



WORKSHOPS

Trace Evidence

Low Explosive Analysis

Instructor: Raleigh Parrott

Monday September 18th – Full Day in Tyler Davidson I

Fee = \$250

Abstract:

Explosives have been around for thousands of years. The applications and utility of explosives have helped to shape our world in both good and destructive ways. While simple chemistry can be utilized in the production of explosives, their effects and behaviors are still being tested today. Included within this workshop will be topic areas to include: the chemistry of explosives, the physical effects of explosives, evidence collection, the analysis of low explosive materials, the analysis of low explosive residues, and case studies involving low explosives.

Bio:

Mr. Parrott is currently a Chemist–Forensic Examiner for the FBI Laboratory in Quantico, VA. His area of expertise is in the analysis of explosives and residues of explosive materials.

Mr. Parrott earned his M.S. in Chemistry from Illinois State University in 2007. Upon graduation, he accepted a fellowship position with the Counterterrorism and Forensic Science Research Unit at the FBI Laboratory, where he developed techniques to screen for biological threat agents and explosive materials. After his research, he began processing improvised explosive devices (IEDs) for trace evidence and then later for the chemical analysis of explosives.

Mr. Parrott has been involved in the area of explosives and IEDs since 2008 and was qualified as a Forensic Examiner for the FBI Laboratory in 2011. Since that time, he has conducted thousands of examinations on explosives materials from IEDs around the world. In 2013, he was deployed to Afghanistan as an explosives expert and assisted in the utility of explosives

chemistry in their judicial system. Since then, he has also deployed to various locations around the globe for assistance with explosive cases and training. In addition, he has testified in both international and domestic courts as an expert witness. He currently serves as the training coordinator for the Explosives Unit and has been the lead trainer for chemists in that unit since 2013.

Basic Fiber Analysis

Instructor: Jon Burdett

Monday September 18th – ½ Day Morning in [Tyler Davidson II](#)

Fee = \$125

Abstract:

This workshop is designed to introduce trace evidence examiners to the full complement of techniques utilized for the analysis of textile fibers, with a specific focus on the science behind UV-VIS-NIR microspectrophotometry and its applications to textile fiber analysis.

Textile fibers are a critical piece of the evidence chain in many forensic cases, and known and questioned samples have to undergo many different tests in order to provide confidence in their discrimination. This workshop will discuss the process of discriminating between known and questioned fibers through the qualitative analysis of stereoscopic analysis and polarized light microscopy and the quantitative analysis of both UV-VIS-NIR microspectrophotometry and Fourier Transform Infrared spectroscopy. There will also be a demonstration of a UV-VIS-NIR microspectrophotometer and discussion of common issues in this analysis. By the end of the workshop, trace evidence examiners will know the techniques and points of discrimination for the analysis of textile fibers.

Bio:

Dr. Jon Burdett received his Ph.D. in Physical Chemistry from the University of California, Riverside, where his research focused around time resolved spectroscopy. He has entered the forensics world when he joined the team at CRAIC Technologies in 2014. From this position, he has applied his strong background in spectroscopy and optics to the trace evidence field by leading workshops on the methods of applying microspectroscopy to trace evidence analysis of textile fibers and paints.

Hair Evidence – Still NOT Junk Science!

Instructor: Amy Michaud

Monday September 19th – ½ Day Afternoon in [Tyler Davidson II](#)

Fee = \$125

Abstract:

This half day work shop is aimed towards the new hair examiner or biologist as well as those in management or the legal profession who might benefit from knowing more about hair evidence and its role in investigations. This course will briefly discuss what can be determined from a human hair examination and comparison (e.g. race, somatic origin, suitability for microscopical comparison and/or nuclear or mitochondrial DNA analysis). Case examples will be presented along with discussion about interpretation and language used in reports and testimony today as opposed to language used in the past. Challenges to hair evidence brought about by PCAST and the FBI evaluation of past cases will also be discussed.

Bio:

Ms. Michaud started out her career in 1989 working for the Michigan State Police Crime Laboratory system examining evidence and processing crime scenes in the Trace Evidence Unit. After eleven years with MSP, Ms. Michaud went to work for the FBI Laboratory's Trace Evidence Unit for almost 6 years where she examined primarily hairs, fibers, and fabrics/cordage. During that time she also worked with the Smithsonian Institution's Department of Anthropology to process casework requiring anthropological examinations. Currently, Ms. Michaud is a Forensic Chemist with the ATF Laboratory and since January of 2005 she has been conducting examinations there in a variety of areas of trace evidence including hairs. She has served on the Scientific Working Group for Materials Analysts (SWGMA) Hair Sub-group and on the Organization of Scientific Area Committees (OSAC) Materials Sub-group.

Basic SEM Analysis

Instructors: Frank Platek & Stefanie Heckman

Tuesday September 19th – Full Day in [Tyler Davidson I](#)

Fee = \$250

Abstract:

This one day course will cover the basic theory and instrumentation related to Scanning Electron Microscopy (SEM) and Energy Dispersive X-Ray Spectrometry (EDS). Training will cover electron and x-ray production and detection, image and spectra interpretation, sample preparation tools and techniques, instrument calibration, and basic approaches to samples analyses. In addition, a portion of the course will be devoted to actual case analyses using SEM/EDS. This course will include many types of sample analyses including paint, metals, unknown particles and gunshot residue. Attendees are encouraged to bring a laptop computer to the class as course material will be provided in a digital format.

Bio:

S. Frank Platek received a BS degree in Biology with a minor in Chemistry and Agriculture from Murray State University in 1974. He received a MS degree in Industrial Hygiene from the University of Cincinnati, College of Medicine in 1988.

Mr. Platek is internationally recognized in the area of research and applications of light microscopy and scanning electron microscopy to forensic science including particle microanalysis. For more than 40 years, his microscopy career has included research in pathology coupled with more than 25 years of forensic investigations and research.

In 1976, Mr. Platek worked as a research biologist at the National Institute for Occupational Safety and Health (NIOSH) utilizing the tools of polarizing light microscopy, TEM and SEM in human pathology research studies. In 1991, Mr. Platek was recruited by the Food and Drug Administration's prestigious Forensic Chemistry Center (FCC) to establish a unique microscopy analysis and research section. As the Team Leader, he helped to develop a full trace evidence section.

Mr. Platek has been an adjunct faculty member at Northern Kentucky University since 1982 and in that capacity instructed hundreds of students in SEM/EDS theory, operation and applications. Since 1995, Mr. Platek has been a lecturer in Lehigh University's, Lehigh Microscopy School in Bethlehem, PA. In 2014, Mr. Platek was invited to be a member of the National Institute of Standards and Technology (NIST), Organization of Scientific Area Committees (OSAC) Forensic Gunshot Residue sub-committee. Mr. Platek is a member of American Academy of Forensic Sciences, Mid-Western Association of Forensic Scientists, Microscopy Society of America and Microscopy Society of the Ohio River Valley. He has more than 100 professional presentations, 37 publications and one patent. He served a number of years as an invited national tour speaker for the both the Microscopy Society of America and the Microbeam Analysis Society. In 2015, Mr. Platek was elected a Fellow of the Microscopy Society of America.

Stefanie has been working as a forensic scientist for ten years. She has been employed at the Food and Drug Administration Forensic Chemistry Center for over seven years, specializing in the use of light and electron microscopy in the trace evidence section. Her casework includes the examination of suspected product tamperings, needle punctures, and detection of counterfeit FDA-regulated products. Prior to joining the FDA, Stefanie was a forensic scientist in the trace evidence section at the Hamilton County Crime Laboratory. There, she performed casework in traditional trace evidence fields including gunshot residue, hair analysis, low explosives, and miscellaneous unknown identifications.

Stefanie has been an adjunct faculty member at Thomas More College, instructing students in general forensic science courses. She obtained a Master of Science in Forensic Science from Michigan State University and a Bachelor of Arts in Biology from Thomas More College. Stefanie is a Regular Member of the Midwestern Association of Forensic Scientists, a Charter Member of the American Society of Trace Evidence Examiners, a Diplomate with the American Board of Criminalistics, and a Member of the American Academy of Forensic Sciences.

Petroleum-laced Background Matrix Interpretation in Fire Debris Analysis

Instructor: Mary Williams

Tuesday September 19th – ½ Day Morning in Tyler Davidson II

Fee = \$125

Abstract:

This half day course will provide students an understanding of how materials decompose to create compounds that interfere with the interpretation of ignitable liquid residues in fire debris. There will be a discussion of the chemical reactions involved during the thermal decomposition process. Different methods of burning materials to produce these products will be introduced. The types of combustion/pyrolysis compounds identified in different materials will be studied. A survey of the scientific literature and databases will be conducted to determine whether these compounds have been identified in ignitable liquid residues. The survey will also include whether these interfering compounds yield similar chromatographic patterns as ignitable liquids residues. Various tools and methods will be explored to aid in the interpretation of the gas chromatography mass spectrometry data for a determination of the presence of an ignitable liquid residue in the presence of combustion/pyrolysis products from decomposition of materials at the fire scene.

Prerequisites: basic understanding of fire debris analysis.

Bio:

Mary received her Bachelors of Science and Masters of Science in Forensic Science from the University of Central Florida. She has been employed by the National Center for Forensic Science (NCFS) at the University of Central Florida since 1999. Mary has collaborated with the Scientific Working Group for Fire and Explosions (SWGEX) for 17 years in the development and administration of the Ignitable liquids Reference Collection, Substrate, and Smokeless Powders databases. Collaboration with the Fire and Explosions Investigation working group of the European Network of Forensic Science Institutes (ENFSI FEIWG) for the past three years has generated the International Database of Ignitable Liquids which contains data from 22 European countries. Mary performs research at NCFS with Dr. Michael Sigman which has produced 14 publications with an additional two in press. The majority of her research is in the field of fire debris.

