Southern Association of Forensic Scientists/American Society of Trace Evidence Examiners

2015 Joint Meeting

October 12-16, 2015
Atlanta, Georgia
Welcome to Atlanta, Georgia for the Southern Association of Forensic Scientists/American Society of Trace Evidence Examiners 2015 Meeting. We have a full slate of workshops and tours this year that we hope will be beneficial to you.

We hope you enjoy the beautiful Georgian Terrace Hotel. The hotel was built in 1911 and hosted the reception after the world premiere of *Gone with the Wind*. If you have free time during the week, there are plenty of attractions an easy distance by using MARTA just two blocks away. The Georgia Aquarium, World of Coca-Cola, College Football Hall of Fame, Margaret Mitchell House, and Civil Rights Museum, to name a few, are some of the attractions nearby that we hope you get a chance to visit.

If you are not currently a member of SAFS or ASTEE, I encourage you to consider joining one of our fine organizations. For SAFS, this meeting will count as attendance at a meeting. Please stay for the SAFS business meeting to find out more.

If you have any questions or concerns, please let us know! If you have suggestions for future workshops you’d like to see, please let us know!

Your meeting organizers,

Diana Williams – Social Chair
Niki Astor – Program Chair
Larry Peterson – Workshop Chair
Presidents’ Message

Welcome to Atlanta 2015 SAFS/ASTEE Meeting Attendees!

On behalf of the Southern Association of Forensic Scientists and the American Society of Trace Evidence Examiners, we would like to welcome you to the first joint meeting of our associations. It is our hope that through this meeting we can bring two different organizations together with a single goal: strengthening the knowledge and expertise in our forensic disciplines. Forensic science is a constantly evolving and adapting field, with new technologies, novel evidence classes, and new approaches coming to the forefront on a daily basis. It is through meetings like this that we are able to take a break from our busy caseloads and concentrate on developing our skills. By bringing together our two organizations, we would like to foster new professional connections and cross-pollinate ideas to allow for new advancements in our respective disciplines.

Over the course of the week, we’ll host 19 workshops and 7 tours on various areas of forensic science. You can look forward to a keynote address on the Meredith Emerson/Gary Hilton case by the investigators and scientists who worked the case and a presentation on Battlefield Forensics by Christine Swanson and Matthew Soluto of the Defense Forensic Science Center. Participants and presenters have come from across the country and internationally to bring a wide variety of expertise to the table. You will also have an opportunity to network with other professionals at our Gala event on Thursday at the Fabulous Fox Theatre, and that’s an event not to be missed!

In closing, we would like to thank you for attending this joint meeting. You all have valuable knowledge to offer, and we hope this venue provides you with an opportunity to not only grow your skills, but to help other examiners benefit from your experience. We are very excited to have you here, and we hope you enjoy your stay in Georgia’s capitol.

Best,

Jesse Brown
President - SAFS

Jeffrey Dake
President - ASTEE
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Atlanta, GA

Meeting Schedule

Sunday, October 11

Registration  1:00pm to 5:00pm  Business Center
Hospitality Suite  7:30pm to 11:00pm  TBD

Monday, October 12

Registration  7:00am to 5:00pm  Business Center
Structural Elucidation (L)  8:00am to 5:00pm  Mitchell Ballroom
Building Materials (L)  8:00am to 5:00pm  Conference III
Microspectrophotometry (L)  8:00am to 5:00pm  Conference IV
DNA CE Troubleshooting  8:00am to 12:00pm  Conference V
Morning Break  10:00am to 10:30am Lower Breakout
Pressure Sensitive Tape  1:00pm to 5:00pm  Conference V
Grant Writing  1:00 pm to 5:00pm  Conference VI
Afternoon Break  3:00pm to 3:30 pm  Lower Breakout
Hospitality Suite  8:00pm to 11:00pm  TBD

Tours meet in Atrium Lobby
Fiberglass Manufacturing  8:00am to 12:00pm
3SI Security Device Plant  1:00pm to 5:00pm

(L) = Lunch provided in Piedmont Ballroom, RED star

Tuesday, October 13

Registration  7:00am to 5:00pm  Business Center
Vendor Room Open  8:00am to 5:00pm  Conference II
DNA/Trace Working Together (L)  8:00am to 5:00pm  Conference IV
Ethics in Forensic Science  8:00am to 12:00pm  Mitchell Ballroom
GC-MS Instrumental Analysis  8:00am to 12:00pm  Piedmont Ballroom
Physical Fit  8:00am to 12:00pm  Conference III
DART  8:00am to 12:00pm  Conference V
ALS Techniques  8:00am to 10:00am  Conference VI
Morning Break  10:00am to 10:30am Conference II
Courtroom Testimony  1:00pm to 5:00pm  Mitchell Ballroom
GC-MS Novel Psychoactive Drugs  1:00pm to 5:00pm  Piedmont Ballroom
Afternoon Break  3:00pm to 3:30pm  Conference II
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Vendor Reception 5:30pm to 7:00pm  Conference II
Hospitality Suite 8:00pm to 11:00pm  TBD

