



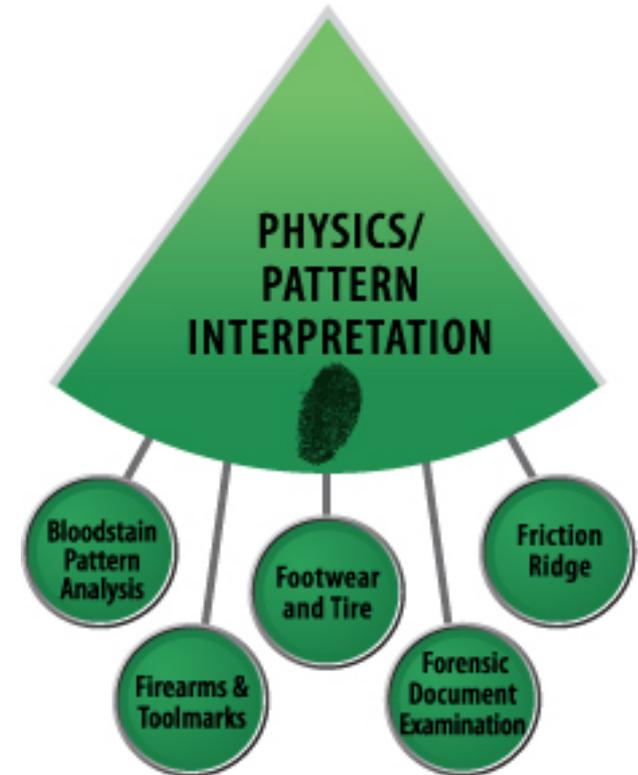
# Physics and Pattern Evidence Scientific Area Committee

Chair: Melissa Gische, FBI  
AAFS — February 2018



# Pattern SAC Leadership

- Officers
  - Chair: Melissa Gische, FBI
  - Vice Chair: R. Austin Hicklin, Noblis
  - Executive Secretary: Thomas Busey, Indiana University, Bloomington
- Subcommittee Chairs:
  - Bloodstain Pattern Analysis: Toby Wolson, Retired (Miami-Dade Police Department)
  - Firearms and Toolmarks: Todd Weller, Weller Forensics
  - Footwear and Tire: G. Matt Johnson, Orange County Crime Laboratory
  - Forensic Document Examination: Gerry LaPorte, NIJ
  - Friction Ridge: Henry Swofford, Defense Forensic Science Center





# Pattern SAC Members and Liaisons

- Members
  - David Baldwin, Special Technologies Laboratory, USDOE
  - Ted Burkes, Federal Bureau of Investigation
  - Lesley Hammer, Hammer Forensics
  - Paul Kish, Paul Erwin Kish Forensic Consultant & Associates
  - Hal Stern, University of California, Irvine
  - David Stoney, Stoney Forensic, Inc.
  - John Vanderkolk, Indiana State Police Laboratory Division
- Ex-Officio Members
  - Liaison to Human Factors Committee: Rick Lempert, University of Michigan
  - Liaison to Legal Resource Committee: David Kaye, Pennsylvania State School of Law
  - Liaison to Quality Infrastructure Committee: Erin Henry, Oklahoma State Bureau of Investigation



