

MAFS 2010 Workshop Abstracts

DRUG CHEMISTRY WORKSHOPS

Mass Spectral Interpretation of Unknowns

Instructor: Eric Person, California State University

Date: Monday, October 4th 8am-5pm

Cost: \$ 150 (includes lunch)

The workshop 8 hour workshop will focus on practical techniques for the evaluation and interpretation of mass spectral data for unknown samples. After a brief introduction to the variety of mass spectrometry instrumentation available, the workshop will focus on the interpretation of electron ionization mass spectral data obtained from common GC-MS instruments. The workshop will use a variety of formats including lecture, discussion, and small group problem solving to explore how mass spectral data for similar known chemicals can be used to understand and interpret data for unknown or novel drug analogs and derivatives. Examples will include phenethylamine, tryptamine, steroid, and benzylpiperazine analogs. Discussion will include the role and limitations of mass spectral interpretation in production-oriented accredited laboratories.

Participants should have a foundational understanding of, and familiarity with, organic structures, GC-MS instrumentation, and fragmentation mass spectra equivalent to that received in an undergraduate instrumental analysis course or typical forensic laboratory training programs in GC-MS instrumentation.

The Chemistry of Clan Labs

Instructor: Tim McKibben, Colorado Bureau of Investigation

Date: Tuesday and Wednesday, October 5th-6th 8am-5pm both days

Cost: \$ 300 (includes lunch both days)

Over the years, many different types of drugs (MDMA, meth, PCP, Fentanyl, LSD, THC, BZP and Cocaine Analogs, etc) have been manufactured under illicit settings.

Information will be presented detailing the synthesis routes used to manufacture these drugs, along with their key precursors, intermediates, or techniques which provide strong indications of which final product is being manufactured. References to specific published literature will also be provided. It is the intent of this presentation to increase the awareness of the investigator/chemist when dealing with a wide variety of illicitly produced drugs.

The Use of LC/MS/MS in Today's Forensic Investigations

Instructor: Matthew Clabaugh, ABSciex

Date: Wednesday, October 6th 1pm-5pm

Cost: \$ 75 (lunch not included)

The use of LC/MS/MS in forensic science has drastically increased over the last 10 years and is now widely used for both qualitative and quantitative analysis. LC/MS/MS provides the ability to analyze a wider molecular weight and polarity range of compounds with better sensitivity, reduced sample preparation and no derivatization, in less time. In the crime labs of today there are many factors that affect the confirmation of drugs. In many labs the bottleneck in casework is the sample prep of a sample for confirmation. The purpose of this talk is to discuss the use of LCMS and LCMSMS for confirmation of drugs with little or no sample prep. Opiates and benzodiazepines have traditionally thought to be most difficult and time consuming due to the hydrolysis, extraction and derivatization. This talk will detail the options available to forensic scientists with respect to HPLC and Mass Spec options. We will discuss high speed HPLC, column selection as well as a details discussion of the different type of Mass Spectrometers.

Biology/DNA Workshops

Basic DNA Statistics

Instructor: George Carmody, Carleton University

Date: Monday, October 4th 8am-Noon

Cost: \$ 100 (lunch not included)

This half-day workshop will cover the basic ideas of population genetics as the background for calculating the random match probability (RMP). It will also cover the application of these ideas to interpretation of the exclusion probability (CPE) for DNA mixtures and paternity in casework. The recommendations of the NRC II Committee will be included in the presentation. Examples of hands-on calculations will be done by those attending the workshop.

Courtroom Presentation of DNA Statistics

Instructor: George Carmody, Carleton University

Date: Monday, October 4th 1pm-5pm

Cost: \$ 100 (lunch not included)

This half-day workshop will cover the application of the probability of exclusion (CPE) and likelihood ratio (LR) calculations to DNA mixture and paternity casework. Examples will be given where one or the other is "better". The emphasis will be on understanding these concepts (CPE and LR) so that an analyst can present them effectively in court.

Bloodstain Pattern Analysis for DNA Analysts

Instructors: Michael J. Van Stratton, Kansas Bureau of Investigation

Kevin R. Winer, Kansas City Missouri Police Department Crime Lab

Date: Tuesday, October 5th 8am-5pm

Cost: \$ 150 (lunch included)

Maximum of 24 students

An objective of the workshop is to provide the student with a background in basic bloodstain pattern analysis. Pattern analysis at crime scenes will then be applied to clothing examinations. Determining how stains were deposited will assist in sample selection for DNA testing. To maximize the amount of information gleaned from bloodstained clothing, applying the clothing examination results with the context of the case, may serve to reconstruct the person's involvement, or lack thereof, in the events that transpired. Students will have the opportunity to examine bloodstained clothing for pattern identification and reconstruct the wearer's involvement.