_Tours Meet in Atrium Lobby_
GBI Lab Tour 8:00am to 12:00pm
Glass Fabrication 1:00pm to 5:00pm

(L) = Lunch provided in the Grand Ballroom, BLUE star

**Wednesday, October 14**

Registration 7:00am to 5:00pm  Business Center
Vendor Room Open 8:00am to 5:00pm  Conference II
Emerging Drugs (L) 8:00am to 5:00pm  Mitchell Ballroom
DNA Interpretation (L) 8:00am to 5:00pm  Conference IV
Cognitive Bias 8:00am to 12:00pm  Conference VI
Morning Break 10:00am to 10:30am  Conference II
FTIR/Raman 1:00pm to 5:00pm  Conference III
ABC Exam 1:00pm to 5:00pm  Conference V
Afternoon Break 3:00pm to 3:30pm  Conference II
Hospitality Suite 8:00pm to 11:00pm  TBD

_Tours Meet in Atrium Lobby_
Textile Plants (B) 8:00am to 5:00pm
Paint Manufacturing 8:00am to 12:00pm
Plastic Bag Manufacturing 1:00pm to 5:00pm

(L) = Lunch provided in the Piedmont Ballroom, GREEN star
(B) = box lunch provided

**Thursday, October 15**

Plenary Session 8:00am to 3:30pm  Grand Ballroom
Welcome 8:00am to 8:20am
Meredith Emerson/Gary Hilton 8:20am to 12:30am
Morning Break 10:00am to 10:30am
Lunch (Livingston Restaurant) 12:30am to 2:00pm
Battlefield Forensics 2:00pm to 3:30pm
Afternoon Break/Raffle Drawing 3:30pm to 4:00pm  Grand Ballroom
SAFS Business Meeting 4:00pm to 5:00pm  Grand Ballroom
Cocktail Hour 6:00pm to 7:00pm  Fox Theater
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Banquet
Hospitality Suite

7:00pm to 9:00pm  Fox Theater
9:30pm to 11:00pm  TBD

Friday, October 16

Section Meetings
Drug Chemistry
DNA
Trace Evidence

8:00am to 12:00pm

Conference II
Conference III
Conference IV
Advanced Structural Elucidation: Spectral Interpretations
Monday, October 12 8:00am-5:00pm Piedmont Ballroom
Presenter: Bob Ollis, Defense Forensic Science Center

Previous workshops on structural elucidation have focused on the technologies, capabilities, and calibration of GCMS, LCMS, IR, Raman, and NMR systems. This workshop will focus on spectral interpretation of these technologies that will help the attendee when the unknown spectrum is encountered in casework. It is recommended that before this workshop each attendee review the basics of the systems above, as the workshop will focus solely on the spectra. This workshop will consist of brief periods of lecture followed by hands-on group activities. Scientists from all skill levels are encouraged to attend.

Particle Analysis of Building Materials
Monday, October 12 8:00am-5:00pm Conference III
Presenter: Bill Schneck, Microvision Northwest-Forensic Consulting, Inc.

This one-day workshop will consist of a systematic analysis of building materials commonly encountered in microanalysis casework. The course consists of a combination of PowerPoint lectures including case studies and laboratory exercises and demonstrations of building material types. The composition of cement and concrete, fibrous and non-fibrous insulation products, paper, wood and wood composite materials, architectural paint extenders, and plastics will be covered. The particle characterization approach will be employed with emphasis in stereo-binocular microscopy and polarized light microscopy. Detailed instruction and practical exercise in particle characterization of building materials will make the course profitable for both the experienced and novice forensic scientist working in trace evidence, crime scene response, and firearms examination.

Topics in Microspectrophotometry
Monday, October 12 8:00-5:00pm Conference IV
Presenters: Dr. Paul Martin, CRAIC Technologies, and Sarah Walbridge-Jones

This workshop will provide examiners with a unique opportunity to review several different sample spectra that present challenges for interpretation. The first half of the workshop will feature discussions on theory, basic instrument design, and the types of evidence analyzed by microspectroscopy. Attendees will then be split into
groups and will have the opportunity to discuss these challenges and be tasked with specific questions regarding sampling considerations, interpretation, and reporting. Attendees are strongly encouraged to bring difficult casework examples and share their own laboratory procedures relating to microspectrophotometry.