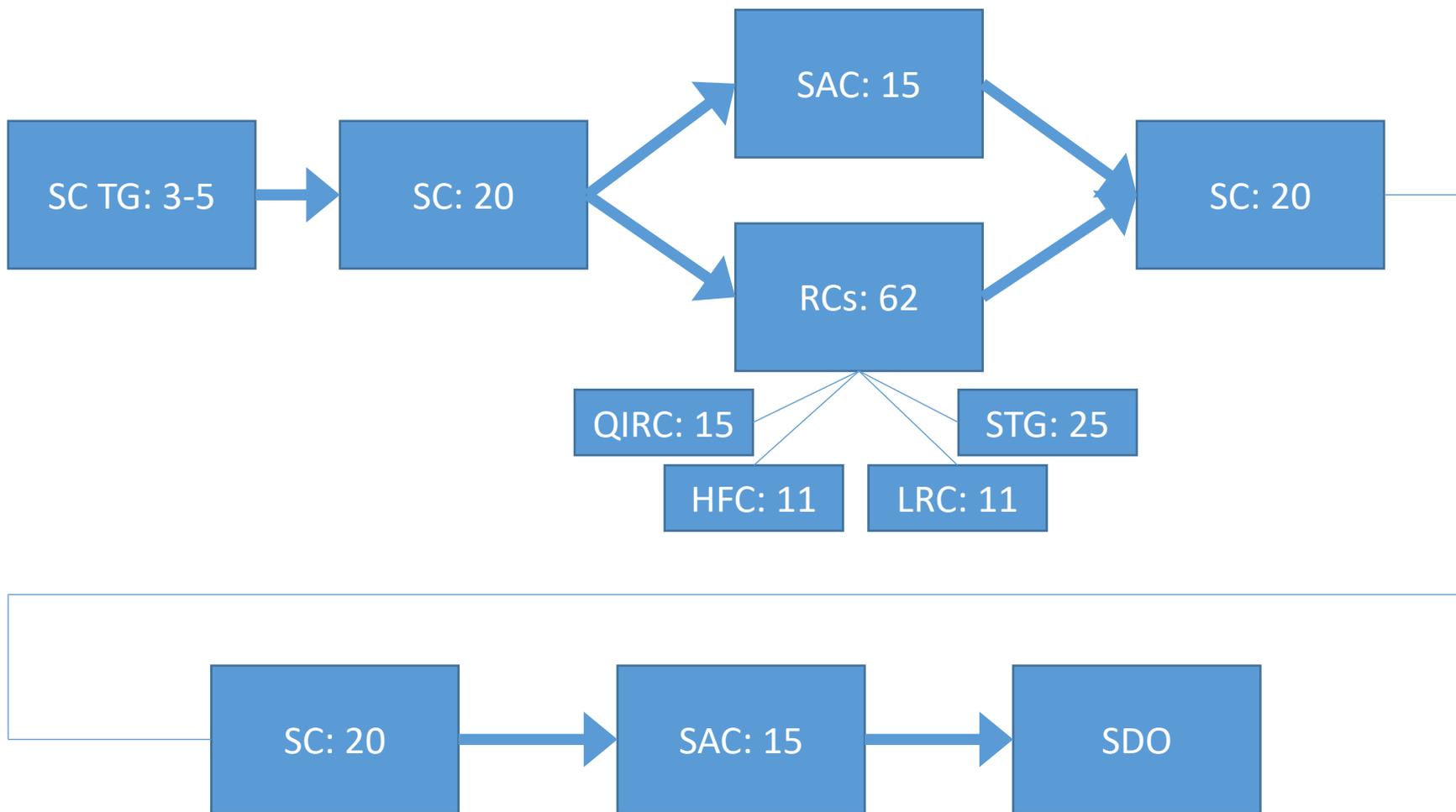


# Pattern SAC: Role

- Provide direction and oversight for 5 subcommittees
  - Firearms & Toolmarks
  - Footwear and Tire
  - Friction Ridge
  - Questioned Documents
  - Bloodstain Pattern Analysis
- Interface with the resource committees
  - Human Factors
  - Legal Resource
  - Quality Infrastructure
  - (OSAC-wide Forensic Statistics Task Group)
- Communicate activities, progress, recommendations
- Review and approve standards and guidelines
- Coordinate research priorities



# General Process





# AAFS Standards Board (ASB)

Physics and Pattern Evidence SAC subcommittees are using the AAFS Standards Board (ASB) as the Standards Development Organization (SDO) for completed documents. The ASB has three types of documents.

- Standards (S)
- Technical Reports (TR)
- Best Practice Recommendations (BPR)



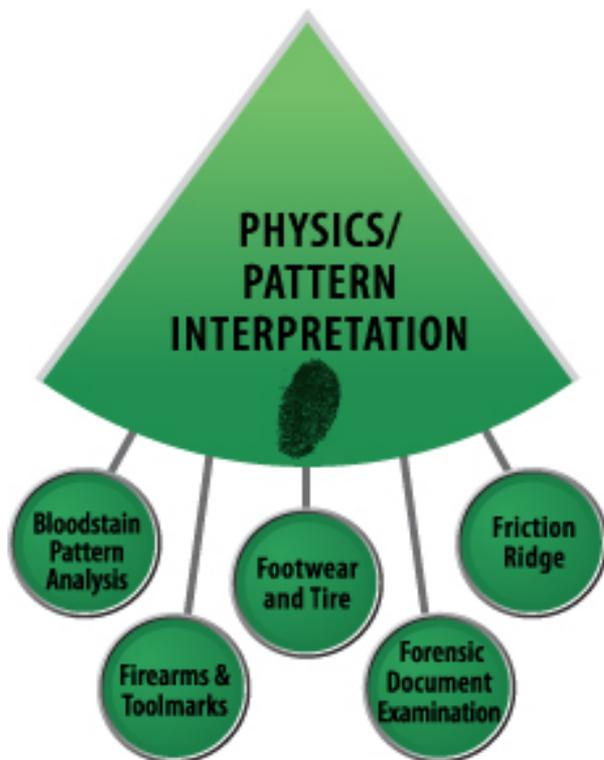


# Bloodstain Pattern Analysis Subcommittee

February 2018



# Bloodstain Pattern Analysis



- The Bloodstain Pattern Analysis Subcommittee will focus on standards and guidelines related to the scientific detection and analysis of bloodstain patterns present at crime scenes and on associated evidence.



# Subcommittee Leadership

Position	Name	Organization	Term	Email
Chair	Toby L. Wolson, M.S.	Noslow Forensic Consultations, LLC	2019	toby.wolson@gmail.com
Vice Chair	Jeff Gurvis	National Forensic Support Laboratory	2018	Jeff.gurvis@nflslab.com
Executive Secretary	Holly Latham	Kansas Bureau of Investigation	2019	bloodstainanalyst@live.com



# Subcommittee Members



#	Name	Organization	Term	Email
1	<b>Kim Clements, MSFS</b>	D.C. Consolidated Forensic Laboratory	2020	kimberly.clements@dc.gov
2	<b>Tom J. Griffin</b>	Bevel, Gardner & Associates	2020	grifclue@comcast.net
3	<b>Cristina Gonzalez</b>	Los Angeles Sheriff's Department	2019	ccgonzal@lasd.org
4	<b>Leah Innocci</b>	Wyoming State Crime Laboratory	2019	Innocci1@gmail.com
5	<b>Kenneth Martin, MS</b>	Bevel, Gardner & Associates	2019	kf.martin@verizon.net
6	<b>Stephen Michielsen, PhD</b>	North Carolina State University	2018	smichie@ncsu.edu
7	<b>Jeremiah Morris</b>	Johnson County Sheriff's Office	2020	jeremiah.morris@jocogov.org
8	<b>Elizabeth Pierri, MSFS</b>	Naval Criminal Investigative Service	2020	elizabeth.pierri@ncis.navy.mil
9	<b>Susan Rinehart</b>	LAPD Crime Laboratory	2018	g9670@lapd.online
10	<b>Elizabeth Richards, PhD</b>	USAF Office of Special Investigations	2020	elizabeth.richards@us.af.mil
11	<b>Jason S. Simser, PhD</b>	MN Bureau of Criminal Apprehension	2019	jason.simser@state.mn.us
12	<b>LeeAnn Singley, MS</b>	Grayson Singley Associates	2018	lsingleygsa@msn.com
13	<b>Gabriele Suboch, PhD</b>	Northcentral University	2019	forensics25@hotmail.com
14	<b>Peter Valentin, PhD</b>	University of New Haven	2020	pvalentin@newhaven.edu
15	<b>Haonan Wang, PhD</b>	Colorado State University	2018	wanghn@stat.colostate.edu
16	<b>Gary Wilgus</b>	Ohio Bureau of Criminal Investigation	2020	gary.wilgus@ohioattorneygeneral.gov
17	<b>Kevin Winer</b>	Kansas City Police Department	2018	kevin.winer@kcpd.org