An overview of DNA typing in capillary based systems with special emphasis on LCN DNA and mixtures

Instructor: Bruce McCord, Florida International University

Date: Tuesday, October 5th 8am-5pm

Cost: \$ 150 (lunch included)

This workshop will review the fundamentals of DNA analysis by capillary based sequencers. The program will start with an overview of the principles of electrophoresis as applied to DNA typing. Then a basic review will be given of the issues surrounding validation and setting thresholds. Particular emphasis will be placed on the developing guidelines to deal with the issues of LCN DNA /touch samples and mixture analysis. Instrument design, effects of PCR inhibition and maintenance/troubleshooting will also be covered.

Joint Latent Print and Biology Symposium

Date: Wednesday, October 6th 8am-5pm

Cost: \$ 150 (lunch included)

Items of evidence are routinely submitted to crime labs with both biology and latent print examination requests. Advances in both disciplines has made processing single items for biology and latent prints challenging, if not impossible in some circumstances. This joint symposium will facilitate an open discussion about techniques, problems, and solutions for biologists and latent print examiners. Presentations will include brief overviews of each discipline's respective processing techniques and how these techniques affect the ability for the other discipline to obtain results. Additional presentations will cover research findings on simultaneous processing of samples for biology and latent prints as well as procedures in place in specific laboratories which deal with these issues. The symposium will focus on open discussion between all attendees in an effort to share information, problems, and solutions.

Trace Evidence Workshops

An Introduction to Microchemical Testing for Trace Evidence Analysts

Instructor: Skip Palenik, Microtrace

Date: Monday, October 4th 8am-5pm

Cost: \$ 200 (lunch included)

Since it is never a part of a chemist's academic curriculum anymore, microchemistry is assumed by the great majority of young scientists to have been entirely supplanted by instrumental methods of analysis. When the topic does come up it is assumed that microchemistry consists of performing solubility tests on paint, conducting microcrystal tests for drugs or merely "conducting a color test." This one-day workshop will attempt to dispel these misconceptions by introducing trace evidence analysts to the theory and practice of microchemical testing and analysis. The emphasis will be on technique with a variety of tests and procedures introduced to demonstrate the practical utility of microchemical methods in the trace evidence laboratory. The techniques and rationale of working on microscope slides, in capillary tubes, performing spot tests on filter paper and individual fibers, etc. will be demonstrated and practiced. Although only a limited number of actual tests will be performed, they will be selected to demonstrate the range of cations, anions, compounds, functional groups, complex substances and mixtures to which this method can be applied. If time permits we will also explore the simultaneous use of microchemical and spectroscopic methods to more fully understand the chemistry of the material under investigation.

Fabric Impression Evidence

Instructor: Glenn Schubert, Illinois State Police

Date: Monday, October 4th, 8am-5pm

Cost: \$ 150 (includes lunch)

Fabric Impressions can be seen criminal in cases like homicides, sexual assaults, burglaries and hit-and-run. They are produced by adding or removing material from the surface of an object when clothing items contact it. This class will cover methods of transfers and techniques for detection, collection, preservation and comparison of fabric impressions. Discussion and hands-on practice of these areas will be conducted. We will also discuss how to report out this type of evidence and how to present it in court. Several cases will be presented and discussed.

Micro X-Ray Fluorescence Spectroscopy and Forensic Applications

Instructor: Scott Ryland, Florida Department of Law Enforcement

Date: Tuesday, October 5th 8am-5pm

Cost: \$ 150 (lunch included)

The workshop is lecture based and will focus on elemental analysis in forensic science. The basic theory of micro X-ray fluorescence spectroscopy (MXRF) will be discussed, including the physics of the process, the instrument components (X-ray source and X-ray detector) and how they affect the acquired data, spectral characteristic peaks versus spectral artifact peaks and how to recognize the latter, and the background continuum resulting from Compton and Raleigh scatter. The two basic types of instruments available on the market will be described, including the SEM column MXRF and the stand-alone bench-top MXRF, highlighting both their advantages and disadvantages. Quality control considerations will be outlined along with data applications including qualitative, semi-quantitative, and quantitative analyses. The afternoon session will concentrate on detailed micro-XRF forensic analyses of materials such as paint, glass, plastics, adhesives, metals, etc. Special consideration will be given to classifications and comparisons as an aid to trace evidence associations, concentrating on sampling strategies, data interpretation, and improving precision in analysis of these types of materials.

