysts through publications, presentations and workshops. In this spirit, this workshop will cover simple and easy techniques in handling small particles plus demonstrate how to make nitrite sticks, sharp tungsten needles, small coverslips, micro-knives, and micro-pipettes as well as other gizmos/gadgets that aid in the preparation and analysis of small samples. Also, procedures in preparing cross-sections (fiber/paint/tape) will be shown plus “tricks” in preparing samples for micro-FTIR and PGC/MS analysis. Participants of the workshop are encouraged to share with the class any “trick” they have found to be useful in the analysis of small particles and will be provided a kit containing goodies that they can take back to the lab.

Y-STR's : Science and Statistics, John Planz (Sunday 10/18)

This workshop serves to provide an overview of the basic biology of the Y chromosome and the Y-STR loci commonly employed in forensic analysis. Commercial kits (Applied Biosystems AmpFISTR® Yfiler® and Promega PowerPlex Y®) will be addressed along with the utility and benefits of Y-STR systems in forensic casework. A discussion of population genetics of Y haplogroups will preface a thorough discussion of haplotype statistics, including the counting method and confidence intervals, haplotype frequencies and population substructure, and probability of exclusion and likelihood ratios for mixtures. Attendees who would benefit from this one day workshop include members of laboratories currently employing Y-STR technology, those considering or in the process of validating a Y-STR system, and those simply interested in a comprehensive overview of the science and statistics of Y-STRs and the power of discrimination offered by Y haplotypes.

Advanced Structure Elucidation: Spectral Interpretation, Robert Ollis, USACIL (Sunday 10/18)

Previous workshops on structure elucidation have focuses on the technologies, capabilities, and calibration of GCMS, LCMS, IR, Raman, and NMR systems. This workshop will focus on spectral interpretation of these technologies that will help the attendee when the unknown spectrum is encountered in case work. It is recommended that before this workshop each attendee review the basics of the systems above as the workshop will focus solely on the spectra. Included in this workshop will be an extensive look at the spectral characteristics of the drug pregabalin (Schedule V). This workshop will consist of brief periods of lecture followed by hands-on group activities. Scientists from all skill levels are encouraged to attend.

Cosmetics Chemistry, Perry Romanowski (Tuesday 10/20, PM)

This workshop will focus on information from the cosmetics industry related to make-up formulations and ingredients. It will concentrate on facial cosmetics including oils, waxes, and other identifiable ingredients in the formulations. The manufacturing process and issues relating to analytical testing will also be discussed. Analytical testing issues that will be addressed include: tagging by manufacturers, batch variations, and the ability to identify a manufacturer by the formulation. The distribution of cosmetic formulas to other cosmetics companies for sale as a specific brand will also be discussed.

The Use of LCMSMS for Forensic Toxicology, Matthew Clabaugh, Applied Biosystems (Tuesday 10/20, PM)

The use of LCMSMS is becoming a routine part of laboratory analysis in the Forensic Toxicology Laboratory.

Today there are many choices with respect to the type of chromatography as well as mass spectrometer. This workshop will give a detailed overview of the different choices facing the laboratory ranging from the use of high resolution HPLC, 2D-HPLC for reduced sample prep and lead into the choice of Mass Spectrometer. The discussion of the mass spectrometer will cover the various types of mass analyzers and discuss the advantages of each type ranging from single stage MS to MSMS.

DEA Forensic Drug Chemist Workshop: Analytical Considerations, Jerry Walker, DEA South Central (Monday 10/19) *Other DEA personnel will be participating*

The objective of this workshop is to present a synopsis of the approach currently being used in DEA laboratories to identify suspected controlled substances and other materials encountered in evidentiary drug analysis. An overview of recent national forensic perspectives and guidelines and its affect on the DEA laboratory system analytical scheme and processes will be covered. Additionally, relatively new analytical techniques that have shown usefulness for difficult samples will be demonstrated. Participants will receive information on confirmatory techniques such as liquid chromatography/mass spectroscopy and ultra pressure liquid chromatography. Additional analytical issues will also be addressed, especially for those in the accreditation process. Contamination concerns and balance measurement uncertainty will be specifically offered. Lastly, several practical applications to the analysis of drug samples will be demonstrated throughout the day. Applying a sampling plan, screening multiple units, analyzing difficult samples, and achieving appropriate separations will be discussed throughout the workshop. At the end of the workshop, a panel discussion will ensue allowing the participants to ask questions to any of the presenters.

DEA Forensic Drug Chemist Workshop: Drug Topics of Interest, Jerry Walker, DEA South Central (Tuesday 10/20) *Other DEA personnel will be participating*

The objective of this workshop is to present information regarding contemporary and relevant drug exhibits received by DEA laboratories. New drug synthesis as well as analytical solutions will be offered as many of these newly encountered compounds have analytical challenges. Reference material will be provided to the attendees.

The DEA laboratory system receives and analyzes a wide variety of controlled substances. Cocaine, heroin, methamphetamine, and marijuana are the majority; however, the laboratories often receive the "oddball" sample. Recently, drug analogues have emerged modifying steroids, piperazines, and tryptamines. New plant materials promising better "highs" than marijuana are becoming prevalent and fentanyl continues to make occasional appearances. Even methamphetamine is undergoing changes in its formulation and analysis results.

DEA spends significant resources on trying to keep up with the analysis and identification of all controlled substances. As stated earlier, there are many challenges associated with the changing drug-use world. A goal of this workshop is to disseminate some of the knowledge DEA laboratories have recently gained.