**Troubleshooting the DNA Casework Workflow: Quantitation, Amplification, and Capillary Electrophoresis**  
Monday, October 12 8:00am-12:00pm Conference V  
Presenter: Shelly Guerrero, Applied Biosystems

The workshop will be divided into two sections. One will focus on the quantification process (using the Applied Biosystems™ 7500 Instrument and Quantifiler™ kits in examples) and the second will focus on STR amplification and CE analysis (using Applied Biosystems 3500 instruments and STR kits). We will review troubleshooting tools available to the customer, the Field Application Specialist (FAS), and the Field Service Engineer (FSE) and explain the significance of each tool and when to use them.

For the Quantification portion we will review the basic terminology of real-time PCR and the parameters used to evaluate quant data including standard curve, slope, and Y-intercept. We will also discuss the impact of single copy compared to multi-copy targets used in such kits. Lastly, we will highlight some of the common causes of poor data quality and how to avoid them.

For the Amplification and CE portion we will highlight how raw data, analyzed data, EPT data, capillary view and instrument logs are used to troubleshoot as well as the service tools and software used by the FSE. In these discussions we will also highlight the causes of some common issues and how to avoid them. We will then open the floor to audience questions and offer question and answer session to discuss common issues and how to investigate them. The goal of this workshop is to arm DNA analysts with information needed to identify simple issues that they can resolve themselves and when it is necessary to work with their FAS and FSE team to resolve more complex issues. For Research, Forensic or Paternity Use Only. Not for use in diagnostic procedures.

**Analysis of Pressure Sensitive Tape**  
Monday, October 12 1:00pm -5:00pm Conference V  
Instructor: Thom Hopen, ATF

Breakdown of the types of pressure sensitive tape evidence encountered, manufacturing processes, and methodology for analysis and interpretations.
Grant Writing  
Monday, October 12 1:00pm-5:00pm Conference VI  
Presenter: Henry Maynard, Defense Forensic Science Center

This workshop will help participants become more familiar with forensic science research funding opportunities and also help them learn how to effectively communicate their research ideas through grant writing. Participants will learn how to effectively interpret research solicitations, understand how peer review processes work, and ultimately how to write competitive research proposals.

Ethics in Forensic Science  
Tuesday, October 13 8:00am-12:00pm Mitchell Ballroom  
Presenter: Dr. Paul J. Voss, Ethikos

This is not your run of the mill ethics presentation. Dr. Paul Voss of Georgia State University will be highlighted in a dynamic presentation of a wide application of ethics related topics. Today, more than ever, aspects of culture, leadership, and ethical decision-making play a crucial role in the forensic community. Forensic labs must strive to create a culture of scientific excellence, to be sure, but this cannot happen without an equal commitment to high ethical standards and practices. Ethikos seminars, specifically designed for the forensic community, provide thought-provoking, edifying, and entertaining content in order to support and enhance any organizational culture. Each 3.5-hour seminar will address issues vital to achieving high standards, excellent science, and a healthy culture. The seminars, led by Dr. Paul J. Voss, earn among the highest evaluations in the industry.

Courtroom Testimony  
Don't Get Caught With Your Pants Down: Views from the Bar and Bench on Effective and Ethical Forensic Testimony  
Tuesday, October 13 8:00am-12:00pm Mitchell Ballroom  
Presenters: Jessica Gabel Cino, Georgia State University, and Larry Peterson, Defense Forensic Science Center

Effective communication of scientific expertise, methodology, and conclusions is particularly important in adversarial settings. This workshop focuses on the trials, techniques, and tribulations of expert testimony. It presents a comprehensive approach from two points of view: the lab bench and the legal bar, using concrete examples and discussing current legal hurdles.

Forensic examiners at all experience levels will find the program informative and useful in defining and honing their testimony skills. In addition, the program will
discuss recent developments in law, procedures, and the ruled of evidence related to forensic science. It also includes practical pointers on surviving motions to exclude and how to convey your testimony to a jury.

An important feature of the workshop will be the ethical obligations and quagmires inherent in the forensic examination process. The speakers will discuss difficult situations that can develop at all levels of an investigation: from the crime scene to the courtroom.

Leading the workshop are two nationally recognized experts: Larry Peterson, a forensic chemist at the Defense Forensic Science Center, and Jessica Gabel Cino, a law professor at Georgia State University College of Law.