What's in that Dust?

An introduction to the analysis of dust for the forensic and environmental scientist

Instructor: Skip Palenik

Wednesday September 20th – Full Day in Tyler Davidson I

Fee = \$250

Abstract:

To Edmond Locard, the terms *dust* and *trace evidence* both amounted to much the same thing and the great German chemist Liebig referred to dust as "matter in the wrong place." The purpose of this class is to provide a practical introduction to the identification of the components of dust by means of microscopy and microchemistry, as well as to the principles by which the information obtained may be interpreted.

After a general introduction to the topic, the workshop will be conducted by means of lecture-demonstrations followed by practical laboratory sessions, in which the attendees will have the opportunity to examine a variety of dusts, including those which they themselves bring with them.

The manner in which a dust sample has been collected has an important bearing on the techniques used to examine it. Dust may be received as a loose powder, from vacuuming, as scrapings, adhering to adhesive tape, as smears, on cotton swabs and cloth wipes to name just some of the most commonly encountered substrates. The methods of working with some of these substrates will be demonstrated and students will have the opportunity to try some of them, if they wish to avail themselves of the opportunity.

Some of the particles and substances which frequently comprise dust and that can be identified on the basis of their microscopic morphology, optical crystallographic properties, fluorescence characteristics and chemical and physical properties will be illustrated and explained through the microscope by projection. Particles that require specialized analytical instrumentation for certain identification will be pointed out when encountered and the techniques of dealing with them will be described, specifically with respect to types of information that may be obtained from them.

Students will then try their hand at examining both known and "questioned" dusts from substrates of their own choosing while being coached in their observations and as to the types of tests that might be applied to identify unknown particles with the available resources. Most importantly, it is hoped to demonstrate that useful, demonstrable results are obtained, not just by going through the motions, but of thinking critically as the examination proceeds by building up a mental image of an environment as each component is identified.

Prerequisite. Attendees should have a background in analytical microscopy equivalent to the that provided by the Applied Polarized Light Microscopy course offered by McCrone Research Institute.

Bio:

Skip Palenik has had a lifelong fascination with the microscope that started when he received his first instrument at the age of eight. Since then he has devoted himself to increasing his knowledge of analytical microscopy and microchemistry and applying it to the solution of real world problems, especially those of forensic interest. He was fortunate in having worked closely with his mentor, Dr. Walter McCrone, for over thirty years and to have studied forensic microscopy with Dr. Max Frei-Sulzer of Zurich, a disciple of Dr. Edmond Locard of Lyon. Skip has been teaching analytical microscopy to forensic scientists for more than forty years and has published numerous scientific articles and book chapters on the applications of chemical and forensic microscopy. His most recent contribution is a chapter on the use of heavy minerals in forensic science published by Elsevier. He has also played a significant role in numerous criminal investigations including the Atlanta Child Murders, the Air India Bombing, Jon Benet Ramsey case, Narita Airport bombing (Tokyo), Hillside Strangler (Los Angeles) cases, Oklahoma City bombing, Ivan the Terrible (Jerusalem), Assassination of Dr. Martin Luther King (reinvestigation by U.S. House Select Committee on Assassinations), the Unabomber, the disappearance of Helen Brach, The "Kiki" Camarena Murder Case and the Green River Serial Murders. He established Microtrace in 1992 to provide a resource for organizations and individuals in need of scientific services involving the analysis of microscopic trace evidence. His special research interests are the identification of single small particles, small amounts of complete unknowns and tracing dust and soil back to their origins. He is the 2009 recipient of the Paul L. Kirk Award, the highest award given by the criminalistics section of the American Academy of Forensic Sciences, the 2013 Ernst Abbe Award for outstanding contributions to microscopy, the 2013 Edmund Locard Award presented by the American Society of Trace Evidence Examiners, and the Chamot Medal in chemical microscopy in 2010. He is listed in American Men and Women of Science.

Ensuring Thorough and Fair Evaluation of Limitations during the Footwear Examination Process

Instructor: Lesley Hammer

Wednesday September 20th – ½ Day Morning in [Tyler Davidson II](#)

Fee = \$125

Abstract:

Footwear evidence may have a variety of conditions that effect the full evaluation of characteristics. These conditions may be caused by substrate, matrix or deposition circumstances, by collection methods used, by the way the impression was photographed, or by a multitude of other environmental factors. These conditions affect the amount and clarity of detail that is available for evaluation and comparison. When limiting conditions are encountered, it is important to document and report their presence and the limitations to the evaluation that are created. This workshop will explore limitations that are encountered in

footwear evidence examinations, discuss what qualities and characteristics are affected, and practice identifying and articulating those limitations in notes and reports.

Bio:

Lesley Hammer is a Forensic Examiner from Anchorage Alaska, currently in private practice, with experience in forensic casework, laboratory supervision and scientific instruction. She has performed analyses, reported and testified in latent print, footwear and tire track, crime scene and controlled substance disciplines. She holds professional certifications in Forensic Footwear Examination with the International Association for Identification and the Canadian Identification Society and in Criminalistics from the American Board of Criminalists. Ms. Hammer has supervised a Forensic Physical Unit in an accredited laboratory, published articles, performed research and provides forensic evidence related instruction to law enforcement, crime laboratory personnel and others throughout the United States and in Canada. She holds a BA in Environmental Science from Alaska Pacific University, an MA in Teaching from the University of Alaska, and an MSc in Forensics from the University of Strathclyde in Glasgow, Scotland. She is past Chair of the Scientific Working Group on Shoe and Tire Tread Evidence (SWGTHREAD), is the current Vice Chair of the Physics and Pattern Evidence Scientific Area Committee of the Organization of Scientific Area Committees and is a past President of the International Association for Identification.

Testifying about the Methods and Foundations of Footwear Evidence

Instructor: Lesley Hammer

Wednesday September 20th – ½ Day Afternoon in [Tyler Davidson II](#)

Fee = \$125

Abstract:

Testimony in forensic casework may quickly turn into a defense of the discipline. This may occur casually and on the spot with questions from attorneys, or very formally in an admissibility hearing. This workshop will discuss the types of questions encountered, provide a list of resources including texts, articles, standards and position statements, and provide practice sessions for formulating and delivering answers to these challenges.

Bio:

Lesley Hammer is a Forensic Examiner from Anchorage Alaska, currently in private practice, with experience in forensic casework, laboratory supervision and scientific instruction. She has performed analyses, reported and testified in latent print, footwear and tire track, crime scene and controlled substance disciplines. She holds professional certifications in Forensic Footwear Examination with the International Association for Identification and the Canadian

Identification Society and in Criminalistics from the American Board of Criminalists. Ms. Hammer has supervised a Forensic Physical Unit in an accredited laboratory, published articles, performed research and provides forensic evidence related instruction to law enforcement, crime laboratory personnel and others throughout the United States and in Canada. She holds a BA in Environmental Science from Alaska Pacific University, an MA in Teaching from the University of Alaska, and an MSc in Forensics from the University of Strathclyde in Glasgow, Scotland. She is past Chair of the Scientific Working Group on Shoe and Tire Tread Evidence (SWGTTREAD), is the current Vice Chair of the Physics and Pattern Evidence Scientific Area Committee of the Organization of Scientific Area Committees and is a past President of the International Association for Identification.

Drug Chemistry

Chemistry Refresher

Instructor: Rebecca Barlag

Monday September 18th – ½ Day Morning in Taft I

Fee = \$125

Abstract:

The Chemistry Refresher for Drug Chemists Workshop will focus on reviewing key topics in general chemistry encountered daily by drug chemists. These topics will include a review of polarity, intermolecular forces, solubility, aqueous equilibria, acid-base chemistry, and solvent extraction methods. If time permits, a basic review of chromatography and instrumentation will be provided.

Bio:

Dr. Rebecca Barlag is an Associate Lecturer in the Department of Chemistry and Biochemistry and the Director of the Forensic Chemistry Program at Ohio University. Dr. Barlag is a 1998 graduate of the program and received her Ph.D. in Analytical Chemistry from the University of Cincinnati in 2004. She joined the Chemistry Department faculty in September of the same year and has taught courses in the General Chemistry, Analytical Chemistry, and Forensic Chemistry curricula.

Dr. Barlag has been an academic advisor for the forensic chemistry students since 2009 and oversees a small group of students working on projects to improve their forensic-analytical research skills. She has published 27 articles in peer-reviewed journals since 2007, most of which involved research by forensic chemistry students in the area of laboratory education. She serves on several department committees as well as the University Curriculum Council.

Dr. Barlag has been a member of the American Chemical Society since 2000 and has recently become a member of the American Academy of Forensic Sciences (AAFS) and the Forensic Science Institute of Ohio (FSIO).