Practical UV-visible-NIR Microspectroscopy for the Forensic Scientist

Instructor: Paul Martin, CRAIC Technologies

Date: Wednesday, October 6th 8am-5pm

Cost: \$ 150 (lunch included)

Many labs currently already have or are budgeting UV-visible-NIR microspectrophotometers for the analysis of fibers, paints and questioned documents. The purpose of this class is to provide the scientist with the tools to both use the instrument and analyze the resultant data. Towards that end, the workshop will describe the basic layout and optics of a UV-visible-NIR microspectrophotometer and how to set it up to analyze different types of evidence. Tips and suggestions for sample preparation and acquiring the best quality data, maintaining ISO and ASCLD protocol compliance as well as basic maintenance of such instruments will be discussed. Another section will introduce the analytical skills used with UV-visible-NIR spectra as well as tips and suggestions on what to look for in the spectra. Finally, an advanced section will provide information on more sophisticated analytical techniques that can be applied to your data ranging from simple arithmetic to sophisticated statistical analysis. At the end of the day, there will be an extensive round table, moderated by the instructor, in which the students will participate with comments, experiences and questions.

Raman: Sampling, Analysis and Interpretation Workshop

Instructor: Kenneth Smith, Thermo Fisher Scientific

Date: Wednesday, October 6th 8am-noon

Cost: \$ 75 (lunch not included)

The use of both macro and micro infrared spectroscopy is well-established in the crime lab. In a macro mode, it is used primarily for drug analysis while the micro mode is used for trace evidence. Recently, there has been a growing interest in using Raman spectroscopy as a compliment to infrared spectroscopy. Raman spectroscopy offers several advantages over infrared spectroscopy. Raman analysis can be performed on solids and liquids (including water), in both macro and micro modes. In the macro mode, unknown liquid and solid samples can be analyzed through glass vials. In the micro mode, samples that are in the 1 to 2 micron range can be analyzed. This is ten times better spatial resolution than infrared spectroscopy. This allows the examination of individual drugs and diluent crystals. It also allows the probing of individual paint layers “in situ” with little or no sample preparation. Analysis applications will be presented and samples will be run to show the utility of Raman spectroscopy for drug analysis, fiber identification and comparison, paint analysis, and explosives. A comparison of the two dominate Raman techniques (FT and dispersive) will also be discussed as well as how they compliment FTIR.

Latent Print Workshops

Analysis of Distortion in Latent Prints

Instructor: Alice Maceo, Las Vegas Metropolitan Police Department Forensic Laboratory

Date: Monday, October 4th 8am-5pm

Cost: \$ 225 (lunch included)

All impressions of the friction ridge skin bear distortion. Each time the skin contacts a surface, a combination of factors influence the final appearance. Each touch is different and deforms the skin in its own way, creating variation in appearance among impressions of the same area of friction ridge skin. How do pressure and movement affect the appearance of the skin? What are the clues that allow a trained scientist to explain variation in appearance by reconstructing the touch? This one-day workshop focuses on the Analysis phase of the ACE-V process as it pertains to the various factors that contribute to distortion of latent prints.

The following information will be presented to the attendees:

- Anatomy of the hand

- Basis for uniqueness and persistence of friction ridge skin

- Effect of condition of the skin on the appearance of latent prints

- Effect of the residue (matrix) on the appearance of latent prints

- Effect of the mechanics of touch on the appearance of latent prints

- Effect of the surface (substrate) on the appearance of latent prints

- Analysis of deposition pressure and wobble

- Analysis of horizontal and vertical shearing stress

- Analysis of torque (rotation)

- Application of skills to “real world” latent prints

Latent Print Advanced Testimony

Instructor: Melissa Gische, FBI Laboratory

Date: Tuesday, October 5th 8am-5pm

Cost: \$ 175 (lunch included)

Maximum of 30 students

As the scientific reliability of friction ridge evidence continues to be challenged, latent print examiners must be prepared to defend their science in the courtroom. Not only do examiners need to be able to discuss these topics in an admissibility hearing, but they also need to be prepared to respond during cross-examination of trial testimony. The recent National Academy of Sciences report entitled "Strengthening Forensic Science in the United States: A Path Forward," identified perceived weaknesses in the forensic sciences and has already generated challenges in the courtroom. It is now more important than ever for fingerprint examiners to effectively communicate why, and demonstrate how, friction ridge science is reliable. This 1-day course of instruction is designed for latent print examiners. Through presentations and group discussions, students will learn how to testify to the scientific reliability of friction ridge evidence and formulate responses to defense-related arguments.

Joint Latent Print and Biology Symposium

Date: Wednesday, October 6th 8am-5pm

Cost: \$ 150 (lunch included)

Please refer to the abstract listed under Biology/DNA.

