

MONDAY, DECEMBER 6, 2010

8:30 AM      **Registration**

9:00 AM      **Welcome and Opening Remarks**

- Mark Stolorow, Director, Law Enforcement Standards Office
- John Laub, Director, National Institute of Justice (NIJ)
- Pat Gallagher, Director, National Institute for Standards and Technology (NIST)

9:45 AM      **Introduction**

- Sue Ballou, Program Manager, Law Enforcement Standards Office

10:45 PM

### STANDARD REFERENCE MATERIALS (SRM)

#### **Forensic DNA SRM Updates**

Introduction to the Applied Genetics Group along with an overview of the Past, Present and Future SRMs developed for the Forensic DNA community.

- John Butler, NIST Fellow & Applied Genetics Group Leader, Biochemical Science Division
- Margaret Kline, Research Biologist, Biochemical Science Division

#### **NIST's SRM 2461 Standard Casing Reference Material Project**

- Ted Vorburger, Guest Researcher, Mechanical Metrology Division

#### **3-Dimensional Photographic Scale for Impression Evidence Ruler**

In all criminal and civil cases documentation by digital and film photography must have a measurement unit in the frame as a reference. This project is working to develop, evaluate, and test, a proof of concept of a photographic scale that is adaptable for use as both a conventional crime scene photography, and three-dimensional image acquisition and rendering of tire track and footwear impression evidence.

- Ted Doiron, Lead Physicist, Mechanical Metrology Division

*Moderated by Robert Thompson, Program Manager, Forensics Science, Law Enforcement Standards Office*

12:30 PM      Lunch (on your own)

1:30 PM

### TOOLS FOR INVESTIGATIONS

#### **National Fire Protection Association (NFPA): NIST's Role in Code and Standard Development**

- Daniel Madrzykowski, Fire Protection Engineer, Fire Research Division

#### **Analysis of Fire Patterns Using Computer Simulations**

This project involves the development of tools for conducting a fire investigation following the scientific method. These tools include documented fire experiments to be used to explain a variety of fire phenomena and pattern development and the development and validation of computer models for simulating fire growth and the resulting fire damage.

- Daniel Madrzykowski, Fire Protection Engineer, Fire Research Division

*Moderated by Susan Ballou, Program Manager, Forensics Science, Law Enforcement Standards Office*

2:30 PM      **Poster Session**

3:30 PM

## TOOLS FOR INVESTIGATIONS

### **Mobile Device Testing: Developing Tools for Forensic Examination**

This research project aims to verify the operation and output of automated programs, generally termed tools, used by criminal justice and public safety agencies to examine cell phones and other mobile devices for evidence and to provide documented evaluation for judicial proceedings. To verify the results produced by these tools, NIST was asked to provide expertise in developing test suites and a testing framework to structure the testing of the products in use.

- Richard Ayers, Computer Scientist, Information Technology Laboratory

### **DNA Mixture Interpretation: Aiding the Analysis of Challenging Samples**

Interpretation of mixed DNA profiles represents a major challenge to forensic labs particularly in court largely because approaches to mixture interpretation are varied and far from standardized in the field. In FY2005 we coordinated an inter-laboratory mixture interpretation study and provided over 80 different labs with the same data from several mock sexual assault cases. Lessons learned from this inter-lab study will aid in developing a more standardized approach to mixture interpretation.

- Mike Coble, Forensic Biologist, Biochemical Science Division

*Moderated by Susan Ballou, Program Manager, Forensics Science, Law Enforcement Standards Office*

TUESDAY, DECEMBER 7, 2010

- 9:00 AM     **Opening Remarks – Crime Lab Resources**
- Susan Ballou, Program Manager, Forensics Science, Law Enforcement Standards Office
  - Gerry LaPorte, Program Manager, NIJ

9:15 AM     **INTER-LABORATORY STUDIES**

**NIST-Sponsored Inter-laboratory Studies for the Forensic Human Identity Community: 19 Years and Counting**

The first NIST-sponsored inter-laboratory comparison of DNA measurement technologies was initiated in 1991 as part of the development of the RFLP profiling standard, SRM 2390. Over the past 19 years we have sponsored 10 inter-laboratory studies, addressing many different DNA-related technologies including: STR profiling, DNA quantification, and mixture interpretation. This presentation will focus on the procedural lessons we have learned from these interactions with the forensic human identity community.