Since the publication of *PIHKAL* and *TIHKAL*, a fairly rapid succession of chemical analogs of controlled substances (Controlled Substance Analogs, CSA) has appeared on the drug scene. A historical perspective will look at the origination of the term "Designer Drugs", and how this term relates to structural analogs and the CSA act. U. S. Federal Court decisions, some of them conflicting, will be referenced and briefly reviewed in relation to the CSA act. Terminology and important concepts regarding chemical structure will be presented. Factors that may affect

the illicit production of structural analogs of controlled substances will be suggested. A number of representatives of "classes" of controlled substances will be looked at and potential modifications to these structures presented. The most frequently used synthetic routes for phenethylamines and tryptamines will be briefly discussed. Mass spectral data of a number of CSA will be available. A defense strategy using the "Tanimoto Coefficient" will be discussed. There has also been an increase in the seizure of "creative" marijuana products. Candy, chocolate, soda, and a whole host of other food products are being spiked with marijuana. The extraction and subsequent analysis of these samples is problematic. Examples of the products and associated issues with their analysis and equipment maintenance will be provided. In addition, there are new plant materials being received for analysis. Information and reference material on Salvia Divinorum will be distributed.

When was the last time an MDMA tablet was just an MDMA tablet? Data will be presented on the current trends of illicit tablets received by the DEA laboratories. In particular, the workshop will focus on the analysis of tablets with benzylpiperazine (BZP) and trifluoromethylphenylpiperazine (TFMPP). Analytical techniques including separation and quantitation will be provided. In addition, there will be discussion on the sentencing aspect of these compounds. Body enhancement substances have not subsided in recent years. Techniques to analyze human growth hormone and steroids will be presented. Analytical techniques including the separation of steroids from matrixes, instrumental methods, and quantitative information will be shown. Reference material and steroid spectra will be provided to the audience.

Lastly, information on dimethyltryptamine (DMT) and current information on overall drug trends will be discussed. Changes in methamphetamine samples and how to determine isomers, reoccurrence of fentanyl, and initiation of unique samples such as "spice" and the "HU" compounds will be covered. It would be impractical to attempt to include all new drug information in a one-day presentation; however, the presentations will cover as much information as possible during the course of the seven hours of instruction.

Imaging Workflow for Questioned Document Examiners. George Reis, ForensicImaging (Sunday 10/18, PM)

This presentation will focus on using Adobe Photoshop in a non-destructive workflow for image enhancement, analysis, and court chart preparation.

Advances in Analytical Techniques for Analysis of Drugs of Abuse. TBA, Agilent Technologies (Tuesday 10/20, AM)

This discussion will focus on state of the art analytical techniques for the analysis of Drugs of Abuse. Quantitative measurements of large numbers of analytes using Triple Quadrupole LC/MS instrumentation coupled with Rapid Resolution chromatography will be discussed. Additionally, screening techniques involving LC/MS Time-of-Flight instrumentation incorporating the use of accurate mass forensic databases will be reviewed. Low level measurements utilizing nano-HPLC using the Agilent Chip-Cube interface for the determination of drugs and their metabolites from matrices such as hair will also be featured.

Nuisance Plants for Forensic Chemists and Toxicologists Ilene Alford & Nick Tiscione, Palm Beach Cty Sheriff, Mike Healy, Manatee Cty Sheriff (Monday 10/19, AM)

The following plants which are encountered as evidence in the Forensic Lab will be looked at:

Salvia Divinorum Salvia Divinorum is an herb native to Oaxaca, Mexico that has recently become of forensic interest due to its hallucinogenic effects and possible abuse potential. Large numbers of videos on internet video posting sites have led to a significant amount of media coverage and legislation in many states limiting its sale and use. An overview of the history, properties, legal status, and pharmacology will be presented along with analysis methods for the psychoactive component, Salvinorin A, in both plant material and biological specimens.

Psilocybin mushrooms This wonderful fungus which can be encountered on grazing lands next to cow patties. An overview of it and analytical techniques will be discussed.

Angel's Trumpet This decorative plant which people think they can get a cheap high off of. An overview of it and analytical techniques will be discussed.

Special Seminar: Forensic Science Ethics, Jerry A. Walker & Tamara Dellabetta Keller, DEA South Central Laboratory (Thursday 10/22)

Forensic science continues to be “under siege.” National, state, and local organizations are required to answer ethical questions routinely. Some questions are relatively easy and some deal with complex issues. These issues may involve day to day operations or major policy. Ethics is a far reaching concept in the forensic laboratory that includes quality, accreditation, certification, and standards of conduct to state just a few. The objective of this colloquium is to provide a forum to discuss ethic-based issues associated with the organizations involved in the Joint Meeting.

The special seminar consists of lectures presented in the morning from the viewpoint of four levels of a forensic laboratory system: analyst, supervisor, laboratory director, and the head of a laboratory system. These individuals will initiate talking points and provide a perspective on ethical situations based on their different positions. In the afternoon, presentations from the presidents of the SWAFS, MAAFS, SAFS, and MAFS organizations will be made. The presidents will offer discussion on ethical issues important to them and points of view from their positions as leaders of forensic science organizations. Following these presentations, a round table discussion, open to all of the attendees, on the various ethics topics that had been discussed throughout the morning is scheduled.

The focus will then narrow to the forensic science arena. It is important to understand what forensic science is and how every decision that is made affects the world around us. These everyday decisions occur during routine analysis, reporting, and court testimony. There are other day to day activities that are not included in the “definition” of a forensic scientist’s duties that are still important and matter in how they are addressed. For example, how does your organization respond to written and verbal correspondence with people outside of your organization?

For better or for worse, these everyday dilemmas are an integral part of being a forensic scientist and there are many examples of how ethics has changed the way forensic scientists do business. By discussing real life examples and scenarios that we have all encountered in our work, this special seminar will attempt to encourage everyone to take a look at how they perform their daily work and bring about improvements to the forensic science community.