# Past Subcommittee Members



#	Name	Organization	Term	Email
1	Almon Brown	S.C. Law Enforcement Division (SELD)		
2	Peter De Forest, DCrim	Retired Professor/Consultant		
3	James O. Pex, MS	International Forensic Experts, LLC		
4	Ralph R. Ristenbatt, III	The Pennsylvania State University		
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# BPA SUBCOMMITTEE AFFILIATES

- The BPA Subcommittee currently has 50+ BPA experts that have volunteered to be affiliates. They represent 6 countries, public, private, academia, law enforcement, crime scene investigations, crime laboratory, and judicial sectors.
- Addition of affiliates to task groups is based on the needs of the task group and the specific BPA expertise of the affiliate.
- To become an OSAC affiliate, it is recommended that you complete an OSAC application at <https://www.nist.gov/forensics/osac-application.cfm>.



# ASB approved documents

- ASB Technical Report 033, *Terms and Definitions in Bloodstain Pattern Analysis*, First Edition, 2017 ([https://asb.aafs.org/wp-content/uploads/2017/11/033\\_TR\\_e1\\_2017.pdf](https://asb.aafs.org/wp-content/uploads/2017/11/033_TR_e1_2017.pdf))



# Documents at ASB

- Guidelines for Report Writing in Bloodstain Pattern Analysis
- Guidelines for the Validation of New Procedures in Bloodstain Pattern Analysis
- Guidelines for the Minimum Education and Training Requirements For Bloodstain Pattern Analysts
- Guidelines for a Quality Assurance Program in Bloodstain Pattern Analysis

# Documents in progress

- Conclusion statements for bloodstain pattern identifications
- Conclusion statements for BPA reconstructions
- BPA taxonomy for use in classification of bloodstain patterns
- Guidelines for a BPA Certification Program
- Guidelines for Developing Standard Operating Procedures for Bloodstain Pattern Analysis
- Guidelines for Proficiency Testing in Bloodstain Pattern Analysis
- BPA process map



# Research Needs

- Current list of BPA research needs is available on NIST.gov (<https://www.nist.gov/topics/forensic-science/osac-research-development-needs>)





# Firearms and Toolmarks Subcommittee

February 2018





# Subcommittee Leadership

Position	Name	Organization	Email
Chair*	Todd Weller	Weller Forensics	toddweller@wellerforensics.com
Vice Chair	Andy Smith	San Francisco Police Dept Crime Lab	andy.smith@sfgov.org
Executive Secretary	Wendy Gibson	VA Dept of Forensic Science	Wendy.gibson@dfs.virginia.gov

\*In October 2017, Andy Smith stepped down as Chair and Todd Weller was appointed Chair





# Subcommittee Voting Members

#	Name	Organization
1	Steve Scott	FBI
2	Mike Neel	BATF
3	Xiaoyu Alan Zheng	NIST
4	Ted Vorburger, PhD	NIST
5	Eric Collins	Contra Costa Co Sheriff Forensic Services
6	Doug Murphy	FBI
7	Max Morris, PhD	Iowa State University
8	Chris Monturo	Miami Valley Regional Crime Lab
9	Erich Smith	FBI
10	James Carroll	Los Angeles County Sheriff's Office
11	Cassey Allen	TX Department of Public Safety - Austin
12	Ryan Lilien, MD, PhD	Cadre Research Labs
13	Ron Nichols	Nichols Forensic Science Consulting
14	Bill Demuth	Illinois State Police
15	Melissa Oberg*	Indiana State Police Crime Lab
16	Erica Lawton*	Alabama Department of Forensic Science
17	Nicholas Petraco*	John Jay College

\*Melissa Oberg, Erica Lawton, and Nicholas Petraco are new members starting late 2017