Sampling Seized Drugs: A Refresher on the Hypergeometric Approach

Instructor: Sandra Rodriguez

Monday September 18th – ½ Day Afternoon in **Taft I**

Fee = \$125

Abstract:

The first part of the workshop will provide attendees with background and historical information on sampling principles, how sampling is defined by international and accrediting bodies, and emphasize the importance and need for laboratory sampling policies. The instructor will review important statistical concepts needed for understanding the main objective of statistical analysis – *making inferences on a population*. This will include the concepts of random and arbitrary sampling, continuous and discrete variables, and differences between commonly encountered frequency distributions. Emphasis will be given to the binomial and hypergeometric distributions, and the concepts of sampling with and without replacement. The differences between the frequentist and Bayesian approach will also be presented. Attendees will become familiar with the hypergeometric distribution and its application during the sampling of suspected controlled substances. The concepts of hypothesis testing, p -values, and type I and type II errors will also be presented and discussed. The instructor will also guide the audience through calculations using the hypergeometric equation and the generation of sampling laboratory tables. Scenarios where negative results are encountered will also be discussed. The workshop is also expected to encourage discussion of examples and analogies as effective tools for the communication of statistical concepts to a layperson audience.

Supplies needed: Notebook, pencil and calculator

Bio:

Sandra has been employed at DEA Southwest Laboratory since 2002. She has been a laboratory training officer since 2005. She is a subject matter expert (instructor) at DEA Academy (Quantico, VA). She was involved in the drafting and revision of DEA Analysis of Drugs Manual and policies for Performance Verification Procedures, Measurement Uncertainty, Method Validation, Sampling, etc. She conducted internal/external training on LC-MS, Measurement Uncertainty, Method Validation, and Sampling and has given dozens of presentations, lectures, and publications. Sandra is I member of the following organizations:

American Academy of Forensic Sciences (AAFS), Fellow; Clandestine Laboratory Investigating Chemists (CLIC); ASTM International; SWGDRUG Core Committee – Secretariat; NIST–OSAC Seized Drugs Subcommittee - Chair

Marijuana Concentrates: Safety, Synthesis Extraction and Analysis

Instructor: David Koppenhaver

Monday September 18th – ½ Day Afternoon in **Taft II**

Fee = \$125

Abstract:

In Canada, the first reported “butane honey oil” lab was discovered in 2008. For the past six years in North America, marijuana extraction laboratories using butane have become one of the newest, fastest growing threats to the public, first responders, and clandestine laboratory responding personnel. This threat is due to the ease of extracting THC and the highly flammable nature of butane. This workshop will review marijuana chemistry, the synthesis and extraction of marijuana concentrates as well as the safety and hazards associated with scene response and the possible hazards from case samples. Furthermore, new trends in marijuana extractions will be covered such as the super critical fluid extraction and the closed loop system. Additionally, qualitative and quantitative results from a butane honey oil extraction experiment will be discussed and extraction techniques from edibles.

Bio:

David Koppenhaver started his forensic science career with the Indiana State Police laboratory system in Fort Wayne. During the early years of the meth epidemic while working for ISP, he helped establish the Northern Meth Response Team. He has processed 200 meth labs and trained over 3000 police, fire and EMS personnel on the dangers of clan labs and scene response. Talking with him, he speaks fondly about his eight years of service with the Indiana State Police and regards many of his colleagues and MAFS members as some of the best trained scientists he has had the pleasure to work with.

During an Indiana snowstorm in 2004 he had a revelation that he could do his job in a warmer climate and within a couple weeks he interviewed and obtained a job with the Florida Department of Law Enforcement in Tallahassee. While there he established the Meth Response Team in North Florida and processed 50 clandestine laboratories.

As luck would have it, after seven years with Florida he travelled back to colder climates to Norfolk Virginia where he currently works for the Virginia Department of Forensic Science. He was a MAFS member during his employment with the Indiana State Police and is back as a member since he has been with Virginia. He is a Past President of CLIC, and enjoys doing research and presenting his work when casework permits.

Fentanyl and Fentanyl Analogs

Instructor: Tim McKibben

Tuesday September 19th – Full Day in **Taft I**

Fee = \$250

Abstract:

The fentanyl class of narcotic drugs will be presented including analogs that have been seized as well as those that could be seized in the near future. A thorough understanding of this drug class includes: the history of fentanyl type abuse, legitimate uses for fentanyl and its analogs, an introduction into opioid pharmacology including the use of Naloxone for fentanyl symptom reversal. The synthesis of fentanyl type compounds, potential impurities, and characteristic differences between different analog routes is presented. Analytical issues that may arise during the sample preparation and analysis of certain analogs or intermediates will also be discussed. Interpretation of analytical data to assist attendees with future structural elucidation of unknown fentanyl analogs will be presented during this workshop.

Bio:

Mr. McKibben started his career in the mid 1980's as a synthetic organic chemist synthesizing human antibiotics at Pfizer's Central Research facility in Groton, CT. He continued his chemistry career with jobs in all three levels of government (local - Aurora PD; (state - Colorado Bureau of Investigation); and (federal - DEA's Special Testing and Research laboratory) as a forensic chemist, research chemist, and laboratory agent. His experience has included forensic testimony in two foreign countries, the investigation of foreign and domestic clan labs, the interviewing of many cooks involved in large scale drug production along with crime scene processing of homicides, school shootings, Officer-involved-shootings, etc. He currently focus's his company's efforts on assisting government forensic chemists and investigators with analytical reference materials, consultation, and training.

GC/MS Fundamentals of Troubleshooting and Maintenance and Column Method Development

Instructor: Darrin Smith & Kirk Lokits & Eric Pavlich

Wednesday September 20th – Full Day in **Taft I**

Fee = \$250

Abstract:

The GC and GCMS workshop will be focused on the fundamental instrumental aspects (theory/troubleshooting/maintenance) of GC (Split/Splitless) inlets, FID detectors, as well as MS EI sources, as they all relate specifically to forensic analysis (street drugs, toxicology,

accelerants/fire debris). Theory of GC inlet pneumatics, GC detector operation, and enhancing MSD sensitivity, will be discussed. The attendants would learn to be successful in developing methods, optimizing methods and solving problems using GC/MS using specific examples of analysis. The workshop presentation will be PowerPoint based but will have hands on labs involving split/splitless inlet modules, FID modules, MS EI sources. The workshop will cover an entire day and will also include **68XX/78XX** technology and **Intuvo 9000** technology. The amount of individual hands on participation will depend on the size of the class. (Optimal class size ~20 students)

Bio:

Since 1998, Dr. Darrin Smith has been working with mass spectrometry and related methods that has resulted in multiple peer-reviewed publications, numerous poster/oral presentations, and a book chapter. In Fall 2003, he joined the faculty at Eastern Kentucky University where he predominately teaches analytical chemistry lectures and lab. In addition, Dr. Smith has developed and instructed a mass spectrometry course at ECU that has been taken by chemistry and forensic science majors for the past 13 years. He is currently utilizing mass spectrometry with ambient ionization methods for the qualitative and quantitative analysis for a wide range of samples.

Kirk received his B.S. in Forensic Science and Chemistry under Dr. Robert Fraas from Eastern Kentucky University in 1983 and began working as a Forensic Drug Chemist in the Miami Valley Regional Crime Laboratory in Dayton, Ohio. In 1985 he moved his family to Orlando, Florida where he worked as a Forensic Toxicologist for the Florida Department of Law Enforcement in the Orlando Regional Crime Laboratory. In 1987 Kirk became the Crime Analyst Supervisor in the Pensacola Regional Crime Laboratory and started Toxicology services for the Florida panhandle. In January 1990 Kirk left the forensic realm and began his tenure with Hewlett Packard/Agilent Technologies, working as a Customer Service Engineer (CE) supporting the LC, GC, LCMS, GCMS, and ICPMS products. In 2003, Kirk earned his M.S. in Chemistry from Middle Tennessee State University, under Dr. Gale Clark, working on *Alternative Approaches in the Analysis of Flammable Compounds Using Atomic Emission Detection, SPME, and Fast Chromatography*. In 2005 Kirk left Agilent Technologies to attend the University of Cincinnati and earned his Ph.D. in Analytical Chemistry under Dr. Joseph Caruso, where he worked with *Interfacing Conventional and Capillary LC Flow to Argon Plasma: Developing Elemental Detection for Bio-Analytical Applications*. After receiving his Ph.D., Kirk was employed by the Midwest Research Institute (MRI) in Kansas City, MO where he worked as a Principal Chemist and Sr. Program Manager on Department of Defense projects, staffing, designing, and building remote laboratories for deployments throughout the world which included two deployments to Afghanistan. In 2012 Kirk moved to Charlottesville, VA to manage a new MRI research facility. In April of 2014, Kirk re-joined Agilent Technologies as an Applications Scientist for the GC/MS product lines consisting of single quadrupole, triple quadrupole and time of flight mass spectrometer platforms. When not on the road, Kirk enjoys working on his fruit trees in the mountains of VA and spending time with his 9 kids and 4 grandkids.

Eric is a University of Arkansas graduate where he received his B.S. in Microbiology in 1999. After graduation Eric began his laboratory career working for a division of DSM, in Greenville, NC. conducting monitoring of pharmaceutical manufacturing and water systems. Although primarily working in the microbiology arena, this position exposed in interest in analytical chemistry. Upon leaving DSM, Eric went to work for Bonne Bell cosmetics where a wide variety of analytical methods were explored. He conducted monitoring of microbial activity as well as quality control and testing of the entire manufacturing process from raw goods to final product release. This allowed more experience in conducting GC and HPLC analysis as well as FTIR technique. He even conducted a bit of formulation for cosmetics. Looking to broaden his horizons, Eric moved on to Advanced Elastomer Systems where some of the many responsibilities were conducting testing on thermoplastic elastomers in competitive analysis as well as research and development. Some of the techniques employed were rheological testing, physical property analysis, FT-IR, HPLC, and thermal analysis. Finally, in 2003 Eric moved out of the lab into sales with Varian, Inc. During this time his responsibilities were sales of consumable products for GC, HPLC and Sample Preparation. In 2006, Eric's responsibilities moved into capital equipment selling GC, GC-MS, HPLC, UV-Vis, FT-IR and micro GC instruments. In 2010 Agilent Technologies acquired Varian, Inc. and his new role became Application Scientist for GC Chemistries and Supplies which is what he has held for the last seven years. When not visiting customers, Eric can often be found at Walt Disney World as he lives in the Tampa, FL area or working in his driveway on his Jeep.