- Dave Deuwer, Research Chemist, Biochemical Science Division
- Margaret Kline, Research Biologist, Biochemical Science Division

**The National Ballistics Imaging Comparison (NBIC) Project utilizing SRM 2460/2461: Inter-lab Study**

This project aims to establish a traceability and quality system for nationwide ballistics measurements using SRM Bullets and Casings to ensure the robustness of the network, and aid in the detection of deficiencies prior to the expenditure of time and effort acquiring physical ballistic evidence, that otherwise would have little chance for accurate linking in a database.

- Ted Vorburger, Guest Researcher, Mechanical Metrology Division

**Laboratory Accreditation Aspects & Experience: A NIST Perspective**

- Gordon Gillerman, Director, Standard Services Group

*Moderated by Mark Stolorow, Director, Law Enforcement Standards Office*

10:15 AM    BREAK

10:45 PM    **RESOURCES FOR THE COMMUNITY**

**The NIST National Software Reference Library (NSRL)**

The NSRL collects software from various sources and incorporates file profiles computed from this software into a Reference Data Set (RDS) of information. The RDS is used by law enforcement, government, and industry organizations to automatically review files on a computer. This reduces much of the effort involved in determining which files are important as evidence on computers or file systems that have been seized in investigations.

- Doug White, Computer Scientist, Information Technology Laboratory

**Computer Forensic Reference Data Sets (CFReDS) Project**

This project involves the development of reference data sets (CFReDS) to provide investigators with documented sets of simulated digital evidence for examination. Investigators can use CFReDS in several ways including validating the software tools used in their investigations, equipment check out, training investigators, and proficiency testing of investigators as part of laboratory accreditation.

- Jim Lyle, Computer Scientist, Information Technology Laboratory

**STRBase Updates**

STRBase is an internet information resource on DNA short tandem repeat (STR) markers used in forensic DNA analysis that has been maintained at NIST since 1997. The presentation will illustrate the type of information contained in STRBase and how it might serve as a model for sharing information in other forensic disciplines.

- John Butler, NIST Fellow & Applied Genetics Group Leader, Biochemical Science Division

*Moderated by Shannan Williams, Associate (Contractor), Forensic Science Program, Law Enforcement Standards Office*

12:00 PM Lunch (on your own)

1:30 PM

### SCIENCE HITTING THE COURTS

#### **DNA Research Impacting the Courts: NIST Kinship Analysis and Low Template DNA (LT-DNA) Analysis**

*Low Level.* The importance of determining the lowest amount of DNA that can be reliably analyzed to give a full profile and the comparison of data between three commercial multiplex short tandem repeat (STR) kits will be discussed, as well as the value and relevance to the forensic community. In addition, studies have been conducted to evaluate different methods for low template DNA analysis including replicate testing and enhancing the signal by increasing the number of PCR cycles. The results of these studies will be shown.

*Kinship.* A study is being conducted to evaluate the effect of adding autosomal STRs to the 13 U.S. core loci and the 12 European core loci for complex kinship analysis. Additional genetic information may increase likelihood ratio values for true relationships in a pedigree, while reducing the chance of identifying false relationships. In missing persons and immigration testing, clear discrimination of true versus false relationships is important for these complex kinship cases.

- Kristen Lewis O'Connor, NRC Postdoctoral Fellow
- Carolyn (Becky) Hill, Research Biologist, Biochemical Science Division

#### **Fire Dynamics Simulator (FDS) Project**

This presentation will discuss the Fire Dynamics Simulator (FDS), a computational fluid dynamics (CFD) model of fire-driven fluid flow. The software solves numerically a form of the Navier-Stokes equations appropriate for low-speed, thermally-driven flow, with an emphasis on smoke and heat transport from fires.