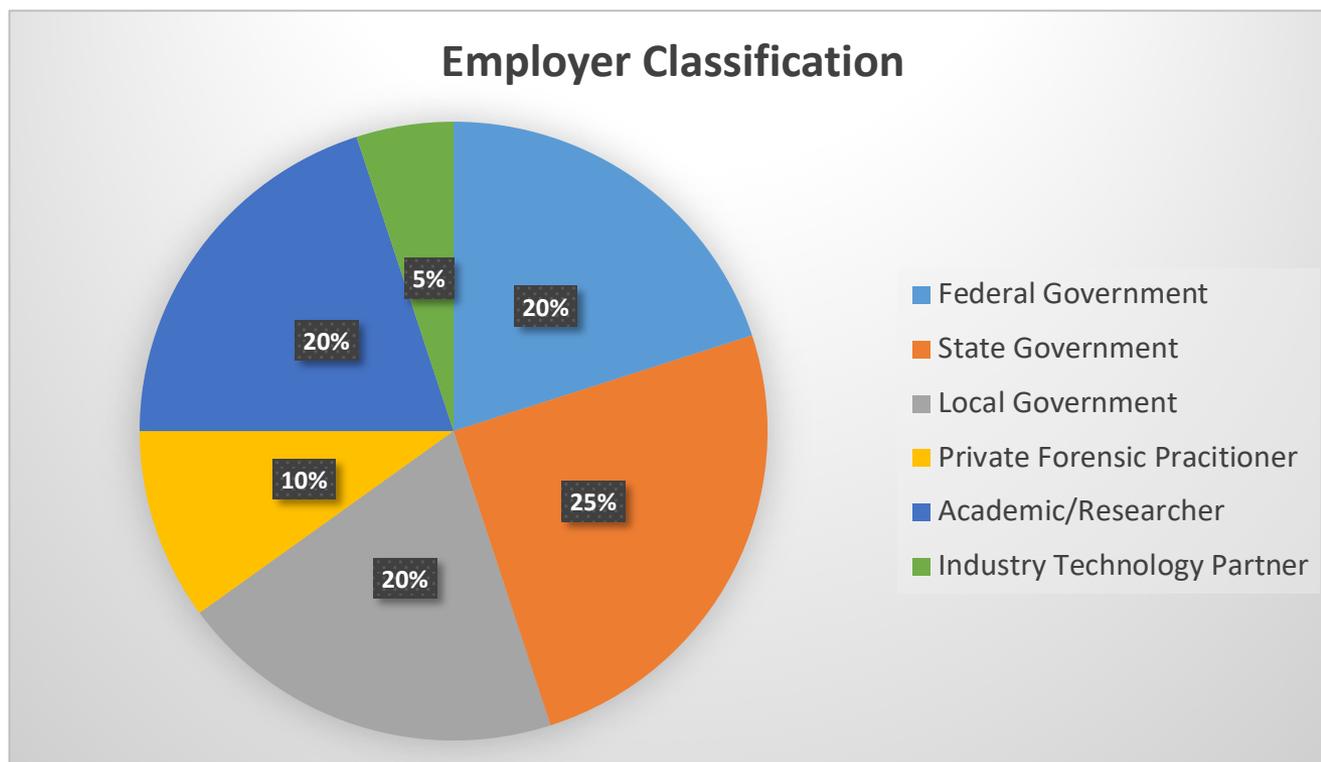


# Subcommittee Affiliate Members

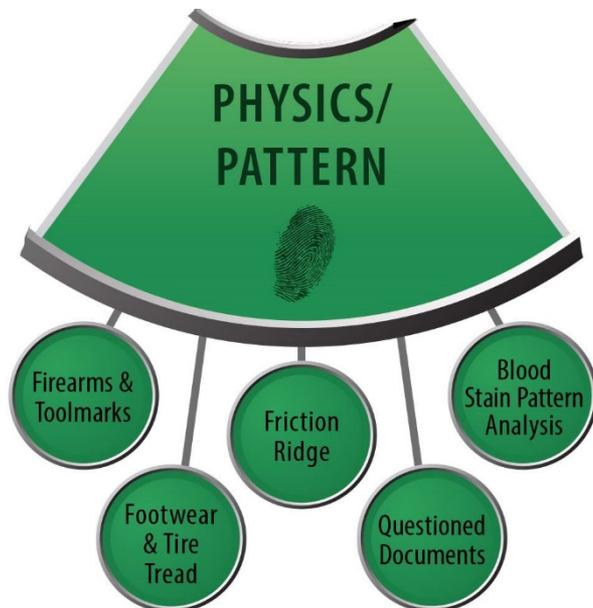
#	Name	Organization
1	Jodi Marsanopoli	BATF
2	John Murdock	Contra Costa County Crime Laboratory
3	Nancy McCombs	California Department of Justice, Fresno
4	John Marshall	RCMP Forensic Lab, Ottawa
5	Gerhard Wevers	Institute of Environmental Science and Research, New Zealand
6	Carey Alvarez Bacha	Aurora Police Department Crime Laboratory