Toxicology

LC/MS/MS in Drugs and Toxicology Analysis

Instructor: Phil Martin

Monday September 18th – Full Day in **Garfield**

Fee = \$250

Abstract:

Technology and techniques for toxicology and forensics are constantly evolving. The workshop will include a comprehensive overview of challenges and solutions for toxicologists, including:

- Comparison of GC-MS and LC-MS/MS
- Sample Preparation
- Column Technology
- LCMS Method Development and Optimization
- Data Analysis
- LIS/LIMS Connectivity

This workshop is for toxicologists and drug chemists interested in LC-MS/MS analysis. Learn why LC-MS/MS is replacing GC-MS because of improved sensitivity, speed, and ability to

detect a wider array of drugs and metabolites. Know what to expect from your instrument and how to get the most out of it. Learn what to look for in the purchase of an instrument and why your lab should not be afraid to use, validate and interpret LC-MS/MS technology.

Bio:

Phil Martin is responsible for Shimadzu's LCMS and Life Science Business in the upper Midwest. He has twenty years' experience in analytical instrumentation. Much of the last five years have been focused on clinical LCMS for toxicology and forensics. Mr. Martin will be joined by a team of industry experts, including:

- o Dr. Andrea Terrell – Founder of Phoenix Labs and former director of AIT Laboratories
- o Mr. Greg Ingle – CEO of Clinical Lab Consulting
- o Mr. John Baker – Restek
- o Mr. Murph Hanna – Eppendorf
- o Dr. Rachel Lieberman – Shimadzu

Marijuana Legislation and Challenges in Forensic Toxicology

Instructor: Vanessa Beall

Wednesday September 20th – ½ Day Morning in **Garfield**

Fee = \$125

Abstract:

In November 2000, Amendment 20 was passed in Colorado which legalized limited amounts of medical marijuana for patients and their primary caregivers. In November 2012, Amendment 64 was passed in Colorado which legalized recreational marijuana by decriminalizing the possession of marijuana and regulating the sale of marijuana. On January 1, 2014 recreational marijuana stores opened to the public.

As of November 9, 2016, twenty-eight states and the District of Columbia have legalized marijuana for medical use. Included in these twenty-eight states are eight states and the District of Columbia which have legalized marijuana for recreational use. As states around the country begin to legalize medical and recreational marijuana, it is important for forensic scientists to understand the possible effects of legalization on toxicology analysis and testimony. Workshop attendees can expect to learn the following objectives:

1. An overview of relevant laws in Colorado and other states with legalized medicinal and/or recreational marijuana.
2. An understanding of analytical challenges regarding the analysis of cannabinoids in driving under the influence of drugs (DUID) specimens.
3. How to interpret driving under the influence of marijuana data and potential challenges in testimony.

4. A summary of the evaluation of the presence of Δ^9 -tetrahydrocannabinol, cannabiniol, cannabidiol, 11-hydroxy-THC, and 11-nor-9-carboxy-THC in antemortem DUID cases in Colorado throughout 2016.

Bio:

Vanessa Beall earned her Bachelor of Science in Forensic Science from Eastern Kentucky University in 2006. In 2014, she received a Master of Science in Drug Chemistry from the University of Florida. She has 10 years of toxicology experience specifically in human performance, postmortem, and clinical toxicology. She began her career in Kentucky working for the Kentucky Medical Examiner's Office and the Kentucky State Police Central Forensic Laboratory. She then worked for a private clinical toxicology laboratory in Lexington, Kentucky. In 2013, she moved to Colorado and worked for a private toxicology laboratory before moving over to the Colorado Bureau of Investigation where she currently works as a Forensic Toxicologist. The Colorado Bureau of Investigation offers both antemortem and postmortem services for the state of Colorado.

The Life Cycle of a Toxicology Case

Instructors: Bob Topmiller, Christina Dattilo, Seth Tiger, Adam McMillan

Wednesday September 20th – ½ Day Afternoon in **Garfield**

Fee = \$125

Abstract:

This workshop will take you through the life cycle of a Toxicology case and how all the parts must work together for successful prosecution. You will hear from the officers point of view about what is needed and how he looks at the laboratory. You will hear from the laboratory analysts and what is expected in sample preparation, extraction, confirmation, reporting, and testimony. You will also hear the prosecutor's expectations of all involved in bringing a case to successful prosecution especially what is expected of a toxicologist and impairment testimony. All of these aspects will be presented using a high-profile case in Cincinnati involving the vehicular homicide of a cyclist.

Bio:

Bob Topmiller has been a forensic analyst for 37 years. He started his career as a drug chemist, but for the last 24 years has been a toxicologist. He has been the Chief of Toxicology at the Hamilton County Coroner's Lab since 2011 and offers impairment testimony all over the State of Ohio.

Serology / DNA

Touch and Handler DNA – Approaches, Optimization, and Considerations

Instructor: Jon Millman

Monday September 18th – ½ Day Morning in **Presidential II**

Fee = \$125

Abstract:

Advances in forensic genotyping technologies have enabled forensic scientists to develop DNA profiles from increasingly smaller quantities of DNA, often referred to as “touch” or “handler” DNA. This has facilitated the application of DNA typing to a far wider range of sample types. As a result, scientists have experienced challenges that were not previously encountered in this field, including how to localize and sample these deposits and how to interpret low level profiles. The greatest challenge may be determining the implications of the results in the context of the overall criminal investigation and prosecution; indeed, the very terms “touch” and “handler” DNA may themselves imply inferences regarding activities that may not be appropriate. The instructor will lead workshop attendees through these considerations, focusing on research performed by his group at the Centre of Forensic Sciences and in other laboratories.

Topics covered in this session will include:

1. What samples are best suited for “touch/handler” DNA analysis?
2. Which sampling techniques are best for “touch/handler” DNA analysis?
3. Targeting and identifying areas to sample for “touch/handler” DNA analysis.
4. Low level DNA in sexual assault cases.
5. Approaches taken to analyse low quantities of DNA.
6. What does it all mean? Source level vs. activity level propositions in the context of low levels of DNA

Bio:

Jon Millman is an Assistant Section Head in the Biology Section at the Centre of Forensic Sciences, a forensic laboratory with ~250 staff members serving the province of Ontario.

He obtained his bachelor and doctoral degrees in Biochemistry at McMaster University in Hamilton, Ontario. Jon then accepted a fellowship in the department of Molecular and Medical Genetics at the University of Toronto, where his research focused on the application of functional genomic approaches to identify and characterize genes involved in cancer progression.

Jon joined the CFS as a Biology scientist in 2005 and has been an Assistant Section Head since

2007. Jon is currently responsible for the oversight of violent crime and cold cases, CODIS and the Biology R&D program, the main focus of which in recent years has been touch DNA and the optimization of sexual assault evidence examination and recovery.

Improving Your Testimony Experience for Forensic Biology and DNA Analysis

Instructor: Kara Stefanson

Monday September 18th – ½ Day Afternoon in **Presidential II**

Fee = \$125

Abstract:

The class will involve suggestions for improving interaction between prosecutors and analysts, direct testimony and some tips on how to predict and take charge of cross examination. Approaches for cases involving defense experts will also be discussed.

Students will be encouraged to practice explaining complex topics such as accreditation, quality measures and report wording in addition to preparing specific direct questions to explain incidents or quality issues involved in their cases at a lay person's level.

Examples of court question will be provided along with tips on how to organize questions for cases with multiple items and complicated results.

Bio:

Ms. Stefanson has 12 years of experience in the crime lab setting including both bench work and supervising forensic scientists in the area of Forensic Biology and DNA Analysis. She is in her 13th year assisting prosecutors in the Chicago area with DNA related issues, casework results and courtroom testimony. Her ability to bridge the gap between scientists and prosecutors has resulted in successful courtroom testimony in many criminal cases involving biological evidence.

Maximizing Your Casework Results with the Proven Performance of Capillary Electrophoresis and the Power of Next-Generation Sequencing (NGS)

Instructor: Gabe Feltner, William Frank, Jennifer Churchill, Angie Lackey

Abstract:

Analyses of Short Tandem Repeats (STRs) through Capillary Electrophoresis (CE) technologies are the traditional gold standard for forensics. However, with increasing global diversity, there is a demand for forensic applications that supply information for challenging sample types. For casework samples such as ancient remains, touch (low DNA copy number), mass disaster victims, and sexual assault cases, more information is needed for accurate human identification. The Precision ID GlobalFiler NGS STR Panel has been optimized for NGS and detects STR sequence polymorphisms, thus increasing the discrimination potential of the widely used markers. Additional polymorphic STRs with sequence-based alleles, that can only be observed through sequencing have been included. Additionally, recent studies have demonstrated the use of Next Generation Sequencing (NGS) to interrogate simple di-allelic Single Nucleotide Polymorphisms (SNPs) as a new method for human identification. Thus, the Precision ID Identity and Ancestry Panels were developed to determine random match probabilities and infer biogeographical ancestries, respectively. To innovate further, a set of microhaplotypes¹ (μ Haps) is currently being investigated to determine the number of contributors within a mixture sample, and potentially ancestry information. Microhaplotypes are loci of 3-7 SNPs that are in close genetic proximity, but are far enough to not be considered as Multi-Nucleotide Polymorphisms (MNPs). Microhaplotypes are multi-allelic in phase and have the low recombination rate of SNPs rather than the higher rate observed in STRs. Lastly, a Whole Mitochondrial (WG) Genome and Control Region (CR) Panel was developed to analyze samples where nuclear DNA is far too degraded to be quantified and amplified. The Mito genome is advantageous for determining maternal lineage in forensics, as well as studying metabolomics for the diagnostic and clinical world. The panels can be used individually or in combination and are processed on the Precision ID NGS System for human identification (Ion S5™ System, Ion Chef™ System, and Converge™ Software).