**Introduction to Mass Spectral Interpretation with Specific Applications to the Novel Psychoactive Substances (Part 1 of 2)**

Tuesday, October 13 8:00am-12:00pm Piedmont Ballroom
Presenter: Jason Nawyn, Defense Forensic Science Center

The GC/MS is typically the “work horse” of forensic drug analysis with the vast majority of drug samples being analyzed on this instrument; as such it is prudent to have a deeper level of understanding of the ionization concepts behind it. This workshop is broken up into two parts each designed to help forensic chemists become more proficient at understanding what the mass spectrometer can tell you (basic interpretation skills of EI spectra) and what the mass spectrometer can’t tell you (limitations of the data). Part 1 of this workshop introduces the basic concepts of mass spectral interpretation skills. We will discuss how a mass spectrometer works, how a sample is ionized, and what happens to that sample once ionized. This includes things such as a review of basic chemistry concepts, fragmentation mechanisms, the nitrogen rule, isotopic clusters, and logical/illogical losses. With these introductory facts the attendee will be prepared to glean certain compound characteristics simply by glancing at a mass spectrum.

**Introduction to Mass Spectral Interpretation with Specific Application to the Novel Psychoactive Substances (Part 2 of 2)**

Tuesday, October 13 1:00pm-5:00pm Piedmont Ballroom
Presenter: Jason Nawyn, Defense Forensic Science Center

The GC/MS is typically the “work horse” of forensic drug analysis with the vast majority of drug samples being analyzed on this instrument; as such it is prudent to have a deeper level of understanding of the ionization concepts behind it. This
workshop is broken up into two parts each designed to help forensic chemists become more proficient at understanding what the mass spectrometer can tell you (basic interpretation skills of EI spectra) and what the mass spectrometer can’t tell you (limitations of the data). Part 2 compares the spectra of NPS compounds (primarily cannabinoids and cathinones) and compares their fragmentation patterns keying in on certain fragmentation characteristics that are similar among the varying classes of compounds. Combining these similarities with the concepts learned in part 1, we will apply these skills to help interpret several unknown compounds. This will include practical exercises (both individual and group) of unknown compounds that will help apply these principles to real world situations. If time permits, we will conclude with a discussion on helpful aids and resources that are readily available in determining unknown compounds.

**Physical Fit**  
Tuesday, October 13 8:00am-12:00pm Conference III  
Presenter: Micheal Villarreal, Defense Forensic Science Center

After attending the workshop, attendees will have learned basic theory of fracture match and gained a better understanding of the applications of this examination in forensic casework. Attendees will have the opportunity to apply their skills by working on practical exercises utilizing case scenarios designed to challenge them and refine their ability to apply this technique. This presentation will impact the forensic community by providing attendees knowledge of fracture match examinations and its uses in the forensic science/law enforcement community.

**DNA/Trace Working Together**  
Tuesday, October 13 8:00am-5:00pm Conference IV  
Presenters: Matney Wyatt, Defense Forensic Science Center, and Donna Ioannidis, Defense Forensic Science Center

The Trace Evidence Branch of a forensic laboratory has historically always gotten along with the once named Serology Branch. Technology took hold and Serology grew up, maturing into today’s DNA Branch of the forensic laboratory. With increasing limits of detection of DNA on the picogram level and Locard’s Exchange Principle as a basis for Trace, examiners from both branches need to be aware of what the other branch is capable of for analysis and how each other’s work can impact the subsequent analysis in the other section. This symposium-style workshop is meant to bring together experienced analysts from Trace and DNA in an attempt to share information so that both sections can work towards a common goal of “Justice Thru Science.” We each need to understand how the other section works so that we do not hinder the work of the other section and so we can
recognize when the other section’s analysis may be important to the case if not previously requested by the submitting agency.

DART

Inquiring Minds Want to Know! A decade of DART and Forensics
Tuesday, October 13 8:00am-12:00pm Conference V
Presenter: Robert B. (Chip) Cody, JOEL

The Direct Analysis in Real Time (DART) ion source was first publicly introduced at the ASMS Sanibel Conference on “MS in Forensic Science and Counterterrorism” in January 2005, followed by the introduction of the first commercial ambient ionization source at PittCon two months later. The past ten years have seen rapid development in the technology and applications of DART and other ambient ionization methods.

Forensic applications of DART have been diverse, including the identification of illicit substances, toxicology, white powders, clandestine laboratories, questioned documents, trace evidence, explosives and smokeless powders, arson, airplane and automobile crash and sexual assault investigations.

Drug identification is perhaps the most widespread forensic application of DART. Analytical procedures have been thoroughly explored, developed, and validated in several Federal, State, private and academic forensic laboratories. A Forensic DART Database comprised of mass spectra measured in the Virginia Department of Forensic Science is now publicly available on the NIST website. Efforts are underway in other laboratories to expand the database to include new and emerging threats. A method for the confirmation of pharmaceuticals that combines DART data with tablet markings has been approved in the Commonwealth of Virginia. DART has also been applied to the analysis of new designer drugs and clandestine laboratory investigations.