# Employer Classification Mix of Voting Members



# Discipline Description

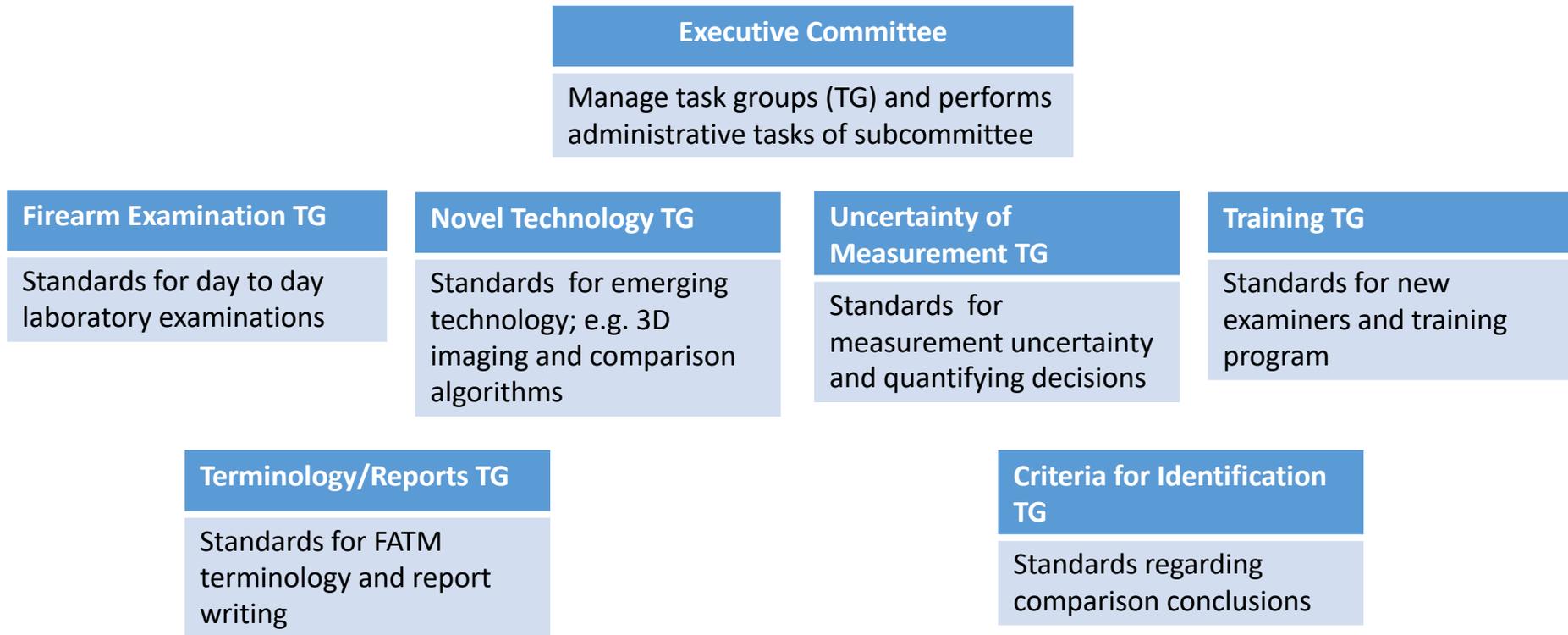


The Subcommittee on Firearms and Toolmarks will focus on standards and guidelines related to the examination of firearm and toolmark evidence. This includes the comparison of microscopic toolmarks on bullets, cartridge cases, and other ammunition components. Examinations may also include firearm function testing, serial number restoration, muzzle-to-object distance determination, tools, and toolmarks.

<https://www.nist.gov/topics/forensic-science/organization-scientific-area-committees-osac/firearms-and-toolmarks>

SWGgun legacy documents, research needs, etc.

# Overview & Roadmap of FATM Subcommittee



Three years ago FATM subcommittee formed six task groups to focus on the most pressing/important topic areas in the discipline. The same task groups still exist and continue to work on standards and guidelines in each topic area.



# Documents at ASB

- Standard for Topography Comparison Software for Firearm and Toolmark Analysis
- Standard for Implementation of 3D Technologies in Forensic Laboratories for Firearm and Toolmark Analysis
- Standard for 3D Measurement Systems and Measurement Quality Control for Firearm and Toolmark Analysis
- Standard for Barrel and Overall Length Measurements for Firearms, includes guidelines and example spreadsheets for calculating uncertainty

# Documents in progress

- Standard Guideline/Best Practice for the Safe Handling of Firearms and Ammunition
- Standard Test Method for the Physical Examination and Classification of Firearms
- Standard Test Method for Function/Operability Testing of Firearms
- Virtual Microscopy
- Uncertainty for Trigger Pull Measurement
- Statistical Standards for Source Identification and Related Quantities
- Minimum Academic Qualifications of Firearm/Toolmark Examiners
- Minimum Requirements for an Examiner Training Program
- Standard Range of Source Conclusions and Criteria for Firearm and Toolmark Examinations
- Standard for Supporting Documentation of Source Conclusions
- Expression of Source Conclusions
- Verification of Source Conclusions
- OSAC Subcommittee on Firearms and Toolmarks Glossary

# Research Needs

- In Jan 2016, FSSB asked that we highlight topics appropriate for additional research. Five topics highlighted:
  - Assessment of Examiners' Toolmark Categorization Accuracy
  - Blind Verifications Needs Assessment
  - Cognitive Bias: To What Extent Does It Affect Firearm and Toolmark Comparison Outcomes
  - Effect of New Technology on Quantitative Consecutive Matching Striae ID Criteria
  - Study to Assess the Accuracy and Reliability of Firearms and Toolmarks (i.e. error rate study)
- Forms and more details available on website
- Will reassess and update in near future as some of these needs are being filled (e.g. numerous error rate studies are in progress)



# Forensic Document Examination Subcommittee

## February 2018





# Subcommittee Leadership

Position	Name	Organization	Email
Chair	Gerry LaPorte	NIJ	<a href="mailto:gerald.laporte@usdoj.gov">gerald.laporte@usdoj.gov</a>
Vice Chair	John Osborn	Private Examiner	<a href="mailto:jposborn@aol.com">jposborn@aol.com</a>
Executive Secretary	Thomas Riley	Private Examiner	<a href="mailto:Tomriley57@gmail.com">Tomriley57@gmail.com</a>