Bio:

William Frank began his career as a Forensic Scientist with the Illinois State Police in 1984. In 1991 the Illinois State Police established an R&D Laboratory to develop a DNA analysis program. Mr. Frank accepted a position as DNA Research Coordinator and has been a part of the ISP R&D Laboratory to date. His validation work on both autosomal STR and Y-STR analysis has been accepted by NDIS to qualify results from DNA assays for inclusion into the national database. Mr Frank has publications which include the Journal of Forensic Sciences, FSI-Genetics, the American Journal of Human Genetics and Genetics in Medicine.

Jennifer Churchill is a Postdoctoral Research Associate in Dr. Bruce Budowle's lab at UNT Health Science Center's Center for Human Identification. Jennifer received her Bachelor of Science degree in Biochemistry from Texas A&M University. Her undergraduate research at Texas A&M involved the application of molecular genetic technologies to the study of population and conservation genetics of the North American bison. Jennifer earned her Ph.D. in Biomedical Sciences specializing in Human and Molecular Genetics at the University of Texas

Graduate School of Biomedical Sciences. Her dissertation work focused predominantly on the use of linkage and next-generation sequencing technologies to identify novel autosomal dominant Retinitis Pigmentosa genes. As a postdoctoral research associate, Jennifer's current research includes the forensic development and application of human identification genetic marker analyses with massively parallel sequencing technologies.

Angie Lackey is the Global Market Development Manager for next-generation sequencing in forensic applications for Thermo Fisher Scientific. Her experience in forensic DNA analysis includes working with crime laboratories in California to transition from RFLP and dot blot technology to capillary electrophoresis of STR markers. Having spent nearly 10 years working with the development of next-generation sequencing applications, she is now working with crime labs world-wide to apply MPS to forensic samples and workflows. Ms. Lackey holds a bachelor's degree in chemistry from the University of North Carolina Chapel Hill.

DNA Quality Assurance

Instructor: Carl Sobieralski, Jocelyn Carlson

Tuesday September 19th – ½ Day Afternoon in **Presidential II**

Fee = \$125

Abstract:

The Scientific Working Group on DNA Analysis Methods (SWGDM) is revising and updating the Quality Assurance Standards (QAS) for Forensic DNA Testing Laboratories and the Quality Assurance Standards for DNA Databasing Laboratories. Upon completion, SWGDAM will recommend the QAS revisions to the Director of the Federal Bureau of Investigation for issuance. Ms. Jocelyn Carlson will discuss the revision process, the current proposed revisions under consideration for incorporation, and the anticipated timeline for approval. This information is being provided with the aim of offering insight into the proposed new standards in order for laboratories to initiate the preparations that may be needed to achieve compliance. The Organization of Scientific Area Committees (OSAC) is actively developing standards for the forensic community. This presentation will focus on the standards and guidelines being developed by the biological subcommittees. The standards development process will be discussed and how that is expected to impact the accreditation process.

Bio:

Ms. Jocelyn Carlson serves as the chair of the Scientific Working Group on DNA Analysis Methods (SWGDM) Quality Assurance (QA) Committee. Ms. Carlson has participated in SWGDAM and has acted as the QA Committee chair for the last 3 years. During this time, SWGDAM has tasked the QA committee with updating the Quality Assurance Standards for

Forensic DNA Testing Laboratories and DNA Databasing Laboratories. Currently, Ms. Carlson manages the DNA Quality Assurance Program for the FBI Laboratory which supports both DNA casework and databasing operations. Ms. Carlson has been with the FBI Laboratory for the last 7 years where she was qualified as a Forensic Examiner in Serology and Nuclear DNA testing. Ms. Carlson has over 13 years of experience working in the forensic DNA field.

Carl Sobieralski has been in forensics for over 25 years. He is an original member of the Indiana State Police DNA unit. He is the Biology Section Technical Leader for the Indiana State Police Laboratory system. He is a contract lead assessor for ANAB. He is a current member of the Organization of Scientific Area Committees (OSAC) Data and Interpretation and Reporting subcommittee which works to develop standards for the forensic community.

Forensic DNA Rescue Class

Hands-on Workshop: New Forensic DNA Methods

Body Fluid Identification & Sperm Identification

and Update on Sperm Isolation Techniques

Instructors: Dina Mattes, Karl Reich, Jennifer Old

Wednesday September 20th – ½ Day Morning in **Presidential II**

Fee = \$125

Abstract:

Rescue your DNA

The class will concentrate on better DNA evidence collection techniques and new DNA purification options to minimize loss of DNA from low copy number touch samples, fingerprints, adhesive evidence and LCM dissected sperm. --*Hands-on with adhesive evidence samples: tape lifts, hinge cards, electrical tape, duct tape, etc.*

Rescue your Profile

Attendees will learn post PCR clean up and concentration techniques to rescue their amplicons when they have partial profiles from inhibited, degraded, or very low template samples. Improved analysis for low level, minor contributors (using variable amounts of the PCR reaction for post PCR processing). --*Hands-on performing post PCR clean up with full, half and ¼ size reactions*

Rescue your Sperm DNA

Faster sperm detection, new microscope equipment & imaging options, quicker staining, increased signal to noise, cell sorting technology for sperm isolation (coming soon). *Hands-on staining and viewing on optimized microscope.*

Rescue your Time

New 10 second extractions for detecting saliva and semen, comparison AP, P30, RSID SEMEN, analyzing & documenting results using RSID READER. – *Hands on body fluid identification using 10 sec. protocol. Participants will run tests and perform analysis and documentation using handheld READER.*

Bio:

Karl Reich received his undergraduate degree in Chemistry from Cornell University and worked as a chemist before obtaining his doctorate in Molecular Biology from UCLA [through a quirk, his graduate research was performed at Harvard Medical School]. Dr. Reich's postdoctoral training included research work at the Institut Pasteur, Paris France and at Stanford Medical School. He then spent five years in the Pharmaceutical Division of Abbott Laboratories working on a variety of DNA-based genomic projects. He is presently the Chief Scientific Officer at IFI where he oversees the laboratory and directs the research and development efforts of an ISO-17025 accredited forensic DNA laboratory.

Dr. Reich has more than 30 years of scientific experience in chemistry, molecular biology and biochemistry. He has published more than 20 research papers in first line scientific journals and has been court qualified in DNA, Biology and Statistics in numerous jurisdictions.

Jennifer Old received her undergraduate degree from Creighton University in Omaha, Nebraska and completed her graduate work in Pathology/Microbiology at the Eppley Cancer Institute at the University of Nebraska Medical Center. Jennifer completed a 3 year post-doctoral fellowship at St. Jude Children's Research Hospital in the lab of John Cleveland working on mouse tumor models. Presently, Dr. Old is a senior research and development scientist at Independent Forensics and was the primary researcher in the RSID™ (**R**apid **S**tain **I**dentification) Series of Body Fluid Identification tests for the detection of body fluids at crime scenes and Sperm Hy-liter, the immunofluorescent based method for sperm identification. Jennifer Old has published 15 articles in peer-reviewed journals and has over 15 years in laboratory experience in molecular biology, fluorescent microscopy, and biochemistry.

Dina Mattes has more than twenty years experience in microscopy and image analysis. Her professional career includes significant time at McCrone Microscopes, before joining Independent Forensics. She is responsible for the SPERM HY-LITER microscope systems and has taught numerous workshops on an extensive array of optical techniques.

Familial DNA Analysis

Instructors: Kristin Schelling & Rock Harmon

Wednesday September 20th – ½ Day Afternoon in **Presidential II**

Fee = \$125

Abstract:

This presentation will discuss the scientific, legal, and policy issues that accompany discussions about using familial DNA searching to solve unsolved crimes. The scientific part entails a brief discussion of the use of specialized software to establish a candidate list, followed by lineage testing to confirm/refute close relatedness. The legal discussion will include a review of states' current DNA database laws and a demonstration of how they all implicitly authorize familial DNA searching, eliminating the need for explicit legislative authorization. Finally the discussion will address policy implications, showing the need to balance public safety versus privacy, and how this issues are easily addressed by current states' familial DNA searching protocols. Sadly, few states (10) currently use FS. In the other states there has been little or no public discussion on the pros and cons of implementing FS. Recently it has taken specific, publicized unsolved cases where the discussion has been initiated by victim's family to have open discussions.

This presentation will present and discuss subjects that can be utilized by law enforcement and state labs to initiate the conversations themselves. Included in the topics are discussing the number and kinds of cases with DNA profiles in SDIS, encouraging law enforcement to support efforts, finding family members who will support FS.