New forensic applications of DART are continuing to appear rapidly. The US Fish and Wildlife Forensic Lab has developed methods for identifying illegally imported materials from endangered species based on their chemical profiles as measured by DART and chemometric techniques. This approach has been extended by other researchers to species identification for other materials of forensic interest such as psychotropic seeds, and blowfly puparial casings.

Of course, no single analytical method is universal! Examples will be presented of several ambient ionization methods that are complementary to DART and can be carried out on the same mass spectrometer system without changing hardware.
ALS Techniques for Serology and Trace Evidence

Light: Theory and Applications in Forensic Science
Tuesday, October 13 8:00am-12:00pm Conference VI
Presenter: Foster and Freeman

Think you know all about how to use your Alternate Light Source? A representative from Foster + Freeman will instruct you on tips, tricks, and techniques you may not know about when using this method for serology and trace evidence screening. This is not a marketing session.

We will discuss the basics of light and how light can be used to help find evidence. We will discuss ultraviolet, visible and infrared theory and applications.

Emerging Drugs and Databases for Drug Chemists

Wednesday, October 14 8:00am-5:00pm Mitchell Ballroom
Presenters:
Josh Yohannan, formerly with the Emerging Trends Program at the DEA Special Testing and Research Laboratory, currently a manager with the Allegheny County Office of the Medical Examiner
Dr. Randall Clark, Professor in the Department of Drug Discovery and Development at Auburn University and the author of many peer-reviewed articles dealing with the differentiation of regioisomeric and isobaric compounds related to controlled substances
Donna Iula, Cayman Chemical Company
Dana Harris, Forensic Scientist and Computational Chemist at the Virginia Department of Forensic Science
Lee Fadness, Drug Chemist at the Defense Forensic Science Center

This all-day workshop will focus on the analytical, legal, and theoretical aspects of “Novel Psychoactive Substances,” including synthetic cannabinoids and cathionoes.

Raman and FTIR Instrumental Analysis

Wednesday, October 14 1:00pm-5:00pm Conference III
Presenter: Wil Wihlborg, Thermo Fisher

The FTIR/FT-Raman workshop will include both theoretical and practical components. Basic FTIR and Raman theory will be presented. The use of FTIR and Raman spectroscopy in drug chemistry and trace evidence will be discussed including the hyphenated techniques of GC-IR and FTIR Microscopy. Two FTIR systems will be available for use by attendees. One system will be configured for basic drug identification and a second research level system configured for FTIR and
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FT-Raman analysis. Practical demonstrations of the FTIR and FT-Raman techniques will be provided. Course attendees are encouraged to bring their own samples for FTIR and/or FT-Raman analysis.

Moving to Probabilistic Genotyping Software for DNA Interpretation
Wednesday, October 14 8:00am-5:00pm Conference IV
Presenters: Sara Green, Defense Forensic Science Center, David Diekema, Defense Forensic Science Center, Dawn Bassett, Defense Forensic Science Center, and Christine Tarallo, Defense Forensic Science Center

DNA interpretation continues to be a challenge in forensic laboratories, both with interpreting difficult sample types and with providing consistency between analysts. This is especially true with complex DNA mixtures (i.e., mixtures of more than two individuals, where allelic dropout or drop-in is possible, and/or where a minor contributor is either masked in stutter or under a major contributor. With all this uncertainty, interpretation and evaluating appropriate statistical weight for a person of interest can be problematic with conventional binary models. Recently, probabilistic genotyping methods using a likelihood ratio approach have been proposed and recommended to better account for this uncertainty. These new approaches rely on sophisticated software tools to calculate the results. These software tools require validation and sufficient training on the model in order for the laboratory to adequately implement the tool and effectively testify to the reported results. The Defense Forensic Science Center has been utilizing probabilistic genotyping software in their casework since November 2014. In this one day workshop, DFSC will introduce probabilistic genotyping within a likelihood ratio framework, provide insight and strategies for validating and implementing the tool in casework, as well as discuss practical considerations for developing a training program for analysts. Actual Casework examples using probabilistic genotyping will be discussed as well.