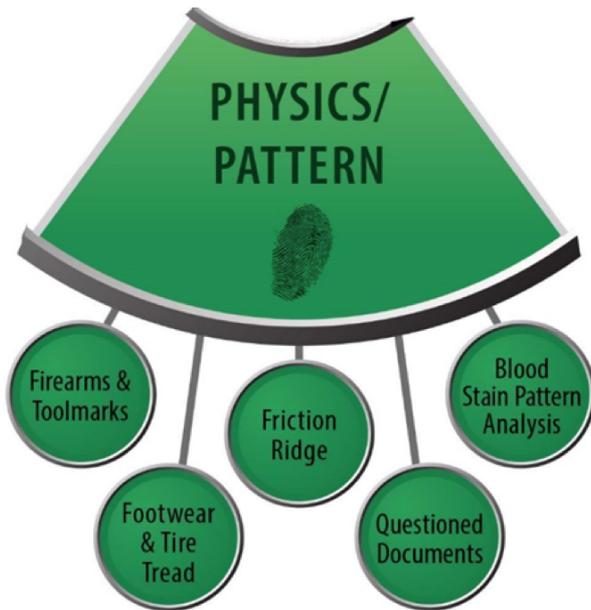


# Subcommittee Voting Members

#	Name	Organization
1	Miriam Angel	Los Angeles Police Department
2	Brett Bishop	Washington State Patrol
3	Mark Goff	Michigan State Police
4	Lisa Hanson	Private Examiner (Minnesota Bureau of Criminal Apprehension – Retired)
5	Derek Hammond	United States Army Criminal Investigation Laboratory
6	Jan Kelly	Private Examiner (Las Vegas MPD – Retired)
7	Kevin Kulbacki	Internal Revenue Service
8	Mark Lancaster	Northern Kentucky University
9	Gary Licht	Iowa Division of Criminal Investigation Criminalistics Laboratory
10	Hector Maldonado	FBI
11	Mara Merlino	Kentucky State University
12	Karen Nobles	Private Examiner (Florida Department of Law Enforcement – Retired_
13	Chis Saunders	South Dakota State University
14	Joseph Stephens	FBI
15	Peter Tytell	Private Examiner
16	Rigo Vargas	Mississippi Forensics Laboratory
17	Elaine Wooton	Department of Homeland Security



# Discipline Description



## Forensic Document Examination

The Subcommittee on Forensic Document Examination will focus on standards and guidelines related to the discipline, including:

- (1) source of handwriting, (2) source of machine-produced documents, typewriting, or other impressions and marks, (3) materials and devices involved in the production of documents, (4) genuineness and alterations, (5) preservation and/or restoration of legibility, (6) documentation and reporting, and (7) training and competency.



# Documents at ASB

- Scope of Expertise in Forensic Document Examination
- Standard for Examination of Handwritten Items\*
- Standard for Examination of Indented Writing\*
- Standard for Examination of Alterations and Obliterations\*

\*Not OSAC work products (legacy ASTM documents)



# Documents in progress

- Standard Guide for Minimum Training Requirements for Forensic Document Examiners (Standard Training Program for Forensic Document Examiners)
- Standard Terminology Relating to The Examination of Questioned Documents
- Standard for Source Conclusions
- Forensic Document Examination Bibliography
- Standard for Collection of Known Writing
- Standard for Initial Assessment of Questioned Document Evidence

# Future Standards/Best Practices

- Test Methods for Forensic Writing Ink Comparison
- Non-destructive Examination of Paper
- Examination of Documents Produced with Liquid Ink Jet Technology
- Examination of Documents Produced with Toner Technology
- Examination of Typewritten Items
- Examination of Rubber Stamps
- Examination of Dry Seal Embossments
- Examination of Financial, Identification, and Other Authorized Documents

# OSAC Research Needs

1. Comparability and Complexity in Handwriting
2. Hand printing complexity and comparability
3. National Database of Handwriting
4. Further validation of the conclusion scale used in forensic document examinations



# Footwear and Tire Track Subcommittee

## February 2018





# Subcommittee Leadership

Position	Name	Organization	Term	Email
Chair	G. Matt Johnson	Orange County Sheriff's Dept.	2014-2019	gmj@occl.ocgov.com
Vice Chair	Rodney Schenck	Defense Forensic Science Center	2014-2018	Rodney.A.Schenck2.civ@mail.mil
Executive Secretary	Stephen Greene	US Customs and Border Protection	2014-2019	Stephen.D.Greene@cbp.dhs.gov



# Subcommittee Members



#	Name	Organization	Term	Email
1	Bohne, Sarah	Colorado Springs Police Department	2014-2018	sarahebohne@gmail.com
2	Dumitra, Aurora	NYPD Police Laboratory	2014-2019	aurora.dumitra@yahoo.com
3	Gorn, Michael	Federal Bureau of Investigation	2014-2018	gornmichael@aol.com
4	Hamburg, Christopher	Oregon State Police	2014-2017	chris.hamburg@state.or.us
5	Homer, Cindy	Maine State Police Crime Laboratory	2014-2018	cindy.homer@gmail.com
6	Jagmin, Jeff	Washington State Patrol	2015-2019	jeff.jagmin@wsp.wa.gov
7	Kanaris, David	Alaska Scientific Crime Detection Laboratory	2015-2018	david.kanaris@alaska.gov
8	Lane, Amanda	Virginia Department of Forensic Science	2014-2018	amanda.lane@dfs.virginia.gov
9	Lund, Steven	NIST	2015-2019	steven.lund@nist.gov
10	Koertner, Anthony	Federal Bureau of Investigation	2018-2021	anthony.j.koertner.civ@mail.mil
11	Mueller, Ron	Charlotte County Sheriff's Office	2015-2019	rmueller@ccso.org
12	Snyder, Christine	Seminole County Sheriff's Office	2017-2020	csnyder@seminolesheriff.org
13	Speir Ph.D., Jacqueline	West Virginia University	2015-2019	Jacqueline.Speir@mail.wvu.edu
14	Ragaza, Lisa	Connecticut State Laboratory	2017-2020	Lisa.Ragaza@ct.gov
15	Wilcox, Alicia	Husson University	2017-2020	wilcoxa@husson.edu



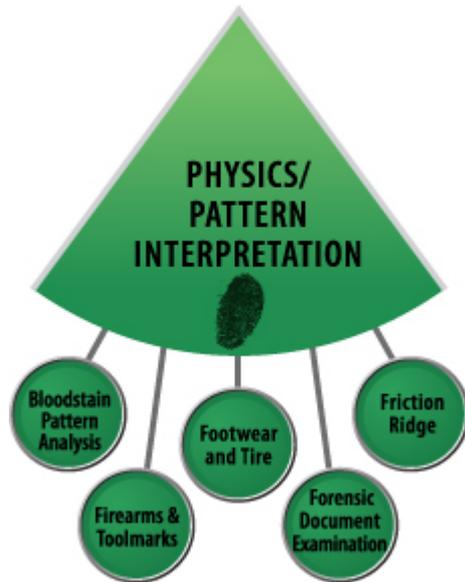
# Affiliates



#	Name	Organization	Term	Email
1	Yamashita, Brian	Royal Canadian Mounted Police (Ret.)/Researcher	2015-	abriany@magma.ca
2	Richetelli, Nicole	West Virginia University/Researcher	2018-	nrichete@mix.wvu.edu
3	Hilderbrand, Dwane	Forensic ITC Services	2018-	Dwane@forensicitc.com
4	Kainuma, Alan	Honolulu Police Department	2018-	akainuma@honolulu.gov



# Footwear and Tire



## Scope:

Detection, documentation, recovery, examination and comparison of footwear and tire evidence.