Bio:

Rockne P. Harmon is currently employed as a consultant to numerous law enforcement agencies dealing with such issues as cold case investigation and other issues related to forensic DNA typing. He had been an Instructor at U.C. Davis in the Masters in Forensic Science program from 2007-2015. He retired in 2007 after a 33 year career as a Senior Deputy District Attorney for Alameda County, California.

He graduated from the United States Naval Academy in 1967 and served four years active duty. He served a combat tour in Vietnam as Officer in Charge of a Navy Swift Boat and received the Purple Heart for wounds received in combat. After his military service he attended the University of San Francisco School of Law and graduated in 1974. He is a Fellow of the American Academy of Forensic Sciences.

He was the prosecutor in a triple murder case that established the general acceptance of conventional serological methods, the precursor to today's DNA technology.(People v. Lawrence Reilly). As a result of that case he was in a position to assist the forensic science community as it began the implementation of DNA typing soon thereafter.

He has written and lectured extensively on the subject of the admissibility of forensic evidence, particularly DNA evidence. In 1998 he received an award from the FBI Director for his efforts supporting the FBI in their first decade of DNA typing. In 2003 he received the Achievement Award from the International Homicide Investigators' Association for his work on cold cases.

He was the Chairman of the California District Attorneys' Association Forensic Science Committee and was on the Advisory Board to the International Homicide Investigators' Association for many years. At Alameda County he developed a highly successful protocol for solving old or unsolved cases using DNA typing. He was the driving force behind the California Attorney General's decision to implement familial DNA searching in California that led to the arrest of the "Grim Sleeper" serial killer in 2010.

He was one of the prosecutors in People v. O. J. Simpson.

Kristin Schelling is the Biology/DNA Technical Leader for the Michigan State Police. During her career in forensic biology she has worked for the Michigan State Police and the New York State Police. Her assignments have ranged from data basing operations, mass disaster identifications, biology and DNA casework, supervisory responsibilities in charge of training new staff and managing a biology unit, and most recently, technical leader duties.

Firearms

Glock Armorer Course

Instructor: Lynn Freshly

Tuesday September 19th – Full Day in **Garfield**

Fee = \$300

Abstract:

Learn how to safely use and maintain your weapon in a one day (8 hour) class.

(To be eligible to take the Armorer's Course you must be an active/retired law enforcement or military officer, private security, GLOCK Stocking Dealer/Range Program Employee or current GSSF member.)

Bio:

Lynn has been working in Law Enforcement for over 30 years and recently retired from the Barberton, Ohio Police Department after 27 ½ years. He retired with the rank of Lieutenant and he still holds a reserve commission with Barberton. While with BPD, Lynn was a Patrol Officer, Detective, SWAT Team Member, Patrol Supervisor, Shift Commander, Patrol Commander and SWAT Commander. He was Acting Chief for Barberton when the Police Chief was on extended sick leave.

Lynn has been a firearms instructor since 1987 and is certified by the Ohio Peace Officers Training Counsel to teach semi-auto pistol, revolver, shotgun, Sub-machinegun, tactical assault rifle/carbine and scope sighted rifle. He is also an NRA certified instructor for pistol, rifle,

shotgun, home safety and personal protection. He has attended armorer course from Glock, Colt, Smith & Wesson, Heckler & Koch, Remington, Beretta and Sig Sauer. Lynn has attended over 85 training schools related to firearms and SWAT. Courses include; FBI Basic and Advanced Scout/Sniper, USMC Scout/Sniper, US Army Special Forces 3rd Group Marksmanship, Rob Leatham and Jerry Barnhart.

Since 1998, Lynn has been an adjunct instructor at the Tactical Defense Institute in Southern Ohio. At TDI, Lynn teaches handgun, tactical rifle, precision rifle and building search tactics. He has also taught over 1000 students in classes for the Ohio Concealed Carry.

Lynn is a member of the NRA, National Tactical Officers Association, Ohio Tactical Officers Association, GSSF and the Fraternal Order of Police.

General

Public Speaking /Media Training

Instructor: Hugh Malay

Monday September 18th – Full Day in [McKinley I & II](#)

Fee = \$250

Abstract:

Part #1

General overview/lecture presenting components of successful public speaking. Will watch historical file video of effective speakers. We'll also present NOT so successful public speakers, Q & A if time permits.

a. PRESENTATION SKILLS

Polish your public speaking skills, define audience/purpose and conquer fear with on-camera feedback and constructive critique of both content and style. Each attendee will record a two-minute video interview. Due to time constraints, additional comments and constructive recommendations will be emailed to attendee.

Additional areas of focus: Getting "comfortable", slowing down the process

b. 5 P's-Prior Preparation Prevents Poor Performance

Great public speakers never "wing it". Whether it's a courtroom examination, deposition, media interview or a public speaking engagement, take the time to practice & prepare.

Area of focus: Formulating a mental game plan for specific situations.

c. ACCENT REDUCTION/Content Delivery

Enhance your use of the English language to be more clearly understood. Articulate, announce and punctuate.

Additional areas of focus: Intonation, pauses, pace and projection.

d. Visuals/IMAGE

Help individuals develop a comfortable/credible personal style. From posture to personal appearance (hair/make-up/wardrobe)

Area of focus: Visual credibility.

Part #2

LIVE ONE-on-ONE INTERVIEWS

I pose a series of questions to each individual attendee, which we record. This Q&A is followed by a quick critique. Additional comments will be emailed to attendee.

Bio:

H. K. Malay is executive producer of Monarch TV- Productions, a full- service video production and media placement company located in Southern California. Monarch has been in business since 1995 and produces tv & radio commercials and online digital content.

H K graduated from Ohio State in 1981 with a degree in broadcast journalism. Before starting Monarch, he worked as a radio and tv-sportscaster/producer with FNN/SPORTS, SportsChannel, ESPN, SKY SPORTS and Prime Ticket.

H K is a frequent lecturer to LA area high schools emphasizing effective verbal and non-verbal communication skills.

"Whether you're speaking to 5 people or 500, succinctly articulating a person's thoughts in a public forum isn't a skill that comes naturally," H K says. "It's critical people clear out the noise, define the audience, so they deliver a clear, concise message."

Expert Witness Testimony Training for Forensic Scientists: How to Hit this Ever-Moving Target!

Instructor: Ron Smith

Tuesday September 19th – Full Day in [McKinley I & II](#)

Fee = \$250

Abstract:

Contrary to the public's perception, the majority of crime laboratories and forensic units do not have a formal and comprehensive expert witness testimony training program. This leaves the newly trained forensic examiner in the precarious position of learning to testify by attending the "School of Hard Knocks". Compound this lack of standardized training with the challenges to the forensic sciences since the "Daubert" decision and the NAS report and the courtroom environment becomes a potential mine field for the unprepared expert witness.

Add to that the upcoming recommendations of the National Commission on Forensic Science regarding terms to be used or not used in testimony and we find ourselves in the position to rethink how we testify and how we teach our trainees to succeed on the witness stand.

This one day workshop will focus on one basic premise, and that is: Jurors do not vote on the truth! They can only vote on their perception of the truth as they see it that day in court. It certainly is not our job as expert witnesses to convict, but it is incumbent upon us to testify in a manner which is believable and understandable, regardless of the verdict.

It is up to you, as an unbiased forensic expert witness, to instill within them what is termed "forensic trust". Trust of the forensic discipline you practice and trust in you as the practitioner. This workshop is designed to teach the student the methodology necessary to foster that level of trust, regardless of the challenges presented by legal counsel. This workshop is a fun, interactive and highly energetic. Those faint of heart need not attend!

Bio:

Ron Smith is President of "Ron Smith & Associates, Inc.", a forensic identification services corporation headquartered in Collinsville, Mississippi. RS&A has two ISO 17025 and 17020 accredited laboratory facilities located in Mississippi and in Florida. In 2015, RS&A also gained ISO 17043 accreditation as an approved Proficiency Test Provider in both Latent Prints, Ten Prints, Footwear and Tire Track and in 2017 will be expanding that scope to include Latent Print Processing.

Ron began his career with the Federal Bureau of Investigation in 1972, moving on to the Alabama Bureau of Investigation and from 1978 to 2002 with the Mississippi Crime Laboratory, retiring as Associate Director.

He has over forty years of experience in latent print, crime scene and laboratory management practices and has been certified by the I.A.I. as a latent print examiner and senior crime scene analyst. In July of 2001, he was awarded the "John A. Dondero Memorial Award", which is the highest award bestowed by the International Association for Identification for exemplary contributions to the science of forensic identification.

Ron has lectured on courtroom testimony techniques, latent print examinations and crime scene related topics in forty-seven states within the U.S. and numerous other countries around the world.

Cognitive Bias

Instructor: Erin Morris

Monday September 18th – ½ Day Morning in Taft II

Fee = \$125

Abstract:

Cognitive bias is a universal and unconscious phenomenon, whereby contextual information, expectations, motivations, and the like can distort perception and decision-making. Understanding the types and sources of bias and learning how to limit their influence is important for improving the reliability and accuracy of decisions made by forensic experts. This workshop will introduce attendees to psychological research studies and real-life case histories that illustrate how bias can sway the perceptual and cognitive judgments of forensic examiners and produce faulty conclusions, without malicious intent or even conscious awareness. Attendees will learn about factors that increase the risk of bias affecting the interpretation of forensic evidence, as well as practices that may be implemented (or avoided) in order to prevent or minimize its effect.