Agenda topics:
Overview of probabilistic genotyping (PG) models for DNA interpretation
“Explanation of the various binary models, how they differ from PG models, and discuss the different PG models (semi and fully continuous, Drop vs. MCMC, biological model)”

Introduction to likelihood ratio (LR) models
“Explanation of the different LR models and the math compared to binary models”

What exactly are you proposing with your LR?
“LR proposition setting and reporting”
Cases worked
“Analysts will discuss cases - 2 casework analysts in attendance”

Validating PG systems

Implementing PG systems

Cognitive Bias in Forensic Laboratories –or- What Your Brain is Doing, Whether You Know It or Not

Wednesday, October 14 8:00am-12:00pm Conference VI
Presenter: Melissa Hehir, Georgia Bureau of Investigation

With recent high-profile crime lab scandals, bias in crime laboratories is a topic for media as well as for researchers. Additionally, the creation of a Human Factors Committee will focus more attention on topics of bias, cognition, and error. Formal training in cognitive bias may not be provided within the scope of traditional discipline-specific training programs, but does impact the day-to-day work and functioning of a crime lab. Future recommendations and changes will require an understanding of both theoretical concepts related to bias in forensic science and practical applications of research in bias and cognition. This lecture will deliver a basic framework for understanding cognitive bias in forensic science through the following topics:

- Cognitive Bias – definitions and major concepts related to forensic science
- A review of forensic science-related research on cognitive bias
- What can we learn about bias from cognitive psychology and behavioral economics
- Expertise and cognitive bias
- The bias blind spot
- Practical solutions for minimizing cognitive bias
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**Tours**

**Fiberglass Manufacturing Tour**
Monday, October 12 8:00am-12:00pm

A walking tour of an Owens-Corning plant manufacturing fiberglass to be followed by discussions with plant personnel discussing distribution and characteristics which can serve as a basis for differentiation. **NOTE: Must wear closed toe shoes and no dresses.**

**3SI Security Device Plant Tour**
Monday, October 12 1:00pm-5:00pm

A walking tour of the 3SI plant manufacturing bank security devices designed to deter robberies. The dye/inks and other components of these devices used in banks and ATMs will be discussed. **NOTE: Must wear closed toe shoes and no dresses.**

**GBI Lab Tour**
Tuesday, October 13 8:00am-12:00pm

This will be a guided tour of the Headquarters lab of the Georgia Bureau of Investigation, which is a full service modern lab including medical examiners’ facilities.

**Glass Fabrication Plant Tour**
Tuesday, October 13 1:00pm-5:00pm

This is a walking tour of the Trulite glass fabrication facility that processes large volumes of glass, including tempering and laminating. A site presentation by a representative from the Guardian company will be included. Guardian is a float glass manufacturer that also coats glass. **NOTE: Must wear closed toe shoes and no dresses.**

**Textile Plants Tours**
Wednesday, October 14 8:00am-5:00pm
Two Plant Tour – Textile fiber and Carpet Manufacturing Plants
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A walking tour of the Shaw carpet manufacturing plant in Dalton, GA to be followed by a walking tour of the Aquafil plant in Cartersville, GA producing solution dyed nylon 6 fibers. NOTE: Must wear closed toe shoes and no dresses.

**Paint Manufacturing Plant Tour**
Wednesday, October 14 8:00am-12:00pm

A walking tour of a paint manufacturing plant to be followed by discussions with plant personnel discussing distribution and characteristics that serve as a basis for differentiation. NOTE: Must wear closed toe shoes and no dresses.

**Plastic Bag Manufacturing Plant Tour**
Wednesday, October 14 1:00pm-5:00pm

This is a walking tour of the Heritage manufacturing plant. The tour will be followed by discussions with plant personnel discussing distribution and characteristics that can serve as a basis for differentiation. NOTE: Must wear closed toe shoes and no dresses.
Meredith Emerson was a 24-year old woman who was last seen alive hiking on Blood Mountain in north Georgia with her dog on New Year's Day 2008. Between January 1 and January 4, 2008, Emerson was abducted and murdered by Gary Hilton. Join us as investigators and scientists discuss the case and how the forensic evidence led to the confession and conviction for not only the murder of Meredith Emerson, but also Cheryl Dunlap in Florida and John and Irene Bryant in North Carolina.

Presenters:
Agent Clay Bridges, Georgia Bureau of Investigation
Agent Annie White, Florida Department of Law Enforcement
Amy George, Analyst, Florida Department of Law Enforcement
Jo Ellen Brown, Analyst, Florida Department of Law Enforcement
Matthew Ruddell, Analyst, Florida Department of Law Enforcement
Merv Stephens, Analyst, Florida Department of Law Enforcement

What is Battlefield Forensics? It involves taking the forensic science used in crime laboratories across the United States and applying those same fundamentals to military operations worldwide. The need for real time forensic exploitation has drastically increased over the last decade because of the critical information it provides to intelligence gathering and incident awareness. The Defense Forensic Science Center (DFSC) has deployed mobile forensic laboratories to numerous countries, while having to overcome unique challenges faced when trying to apply forensic science in austere conditions. While always working to preserve the
science, the challenges faced include deployment locations, external environments, amenities and facilities. Please join us for a look at those challenges in a unique presentation on the DFSC Battlefield Forensics!