# Documents at ASB

- Guideline for the Preparation of Test Impressions from Footwear and Tires



# Documents in Progress

- Minimum Qualifications and Training for Footwear and Tire Examiner
- Forensic Documentation and Photography of Footwear and Tire Impressions at the Crime Scene
- Terminology for Footwear and Tire Impressions
- Chemical Enhancements of Footwear and Tire Impressions
- Proficiency Testing for Footwear and Tire Examinations
- Comparison Casework Documentation for Footwear and Tire Examinations
- Detection of Footwear and Tire Track Evidence at Crime Scenes
- Examination Procedures for Footwear and Tire Comparisons
- Scope of Work for Footwear and Tire Examiners



# Future Documents

- Articulation of Conclusions in Footwear and Tire Report Writing and Testimony.



# Research & Development Needs Identified



- Examiner Reliability Study: Black/White Box Study on Footwear and Tire Examiners
- National Footwear Database/Reference Collection
- Population Frequency of Class Characteristics: Footwear in the United States
- Testing and Validation of 3D Imaging Technologies for Footwear & Tire Impression Evidence
- Probability Study of Randomly Acquired Characteristics (RACs).





# Friction Ridge Subcommittee

February 2018



# Subcommittee Leadership

- **Chair**: Henry Swofford
  - Defense Forensic Science Center
  - Term expiration September 30, 2020
  - Email: [Henry.J.Swofford.Civ@mail.mil](mailto:Henry.J.Swofford.Civ@mail.mil)
  
- **Vice Chair**: Thomas Wortman
  - Defense Forensic Science Center
  - Term expiration September 30, 2018
  - Email: [Thomas.M.Wortman.Civ@mail.mil](mailto:Thomas.M.Wortman.Civ@mail.mil)
  
- **Executive Secretary**: Maria Ruggiero
  - Los Angeles County Sheriff's Office
  - Term expiration September 30, 2019
  - Email: [mcruggie@lasd.org](mailto:mcruggie@lasd.org)

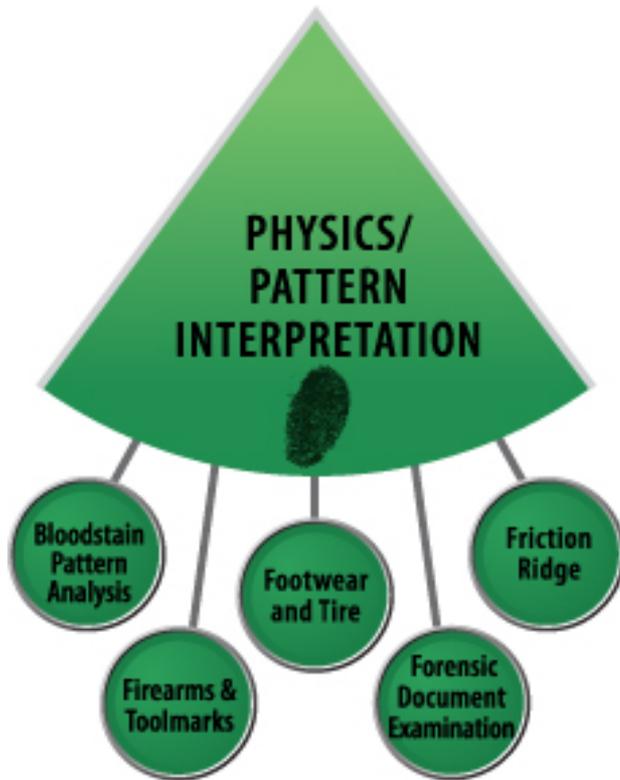


# Subcommittee Membership

• Black, John P.	Black & White Forensics, LLC	2018	john@bwforensics.com
• Brock, Steven	Santa Clara County Sheriff's Office	2018	Steve.Brock@shf.sccgov.org
• Connelly, Joshua	Douglas County Sheriff	2019	joshua.connelly@douglascounty-ne.gov
• Eldridge, Heidi	RTI	2019	heidi.eldridge@icloud.com
• Fontaine, Liz	FBI Laboratory	2020	ekfontaine@fbi.gov
• French, Michael, K.	MorphoTrak, LLC	2018	michael.french@morpho.com
• German, Edward R.	Macon County Sheriff's Office	2018	ed.german@sheriff-macon-il.us
• Hall, Carey	Minnesota Bureau of Criminal Apprehension	2019	carey.hall@state.mn.us
• Hornickel, Mandi	Illinois State Police	2020	Mandi_hornickel@isp.state.il.us
• Kriel, Louis	Georgia Bureau of Investigation	2017	louis.kriel@gbi.ga.gov
• Lavine, Michael	Umass Amhearst	2020	lavine@math.umass.edu
• Ruggiero, Maria C.	Los Angeles County Sheriff's Department	2019	mcruggie@lasd.org
• Schwarz, Matthew T.	Schwarz Forensic Enterprises, Inc.	2019	matt@schwarzforensic.com
• Smith, Ron	Ron Smith & Associates, Inc.	2020	ron@ronsmithandassociates.com
• Speckels, Carl	City of Phoenix Crime Laboratory	2017	carl.speckels@phoenix.gov
• Swofford, Henry J.	Defense Forensic Science Center	2020	Henry.j.Swofford.civ@mail.mil
• Tabassi, Elham	National Institute of Standards and Technology	2018	elham.tabassi@nist.gov
• White, Alice	Las Vegas Metropolitan Police Department	2020	alicevirginiawhite@gmail.com
• Wortman, Thomas M.	Defense Forensic Science Center	2018	thomas.m.wortman.civ@mail.mil
• Zinn, Lisa M.	Orange County Sheriff's Crime Laboratory	2019	lzinn@occl.ocgov.com