Bio:

Erin Morris is a Research Analyst with the Los Angeles County Public Defender's Office. She received her Ph.D. in Psychology and Social Behavior from the University of California, Irvine. Her doctoral training was in cognitive psychology, social psychology, and psychology & law, and her empirical research focused on memory distortion, jury decision-making, and scientific evidence. At the Public Defender's Office, she supports criminal defense litigation in capital and non-capital cases by helping attorneys understand and evaluate forensic science, social science, and expert evidence. Dr. Morris has written about cognitive bias in forensic science and presented on topics relating to bias, scientific evidence, and case preparation around the country. In 2014, she was appointed to the Human Factors Committee of the National Institute of Standards and Technology's Organization for Scientific Area Committees (OSAC), which provides guidance on minimizing cognitive bias and mitigating errors in forensic science.

Leadership Development Symposium: Communication

Communication Instructor: Brian Hoey

Wednesday September 20th – Full Day in [McKinley I & II](#)

Fee = \$250

Abstract:

George Bernard Shaw once said, "The single biggest problem in communication is the illusion that it has taken place." This symposium-style workshop will feature speakers that have successfully completed the spring Leadership Development Communication webinar. Brian Hoey will moderate by bringing together different concepts within the scope of communicating in the workplace. This workshop is not only for those pursuing management roles in the workplace, but for the bench analyst and those new to the Leadership Development series, as well. A series of sub-topics will be presented by different speakers all correlating to the main communication theme; including the individual system, influencing, culture, crucial conversations and accountability.

Bio:

Brian Hoey is a twenty-four-year veteran of the Missouri State Highway Patrol Crime Laboratory. Brian worked much of his career as a DNA analyst and served as the DNA technical Leader for 8 years. Brian is currently an Assistant Director of the laboratory.

Brian holds a Bachelors and Masters degree in Biology from Northern Illinois University. as well as an MBA from William Woods University. Brian is an adjunct instructor at Columbia College in Columbia, Missouri teaching courses in Anatomy, Physiology and Criminalistics.

Brian served as a Member of the Scientific Working Group on DNA Analysis Methods (SWGDM) for 8 years as well as served on it's on the Executive Board for 3 years. Brian is a Member of the Midwestern Association of Forensic Scientists where he served for five years as the Biology Coordinator, served as the Program Chair for the 34th annual meeting, served on the Board of Directors as the Treasurer for three years (2008-2011) and President (2013). Brian was awarded MAFS Outstanding Scientist in 2016. Brian has given several papers taught a number of workshops at MAFS meetings, most recently having coordinated and presented in the MAFS leadership and Management series.

Crime Scene

The Science Behind Officer Involved Shootings (OIS) & Specialized Photography for Injuries and Sexual Assaults

Instructors: Andrea Reed & Ashley Hoffmeier

Monday September 19th – Full Day [in Hayse](#)

Fee = \$250

Abstract:

This workshop will give attendees an overview of what happens when a law enforcement officer is involved in a shooting from the perspective of a crime scene investigator. Crime scene investigators are not participating in the investigation to assign guilt or to decide if it was a good shoot or not. Aspects of general crime scene considerations will be discussed to include, but not limited to: what to expect when multiple agencies are involved, media coverage, general components of an Officer Involved Shooting Team, gaining familiarity with the types of force used by the agencies you will be involved with, the different types of evidence encountered at an officer involved shooting crime scene, and processing considerations when dealing with involved officers. A brief introduction to shooting incident reconstruction along with case reviews will be presented.

This workshop will explore injury documentation using UV/IR technology and Forensic Light Source examination and photography. We will discuss current tools on the market that can be used to document injuries as well as patterned injuries and bite marks. We will also cover documentation and development of fingerprints on human skin.

Bio:

Andrea is the Supervisor of the Crime Scene Investigation Unit with the Johnson County, Kansas Sheriff's Office Criminalistics Laboratory. She has been with Johnson County almost five years and prior to Johnson County, she was employed with the Kansas City, Missouri Police Department Regional Crime Laboratory in the Crime Scene Investigation Unit. Combined, she has almost 12 years of experience with crime scene processing. Andrea has a Master's of Science in Forensic Science and also three Bachelor of Science degrees (Biology, Forensic Science, and Criminal Justice). She is a Certified Senior Crime Scene Analyst with the International Association for Identification. Over her career she has worked hundreds of shooting scenes, many of which involved law enforcement officers and shooting incident reconstruction.

Ashley Hoffmeier works as a Crime Scene Investigator for the Johnson County Sheriff's Office in Olathe Kansas. Prior to that she worked as a Crime Scene Investigator for the Kansas City Missouri Police Department and has 10.5 years of experience combined between the two agencies. She has a Bachelor's of Science Degree in Forensic Science with a minor in biology and is certified through the International Association for Identification as a Level III Senior Crime Scene Analyst. A majority of her research and experimentation has been on injury documentation using UV/IR and Forensic Light Source technology and photography, fingerprint development on human skin, and sexual assault investigations.

"Crime Scene Documentation - Sketching, Diagramming, and Laser Scanning"

Instructor: Ryan Rezzelle

Tuesday September 18th – Full Day in Hayse

Abstract:

Over the past 20 years, we have seen technology help lift the crime scene diagram off of the printed page and straight into the 3-D, 21st century. Crime scene surveying and forensic mapping methods typically start in the realm of hand drawn sketches and hand recorded measurements and range up through 3-D point clouds from laser scanners and known scale aerial photos used to convert images into 2-D and 3-D products. The output we create for crime scene mapping can be as simple as a 2-D drawing via computer-aided drawing (CAD) software and from there, the sky is the limit! Elaborate presentations of 3-D data (ex. spatially correct perspective views, one-to-one point clouds, and 3-D "fly-throughs" around a crime scene) can all easily demonstrate dynamic perspectives at a scene. At the very high end, virtual reality and augmented reality methods of viewing scene data are barreling towards us and our methods for presenting crime scenes in the courtroom may drastically change over the next 10 years.

This workshop will cover all of the above and more. The goal will be to convey a takeaway methodology for hand recording information at a crime scene and using hand conversions to create a scale hand drawing of a scene. This basic technique establishes a baseline understanding of scale and perspective in forensic mapping and it will be the foundation for the presentation of the more complex scene methods during the workshop. A wide variety of measurement methods will be demonstrated and used in exercises from historic techniques through the most modern. The range of electronic data collection methods will be discussed (handheld lasers, total stations, GPS, drones, and laser scanners) and the 3-D laser scanner will be demonstrated from initial use at a scene through the completion of a diagram and creation of a range of 3-D output forms.

Bio:

Ryan M. Rezzelle recently concluded 15+ years as a Crime Scene Investigator including half that time as the Supervisor of the Crime Scene Investigation Section for the Johnson County (KS) Sheriff's Office Criminalistics Laboratory and first half of his career with the Kansas City Police Department (MO). Ryan was a part of the accreditation team in both laboratories that brought the CSI Section under the laboratory accreditation, most recently in Johnson County to the ISO standard. He holds a Master of Forensic Sciences degree from The George Washington University and two B.A. degrees from the University of Maryland. He holds Level III certification as a Senior Crime Scene Analyst from the IAI and is an active member of a wide variety of professional organizations. He is a member of the NIST OSAC Sub-Committee for Crime Scene Investigation. Ryan appreciates the opportunity to serve our community and he is committed to making our world a safer place. Ryan currently works as the Sales Manager for the US & Canada for Leica Geosystems Public Safety Group in which he is also the Account Manager for the Midwest Region. In his current role, Ryan specializes on developing and delivering

solutions for mapping crime scenes from handheld measuring devices up through cutting-edge 3-D laser scanner solutions.

Question Documents

Fee = \$575 for entire QD Book

Covert Communications and Concealment Techniques

Instructor: Peter Belcastro & Gregg Moczycki

Monday September 18th – ½ Day Morning in [Harrison](#)

Fee = \$200

Abstract:

This presentation will discuss various types/methods of concealed communications and the role they play in criminal and intelligence investigations. Focus will be placed on the detection, development, preservation, and demonstration of various types of covert communications that have been encountered in actual questioned document case scenarios. Equipment, chemicals, and other tools utilized during the examination of such cases will be discussed as well as various "offensive forensic techniques" that can be utilized in these types of investigations. Particular attention will be paid to techniques utilized by prisoners to communicate and transmit information secretly; including ways prisoners create and utilize concealments. Hands-on exercises will be conducted concerning the creation of various types of concealment tradecraft and the detection of these items.

Bio:

Mr. Belcastro has been employed with the Federal Bureau of Investigation for approximately 25 years. He was certified by the FBI Laboratory in 1997 and has been assigned to the Questioned Documents Unit (QDU) since that time. Mr. Belcastro has been conducting forensic casework in the field of questioned documents for approximately 18 years and has testified to his results in various federal and state courts as well as administrative and pre-trial hearings. In addition to conducting forensic examinations, he is currently the Training Program Manager for the QDU and is responsible for the internal training of FBI document examiner trainees as well as any external questioned document training of laboratory and other law enforcement personnel. Mr. Belcastro earned a Bachelor of Science degree from the University of Maryland in general biological sciences with an emphasis in microbiology and carries a Master of Forensic Sciences degree from The George Washington University. Mr. Belcastro is currently a distinguished member of the Mid-Atlantic Association of Forensic Scientists (MAAFS).

Mr. Mokrzycki earned his Bachelor's Degree from Johns Hopkins University and a Master's Degree in Forensic Science from George Washington University. Since 1997, Mr. Mokrzycki has worked in the Federal Bureau of Investigation's Questioned Documents Unit. Upon completing certification in 2000, Mr. Mokrzycki became a Forensic Document Examiner, responsible for examining documentary evidence in cases involving criminal and intelligence matters and for testifying in federal, state, and local court in support of his findings. Mr. Mokrzycki manages the FBI's Matchmaker Shredded Paper Reconstruction Program and is currently a distinguished member of the Mid-Atlantic Association of Forensic Scientists, serving as the president of the organization from 2009-2010.