Presenters:
Christine Swanson, Defense Forensic Science Center
Matthew Saluto, Defense Forensic Science Center

3:30pm-4:00pm Break/Raffle Drawing

SAFS Business Meeting
Grand Ballroom, Thursday, October 15 4:00pm-5:00pm
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A BIG THANK YOU TO ALL OF OUR VENDORS FOR THEIR SUPPORT!
PLEASE VISIT OUR VENDORS AND SHOW YOUR SUPPORT FOR THEM!

Vendor Hours: Tuesday, October 13, and Wednesday, October 14
8:00am-5:00pm
Vendor Reception: Tuesday, October 13 5:30pm-7:00pm
Conference II

Raffle Rules: Using the provided question/answer sheet, visit our vendors to get the answers. You will need to talk to them to get the answer. Turn in the answers to SAFS Meeting organizers. For every correct answer, you will receive one raffle ticket. If you get all answers correct, you will receive three bonus raffle tickets.
Prizes will be drawn during the afternoon break on Thursday, October 15
Drug Chemistry – Conference II
Moderator – April Brown

Roundtable discussion of issues encountered in drug chemistry casework

DNA – Conference III
Moderator – Donna Ioannidis

Roundtable discussion of issues encountered in serology and DNA casework

Trace Evidence – Conference IV
Moderator – Barb Fallon

Tentative Schedule:

8:00am-8:20am Tammy Jergovich (GBI), OSAC Materials Subgroup Activities Update

8:25am-8:45am Jerry Messman (Stranaska Scientific, LLC), Metrological Qualification of Molecular Spectrometric Instrumentation Used for Forensic Laboratory Analysis and Testing of Trace Evidence

Molecular spectrometric techniques based on UV/VIS, IR, Raman and fluorescence methods of analysis are commonly used for laboratory testing of trace evidence. Most forensic laboratories are familiar with the validation of analytical methods, but the qualification of the analytical instruments on which the methods are run is lesser known and it is practiced less frequently. With an increasing focus on the expert testimony of laboratory measurement results in court, it is vital that laboratories include science-based instrument qualification in their quality assurance programs. Metrological traceability will be described and science-based pathways in the traceability chain will be illustrated in the qualification of UV/VIS, IR, Raman and fluorescence instrumentation. Each link in the traceability chain will be examined to evaluate properties including the substrate material of the higher-order traceability filter(s) used to establish and document traceability, transparency of the metrological timeline, and the identification of a key measurement term and
its viability to facilitate the quantitative estimation of some traceability index as it relates to certain classes of a trace evidence specimen.

8:50am-9:10am Thomas Hopen* and Natasha Neel (Bureau of ATP Forensic Science Laboratory), Circular Polarized Light: A Forgotten Yet Invaluable Technique for Microscopists

Circular polarized light is a simple yet rarely used microscopical technique. The images for the Particles Atlas, Volumes 2 and 5 were taken using this technique. Circular polarized light is accomplished using an anisotropic plate whose thickness is such that the retardation is a quarter of a wavelength for a particular color. This color is usually in the yellow/green region (~550 nm) using white light resulting in a pale gray background color with crossed polars when the privileged directions of the anisotropic plate are 45 degrees to that of the polarizer. The resulting quarter-wave retardation results in a spiral wave motion resembling a cork screw. If viewed looking down the direction the wave is traveling it would appear to be vibrating in a circular motion; hence is said to be circularly polarized light.

When the quarter-wave plate is placed below the sample, the light traveling through anisotropic particles will be broken and travel along the two privileged directions of the crystal. Since the light is traveling in a circular motion, the sample anisotropic crystals will not show the characteristic extinction normally seen when viewed with crossed polars. To obtain a black field and the characteristic retardation colors for the sample particles, a second quarter-wave plate can be inserted between the sample and the analyzer with the slow ray and fast ray perpendicular to the first quarter-wave plate. This technique is particularly useful when searching for isotropic particles such as glass in a mix of soil particles, when doing soil mineral grain counting, characterizing a blend of different fiber types, and, as demonstrated by the Particle Atlas, when taking photomicrographs of samples with crossed polars. Also, it is interesting to note circular polarized light was used to make gun sights for fighter aircraft during WWII which will be demonstrated during the presentation.

9:15am-9:40am Larry Peterson (DFSC/USACIL), The Origin of Hair Testimony Reviews and the USACIL Response

The publishing of a press release by the FBI dated April 20, 2015 on the ongoing review of testimonies by FBI hair examiners has prompted media reports of widespread errors within the FBI and is prompting other labs to begin reviews of testimonies given by their examiners. This talk is an attempt to follow the development of these reviews and give a response to reviews being pursued by the US Army Crime Lab.