General Workshops

Accreditation of Forensic Science Laboratories under ISO 17025:2005 Understanding the Importance of BUY-IN throughout the ASCLD/LAB International Accreditation Process

Instructor: Joseph P. Bono, MA, Indiana University Purdue University Indianapolis

Date: Monday, October 4th 8am-5pm

Cost: \$ 125 (lunch included)

The objective of this workshop is to present practical information that laboratory staff and management can easily utilize to address the requirements of an ASCLD/LAB International (ISO) accreditation assessment. The presentations will include suggestions for preparing the documentation necessary for accreditation under ISO/IEC 17025:2005 General Requirements for the competence of testing and calibration laboratories and American Society of Crime Laboratory Directors/Laboratory Accreditation Board International (ASCLD/LAB-International) Program. An important element of this workshop will be a panel discussion session addressing policies and procedures required to meet the accreditation requirements. One question to be addressed is: How can policies and procedures be formulated to meet the requirements of the accrediting body? Participants on the panel will be members of management from laboratories that have been accredited or are preparing for accreditation by ASCLD/LAB- International. The discussions in this workshop will be candid and will focus on how sound laboratory systems are further improved by addressing the ISO/IEC 17025 and ASCLD/LAB-International requirements. The goal is to present practical suggestions for laboratory managers in developing viable, practical approaches to achieving accreditation and maintaining an ISO accreditation program in a forensic science laboratory.

Integrity, Character and Ethics in the Forensic Sciences

Instructor: Dan Gunnell, Forensic Training Associates

Date: Tuesday October 5th 8am-5pm

Cost: \$ 200 (lunch included)

Ethics is one of the greatest challenges facing law enforcement today. If possible, this is even more true for Forensics. Today the Forensic Science community is increasingly under public scrutiny for all of its actions, making it essential that everyone is aware of the tremendous responsibility that they have and what is expected of them. The goal of this presentation is to provide individuals within the Forensic Science community a heightened awareness of both the ethical and value based issues that impact on their ability to perform their duties. Topics covered will include:

- Value Development
- The Ethical Continuum
- The Rationalized Left Shift
- Martin's Law of Compounding Error
- The Hammer Model of Scientific Misconduct
- The DOOR model for issue resolution
- Video Case Studies of actual Forensic Misconduct Cases

PowerPoint® for Forensic Science™

Instructor: Thomas Manson, Police Technical

Date: Wednesday, October 6th 8am-5pm

Cost: \$ 200 (lunch included)

95% of personnel using PowerPoint® are “self-taught”

Most have never had a “mission specific” structured course in computer applications.

As the flagship course of Police Technical, PowerPoint® for Public Safety™ is designed to help all public safety personnel become more efficient and proficient with PowerPoint®. Go beyond text on a slide, there's much more to PowerPoint®. Topics include:

1. Before PowerPoint® - Presentation Skills, Practice and Preparation
2. Building Presentations - Standard methods, *Fast Development*
3. Saving Presentations
4. Package for CD – Creating Presentations that Everybody Can Access
5. Best Practices for Printing Presentations
6. Splash Screens – Manage your presentations
7. Custom Animation – Use PowerPoint® to visual depict procedures
8. Capturing Images – Scanners, Digital Camera
9. Capturing Audio and Video – From YOUTUBE and DVDs

Questioned Documents Workshops

*** Attendees will register for the QD block, not for individual workshops. Lunch is included each day***

QD Imaging Workshop

Instructor: George Reis, Imaging Forensics

Date: Monday, October 4th 8am-5pm

This is a hands-on workshop using Adobe Photoshop in a questioned document workflow. It will cover the basics of an efficient workflow, best practices, using Photoshop actions, and work with analysis and enhancement of tracings, VSC images, ESDA images, and more! We will also be creating multi-page court charts using Layer Comps. This workshop will move quickly, but will also keep a solid foundation.

The Science of Identification

Instructor: Stephen McKasson, Document Consulting Service

Date: Tuesday & Wednesday, October 5th & 6th 8am-5pm both days

Identification science rests upon two pillars. One that uniqueness exists throughout the natural world; and two that humans can recognize similarities and differences when comparing objects. To support the legitimacy of identification science we can look at other scientific fields to see how the same two principles are applied in order to establish that these principles are accepted throughout the scientific community. The value and use of models to represent our identification paradigm will be discussed, and models will be presented which unite all of the forensic identification fields. Some of these models have been used for decades to help juries understand what we do; and as training aids for new examiners. Problems can arise when experienced examiners try to show that their methods adhere to the model rather than the more accurate representation that the model describes their methods.

Typewriter Classification for the Forensic Document Examiner

Instructor: Andrew Szymanski, D-ABFDE, Lake County Crime Lab

Date: Thursday, October 7th 1pm-5pm

This half day “hands-on” workshop will include a presentation and demonstration of the Bouffard “Type” Classification Program and its search capabilities for the classification of typewritten documents. Attendees of the workshop will be instructed to recognize different tpestyle groups, search utilizing the “Type” classification system and classify practical typewriter case problems. The goal of the workshop is for the attendee to have an understanding of the “Type” program as it is used in a typewriter classification search. Attendees will also be instructed on the preferred procedure of the “Type” program and the Haas Atlas reference collection.