Forensic Science Research: How to Make Your Proposals **Competitive**

Instructor: Gerry LaPorte

Monday September 18th – ½ Day Afternoon in [Harrison](#)

Fee = \$200

Abstract:

Scientific research is often characterized as basic or applied. Basic research is defined as a systematic study directed toward fuller knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications towards processes or products in mind¹; applied research is defined as a systematic study to gain knowledge or understanding necessary to determine the means by which a recognized and specific need may be met. As well, "Development" is often associated with research, but is not commonly recognized as a separate function, which is the application of knowledge or understanding, directed toward the production of useful materials, devices, and systems or methods, including design, development, and improvement of prototypes and new processes to meet specific requirements. Undoubtedly, rigorous research and development is the cornerstone of accurate, reliable, and valid methods used in forensic science laboratories. However, gaps can exist when research involving forensic science - an application of various sciences to address matters of law - does not include a rigorous research design or consideration of practical limitations and applicability. Practical casework in the forensic sciences varies from structured research in a controlled environment, but the need to understand limitations with respect to interpreting data from any forensic analysis is critically important to ensure forensic scientists are communicating their findings and conclusions unambiguously. This can be a challenge when proposing research and applying for grant funding. This workshop is intended to be interactive to share ideas about creating research partnerships, strengthening a research grant application, involving student researchers, and considering research and development that can be integrated into an operational laboratory without a significant disruption to casework.

¹ Definition is taken from: OMB Circular A-11, Preparation, Submission, and Execution of the Budget, Section 84—Character Classification (Schedule C).

Bio:

Mr. LaPorte serves as the Director in the Office of Investigative and Forensic Sciences at the National Institute of Justice (NIJ), where their mission is to improve the quality and practice of forensic science through innovative solutions that support research, development, technology, evaluation, and information exchange for the criminal justice community. His primary duties are to oversee the management of over \$400 million in grants and to provide expert analysis and advice on agency-wide programs or issues of national impact relating to forensic science.

Mr. LaPorte received his Bachelor of Science and Business Administration degrees from the University of Windsor (Canada) and Master of Science in Forensic Science from the University of Alabama at Birmingham. Over the course of his 23 year career, he has worked in various capacities as a forensic scientist. Prior to joining NIJ, Mr. LaPorte was the Chief Research Forensic Chemist for the United States Secret Service.

Mr. LaPorte has over 20 publications, including chapters in three text books, and has presented over 100 lectures and workshops in 13 different countries. He is a member of various organizations including the American Academy of Forensic Sciences, Mid-Atlantic Association of Forensic Scientists, American Society of Questioned Document Examiners, and the American Bar Association. Mr. LaPorte served as the co-chair for the Standards Practices and Protocols Interagency Working Group under the Executive Office of the President of the United States and currently serves on the National Commission on Forensic Science.

Examining Documents Requiring a Multi-Faceted Approach

Instructor: Todd Welch

Tuesday September 19th – Full Day in [Harrison](#)

Fee = \$200

Abstract:

This workshop will focus on disputed documents that by their nature or components are complex and require a combination of examination techniques. The evidence derived from microscopic, infra-red, indentation and other testing will be considered in the context of questions raised about a document's integrity and authenticity. There will be a lecture format followed by hands-on analysis of various single and multi-page documents; working within groups. Equipment will be available for use by the participants. An open discussion of the results will conclude the session.

Bio:

D/Sgt. Todd W. Welch is a Forensic Document Examiner with the Michigan State Police and also works in the private sector with Riley, Welch LaPorte & Associates Forensic Laboratories, Inc. D/Sgt. Welch completed a 3 year fulltime training program in 1996 with MSP and has

worked in the Questioned Document Unit for over 24 years and the Trace Unit for just over 4 years.

D/Sgt. Welch is a Diplomate and holds certification with the American Board of Forensic Document Examiners (ABFDE). D/Sgt. Welch has been a longstanding member of the Midwestern Association of Forensic Scientists (MAFS) which is the largest and most active regional forensic science organization in the country, and was elected as their 40th President. He is currently a member of the Questioned Document Section of the American Academy of Forensic Sciences (AAFS), the American Society of Questioned Document Examiners (ASQDE), the Canadian Society of Forensic Science (CSFS), the International Association of Identification (IAI), and the American Society for Testing and Materials (ASTM). Currently, D/Sgt. Welch serves on the Board of Directors for the (ABFDE), the Executive Committee as Secretary of the (ASQDE), and on the National Institute of Justice (NIJ) Forensic Science Technology Working Group.

Deciphering Complex Impressions with Adobe Photoshop

Instructor: Mark Goff

Wednesday September 20th – ½ Day Morning in [Harrison](#)

Fee = \$200

Abstract:

This workshop expands on previous methods of tracking sourced impressions and imaging techniques to easily track and account for impressions recovered in documents. Early techniques of removing interfering images from EDD lifts, such as embossed writing or impressions sourced to available writing, required complex photography to subtract these interfering impressions. A subsequent technique involved the creation of multiple transparencies to create overlays. These overlays were then stacked on top of each other to account for sourced impressions and interfering embossed writing. While both methods are effective, they can be resource and labor intensive.

This workshop will demonstrate a modern approach to the transparency method for tracking sourced impressions using Adobe Photoshop layers. The presenter will demonstrate how creating layer masks of available writing can be used to account for impressions from multiple documents, show their orientation when created, and reveal unsourced impressions in complex documents. This is especially helpful with notebooks containing impressions from multiple preceding pages but can also be used to differentiate embossed writing from writing impressions, and separate “layers” of impressions in the same document. Additionally, this method can also be very helpful when trying to determine if impressions were created contemporaneously. The final layered image creates a powerful interactive demonstrative product for court testimony.

This workshop is paced to maximize the amount of time spent working with hands on examples to ensure these techniques can be used when the attendee returns to their work site. Graphic step-by-step walkthrough instructions will be provided for future reference. Workshop participants should bring a computer with, Adobe Photoshop CS3, and Bridge CS3 or higher installed in order to complete the hands-on examples, but this is not required for attendance.

Bio:

Enlisted in the Michigan State Police in 1998 and served at 2 posts as an enforcement member until being accepted to the Questioned Document Unit at the Lansing Forensic Laboratory in 2009. He is currently the technical lead for the questioned document discipline and supervisor of the combined Questioned Document/Trace Evidence Unit. He recently retired from the Army Reserve after serving 24 years with 3 deployments. His last position was an assignment to the Michigan State University ROTC program as an Assistant Professor of Military Science. He is a member of the OSAC Forensic Document Examination subcommittee, AAFS Questioned Document Section, a provisional member of AAFS and a member of MAFS where he was the former section chair and the local arrangements chair for the 2015 meeting on Mackinac Island.

He has been a workshop instructor for QD related workshops at AAFS, MAFS and SAFDE.

The Forensic Examination of Original and Copied Signatures

Instructor: Linton Mohammed

Wednesday September 20th – ½ Day Afternoon in [Harrison](#)

Fee = \$200

Abstract:

The examination of signatures comprises much of the caseload of most Forensic Document Examiners. Quite often, the FDE is tasked with comparing signatures that are copies of varying quality. These copies are generally pdf files, fax copies, or photocopies. This workshop will look at what is lost in the various copying processes with different resolutions in comparison with the original signatures. The strength of opinions in cases involving copies will be discussed. Attendees will examine both original and copied versions of signatures, and discuss their observations in groups or individually.

Attendees should bring a hand magnifier with a light source. Low power stereomicroscope(s) may be provided.

Bio:

Dr. Linton Mohammed has been in the field of Forensic Document Examination for more than 30 years. His PhD thesis was entitled "*Elucidating spatial and dynamic features to discriminate between signature disguise and signature forgery behavior.*"

He has testified as an expert witness more than 100 times in the US, England, and the Caribbean. He is the co-author of "*The Neuroscience of Handwriting: Applications for Forensic Document Examination*" and has

published several papers in peer-reviewed journals. Dr. Mohammed has conducted or co-presented workshops on signature and document examination in Australia, Brazil, Canada, China, Latvia, Poland, Turkey, and the United States. In 2012, he was given the **New Horizon Award** in Recognition of Exceptional Contributions in Scientific Research for the Advancement of Forensic Document Examination by the American Board of Forensic Document Examiners, Inc.

Dr. Mohammed is certified by the American Board of Forensic Document Examiners, Inc and hold a Diploma in Document Examination from the Chartered Society of Forensic Sciences.

He is a member and Past-President of the American Society of Questioned Document Examiners, Inc and is currently serving as the Chair of the Questioned Documents Section of the American Academy of Forensic Sciences. He serves on the Editorial Review Boards of the Journal of Forensic Sciences and Journal of the American Society of Questioned Documents and is a guest review for several other journals. He is an appointed member of the Expert Working Group in Human Factors in Forensic Document Examination sponsored by the National Institute of Standards and Technology (NIST). He also served for two years as an appointed member of the Physics/Pattern Evidence Scientific Area Committee of the Organization of Scientific Area Committees (OSAC) sponsored by NIST.

Sincerely,

A handwritten signature in black ink that reads "Michael A. Trimpe". The signature is written in a cursive style with a large initial "M".

Michael A. Trimpe
MAFS 2017 Workshop Coordinator

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