9:45am-10:10am Nick Vilbas (Texas Forensic Science Commission), The Texas Commission Process for Hair Testimony Reviews
On July 18, 2013, the United States Department of Justice (DOJ) announced it would review certain cases involving hair microscopy analysis, testimony and reports provided by FBI examiners before December 31, 1999. On April 20, 2015, national media reported the FBI case review found 26 of 28 hair examiners overstated the extent to which an association may be made between a questioned hair and a known hair sample in “ways that favored prosecutors.” Media reports further indicate that the overstatements were concerns in at least 90% of the cases.

The Texas Association of Crime Laboratory Directors responded by publicly acknowledging their shared “ethical and professional duty, as scientists, to take appropriate action if there has been a miscarriage of justice.” This talk will share how the laboratories, with financial and administrative assistance from the Texas Forensic Science Commission, identified hundreds of cases for review pursuant to a sub-sampling approach. Technology challenges and stumbling blocks associated with the case identification and retrieval process will be discussed.

Attendees will also learn how the review team's approach to case analysis is similar to and different from the FBI's approach, focusing on the team's shift away from “error categories” and toward a holistic discussion of common testimony pitfalls. The difficulty of considering the context of an examiner’s testimony and the role of attorneys in communicating—or in some cases misconstruing—scientific concepts before the trier of fact will be discussed. There are tremendous benefits of bringing stakeholders together over an extended period to tackle tough issues in an environment of trust and respect, and ensuring robust training resources are available going forward. For participants interested in conducting a similar review in their home states, discussion will include strategies for moving stakeholders from theoretical agreement to the practical implementation of a case review, including the importance of collaboration and compromise among participants.

Finally, the presentation will address the importance of proactive notification strategies for affected prosecutors and defendants, as well as access to mtDNA testing for affected cases.

10:15am-10:35am  Joshua Friedman (FBI Laboratory), Expedited Hair Examination Results Assist in a Kidnapping/Homicide Investigation

In August 2013 Alexis Murphy was reported missing by her parents. A multiple jurisdiction investigation was initiated. As a result of investigative leads, a subject, Randy Taylor, was developed and a search of his property was conducted. Part of the evidence collected during the initial search included strands of hair which were submitted for analysis. In working with the investigating agents, a streamlined plan of analysis was developed which allowed for expedited results. Not only were these
results used to focus the investigation on a single subject but they were also used as a tool during the interrogation.

10:40am-11:10am  Suzanne Noffsinger (Ohio Bureau of Criminal Investigation Laboratory), The Hunt for a Serial Arsonist: Linking Multiple Cases by Comparison of Hotel Bath Linens

This presentation follows the progression of a serial arson investigation from nine escalating crime scenes through the forensic laboratory, and into both the hotel and textile manufacturing industries. Deliberate fires were set using hotel chain washcloths and hand towels as ignition devices. The investigation lacked forensic evidence until six bath linens were discovered in a suspect’s vehicle. Twenty-seven bath linens recovered from the scenes were compared to those from the suspect in a unique cluster of cases. Hotel and textile manufacturing industries assisted in determining the evidentiary value of the associations.

This presentation will provide attendees with an understanding of the value of analyzing common household items such as bath linens and illustrate the increased discrimination that results from conducting both macroscopic and microscopic examinations. This case study also highlights the contribution of industry resources to a forensic investigation.

11:15am-11:25am  Larry Peterson (DFSC/USACIL), Fiber Transfer: Sgt. Bales Case Study

In March of 2012, 16 Afghan civilians were murdered and 6 wounded in what has been called the “Kandahar massacre”. Very little physical evidence was obtained from very challenging crime scenes. This talk describes the development of textile fiber evidence in the case

11:40am-12:00pm  Barb Fallon (Michigan State University), Jute Species and Their Substitutes in Common Goods

Natural fibers from jute (*Corchorus capsularis* and *C. olitorius*) are common in commodities such as cordage, sacking, and textiles. Jute can be identified and distinguished from other common vegetable fiber on the basis of its microscopic characteristics. Currently neither chemical nor microscopic methods exist to differentiate fibers from these two jute species. Comparison of the measured length, width, and area of ultimates revealed no differences in these properties between the species. A preliminary investigation of Raman spectroscopy band height ratios indicative of cell wall cellulose spiraling was also unable to discriminate between the two species.
Furthermore, other natural fibers and some synthetic fibers may be substituted in commercial goods advertised as jute. Examples of these substitutions will be presented as will the ways in which polarized light microscopy can be used to separate real and fake jute. Ultimately, it is the goal of this research to compile an open access list of items in which jute is present and/or substituted. In labs with limited time and resources, this compilation is anticipated to be a useful resource to assist examiners in a more thorough examination of particular product types.