- Daniel Madrzykowski, Fire Protection Engineer, Fire Research Division

*Moderated by Melissa Taylor, Management and Program Analyst, Forensic Science Program, Law Enforcement Standards Office*

2:30 PM **Poster Session**

3:00 PM

### DETECTORS

#### **ABI 3500 Studies**

A new genetic analyzer called the ABI 3500 has been recently released to the forensic community for DNA analysis. NIST has purchased one of these instruments to increase our workflow in the Applied Genetics Group. Before the purchase of this instrument, its capabilities were tested using one at AFDIL. The results of those studies will be discussed in this presentation

- Carolyn (Becky) Hill, Research Biologist, Biochemical Science Division

#### **Ion Mobility Spectroscopy Evaluation for Drug Identification**

- Jennifer Verkouteren, Physical Scientist, Surface and Microanalysis Group

*Moderated by Robert Thompson, Program Manager, Forensics Science, Law Enforcement Standards Office*

WEDNESDAY, DECEMBER 8, 2010

- 9:00 AM      **Opening Remarks – Outreach**
- Robert Thompson, Program Manager, Forensics Science, Law Enforcement Standards Office

9:25 AM

#### PRODUCT EVALUATION

##### **Standardizing the Most Widely Used Tool in Forensic Science: The American Board of Forensic Odontologists' #2 Ruler**

In response to concerns regarding the accuracy of forensic photo scales, the Engineering Metrology Group at NIST studied the conformance of commercially available forensic rulers. The speaker will present the results of this study and discuss potential methods for the development of a quality assurance program for forensic photo scales.

- Massimiliano Ferrucci, Physicist, Mechanical Metrology Division

##### **FTA vs 903 paper: Recovering STR typeable DNA**

FTA and 903 are two high-purity cotton linter pulp specimen collection papers. FTA was designed to lysis cells on contact and bind the DNA to the paper while 903 acts as a support media for the dried sample. The long term stability of bloodstains on both media with respect to recovering STR typeable DNA has been study and will be presented.

- Margaret Kline, Research Biologist, Biochemical Science Division

##### **The NIST Computer Forensic Tool Testing (CFTT) Project**

Law enforcement agencies and organizations investigating crimes involving computers routinely use several different automated tools to assist in various inquiries. Often, these tools create critical evidence in criminal investigations. The Computer Forensics Tool Testing Project (CFTT) creates standards by which these tools must adhere to produce valid results.

- Jim Lyle, Computer Scientist, Information Technology Laboratory

*Moderated by Melissa Taylor, Management and Program Analyst, Forensic Science Program, Law Enforcement Standards Office*

10:30 AM      Break

10:45 PM

#### WORKING GROUPS AND RELATED PROJECTS

##### **Addressing the Challenges of AFIS Interoperability: The Latent Print AFIS Interoperability Working Group**

Recognizing that latent print interoperability involves more than just technology, criminal justice agencies must also coordinate and resolve other critical elements, such as training, governance, usage and standard operating procedures. The objective of this working group is to improve latent print AFIS interoperability by developing a clear understanding of the issues and challenges to latent print AFIS interoperability and to identifying collaborative ways to actively address this national problem.

- Peter Higgins, Principal Consultant, Higgins & Associates, Intl (HAI)
- Austin Hicklin, Fellow, Noblis

*Moderated by Melissa Taylor, Management and Program Analyst, Forensic Science Program, Law Enforcement Standards Office*

12:00 PM      Lunch (on your own)

1:30 PM

**WORKING GROUPS AND RELATED PROJECTS**

**Sources of Error in Fingerprint Examination: The Expert Working Group on Human Factors in Latent Print Analysis**

This presentation will discuss the work of this group which will help to illuminate potential sources of error in pattern recognition analysis and lead to the development of guidelines, best practices, and/or standards aimed at eliminating or minimizing identified sources of error as well as identifying future research in the area of quantifying error rates within pattern recognition disciplines.

- Max Houck, Director, Forensic Science Initiative, West Virginia University

**Cognitive Profiles for Latent Examiners: Finding the Right People for the Job**

This presentation will describe research into and uses of cognitive profiles of latent fingerprint examinations.

- Rebecca Bucht, Associate Consultant, Cognitive Consultants International

*Moderated by Melissa Taylor, Management and Program Analyst, Forensic Science Program, Law Enforcement Standards Office*

3:00 PM

**Preserving the Truth: Technical Working Group on Biological Evidence Preservation**

This presentation will discuss the progress of this technical working group charged with creating best practices and protocols to ensure the integrity, prevent the loss, and reduce the premature destruction of biological evidence after collection through post-conviction proceedings.

- Rebecca Brown, Policy Advocate, Innocence Project

*Moderated by Shannan Williams, Associate (Contractor), Forensic Science Program, Law Enforcement Standards Office*

3:30 PM

**Closing**

- Susan Ballou, Program Manager, Forensics Science, Law Enforcement Standards Office