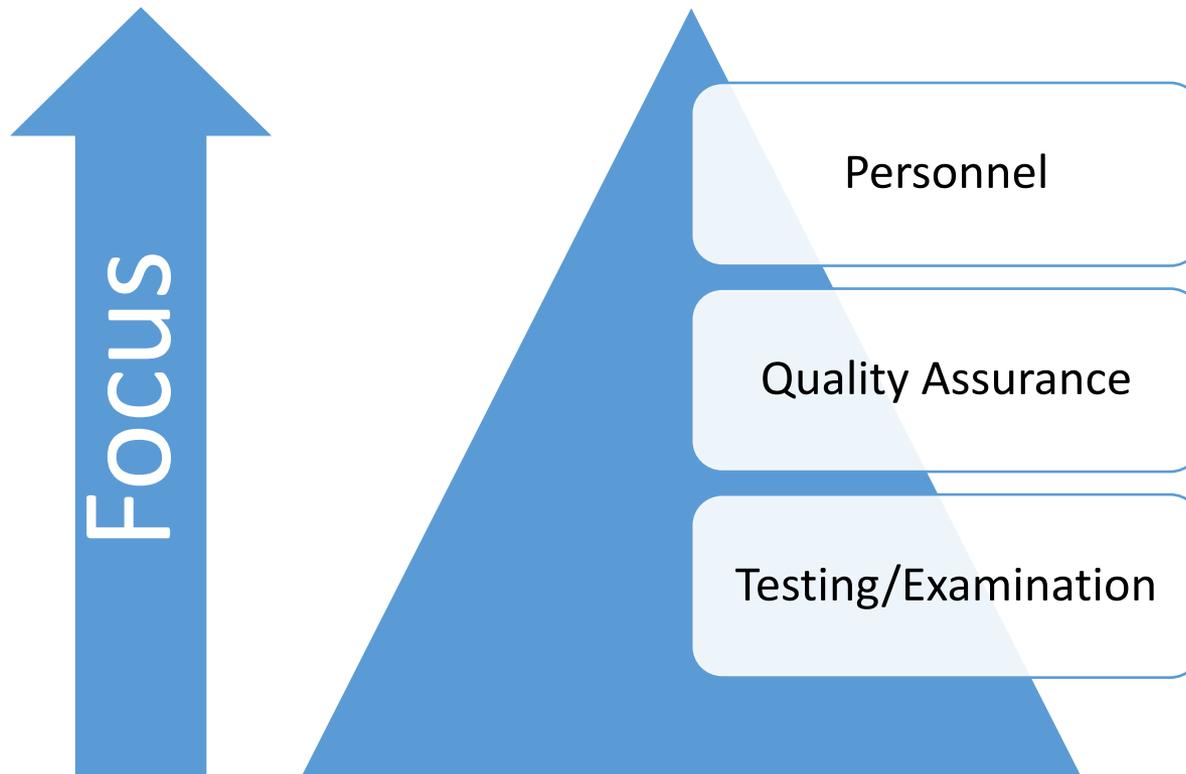
# Scope



The Friction Ridge Subcommittee will focus on standards and guidelines related to the forensic examination of friction ridge detail from the hands and feet.

# Roadmap

- Current Strategic Priority:
  - Promulgation of standards and guidelines related to the **examination, interpretation, and reporting** of friction ridge evidence



# Documents at ASB

- ✓ Guideline for the Articulation of the Decision-Making Process Leading to an Expert Opinion of Source Identification in Friction Ridge Examinations
  
- ✓ Standard for Friction Ridge Examination Training
  
- Document drafts publically available online:
  - <https://www.nist.gov/topics/forensic-science/friction-ridge-subcommittee>

# Documents in progress

- Source Conclusions
- ACE-V Process Map
- Examination Method
  - Analysis
  - Comparison/Evaluation
- Verification
- Technical Review
- Terminology
- AFIS Best Practices

# Current Research Needs

- ACE-V Bias
- Assessing the Sufficiency and Strength of Friction Ridge Features
- Close Non-Match Assessment
- Examiner Consistency During Friction Ridge Feature Mark-Up
- Friction Ridge Statistical Modeling
- Latent Fingerprint Image Quality Usage
  
- Research needs publically available online:
  - <https://www.nist.gov/topics/forensic-science/osac-research-development-needs>

# Additional Items of Interest

- ✓ OSAC FRS Response to PCAST
- ✓ OSAC FRS Response to the DoJ Proposed Uniform Language for Testimony and Reports
- ✓ OSAC FRS Response to the DoJ Forensic Science Discipline Reviews
- ✓ Discipline-Specific Baseline Documents (i.e. legacy SWGFAST documents)
  
- Documents publically available online:
  - <https://www.nist.gov/topics/forensic-science/friction-ridge-subcommittee>

# Visit us online!

<https://www.nist.gov/topics/forensic-science/friction-ridge-subcommittee>





## Questions?

<https://www.nist.gov/topics/forensic-science/organization-scientific-area-committees-osac>

Melissa Gische

[mrgische@fbi.gov](mailto:mrgische@fbi.gov)





# Individualizations, Identifications, and Associations, Oh My!

R. Austin Hicklin, Chair  
OSAC VSC#5 Source Conclusions

