



**3<sup>rd</sup> Conference of the European Division of the  
International Association for Identification**

**October 12<sup>th</sup> and 13<sup>th</sup> 2017**

**Hotel CASA, Amsterdam, The Netherlands**



With the major support of DIAMOND sponsor:



# Welcome to our 3rd conference

## Welcome to the 3rd conference for the European division of the International Association for Identification.

Organising this conference has required teamwork and communication from the Board of Directors who have worked to ensure that everything is in place for this week.

Yet again, the biggest thank you should go to our Vice President, Teresa Wu who has been tireless in her efforts to attract the impressive and highly valued sponsors we have.

Our responsibility is to our members and we have organised a conference with a variety of high calibre speakers who are the best researchers and practitioners in their fields. We hope that you learn from and enjoy the presentations and look forward to feedback from you all.

It is important that as European organisation we ensure that we have a different location every year and give members across the continent the opportunity to attend a first class training experience. The conference is an opportunity to meet others from the continent and share experiences and practice.

The final thank you is to our sponsors who have made this conference possible. Please make sure that you all visit their stands during breaks.

### **EU IAI Board of Directors.**

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# A Message from Our President

## Aldo Mattei



**Hello everyone and welcome to our 3rd divisional conference .**

We are excited to be holding our 3<sup>rd</sup> conference in the beautiful city of Amsterdam and we hope that you have time to explore and enjoy the attractions the city offers.

We are delighted to be able to again welcome so many great sponsors to this event and without their continued support we would not be able to organise and offer this event.

We would also like to thank all of the oral and poster presenters who are willing to share their knowledge and passion for their subjects with us all so that we can increase our knowledge. This organisation is about sharing knowledge and supporting others in the field and we hope that you all take the opportunity network and create relationships with others in your field.

I would like to thank the Board of directors for their efforts in organising this conference and thank the membership for their support.

Please go back to your organisations and tell others about the work we are doing.

I hope that you all enjoy the conference and I look forward to meeting you.

Aldo Mattei

President

The European Division of International Association for Identification

# Special Thanks to Our Sponsors

Without the valued contribution of our sponsors it would not be possible to put on a conference of such high quality. Their contribution has enabled the Board of Directors to select a quality venue, attract top class speakers and also ensure your conference experience is provided at an affordable cost. With heartfelt thanks to our generous benefactors

## DIAMOND SPONSORS



OT-Morpho is now IDEMIA, the global leader in trusted identities for an increasingly digital world, with the ambition to empower citizens and consumers alike to interact, pay, connect, travel and vote in ways that are now possible in a connected environment.

Securing our identity has become mission critical in the world we live in today. By standing for Augmented Identity, we reinvent the way we think, produce, use and protect this asset, whether for individuals or for objects. We ensure privacy and trust as well as guarantee secure, authenticated and verifiable transactions for international clients from Financial, Telecom, Identity, Security and IoT sectors.

With close to €3bn in revenues, IDEMIA is the result of the merger between OT (Oberthur Technologies) and Safran Identity & Security (Morpho). This new company counts 14,000 employees of more than 80 nationalities and serves clients in 180 countries.

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# Silver Sponsors



Foster + Freeman design and manufacture systems for the examination of latent fingerprints, detection and examination of forensic evidence at the crime scene, and in the forensic laboratory. Our product range includes advanced systems for the development of fingerprints using traditional time honoured methods alongside exclusive new and novel techniques. The Crime-lite range of forensic light sources offer high intensity LED illumination.



BVDA International focuses on the development and production of products for use in forensic departments of the police, forensic institutes, government investigation agencies, forensic service providers and educational institutions. BVDA manufactures a wide range of products exclusively for forensic applications. Made in our chemical labs, readymade reagents and dyes for the visualization of (latent) marks, fingerprint powders and silicone materials for casting tool marks and lifting of powdered fingerprints are supplied to customers worldwide. BVDA is probably best known for its GELLIFTERS and the GLScan systems, high-end imaging systems ensuring the ultimate result when imaging marks on Gellifters.

## Bronze Sponsors



BLUESTAR® FORENSIC is the latent blood reagent most widely used in the world by crime investigators, to reveal blood that has been washed out, wiped off or is invisible. Based upon chemiluminescence, its unique formula does not alter the DNA. It is safe and easy to prepare and use.



Integrated Biometrics provide innovative enrollment and verification fingerprint sensors to hardware integrators, software and database providers, and contractors serving government agencies and commercial markets worldwide. Integrated Biometrics products utilize our patented LES (light emitting sensor) film delivering best-in-class performance in speed, size, weight, ease of use, and durability for affordable high performance mobile solutions.



JENETRIC are experts in digital fingerprint capturing technology. We develop and manufacture biometric sensors that meet the highest demands for image quality, capture speed and ease of use. Our solutions take a holistic approach to design. We not only focus on technical parameters but on measurable efficiency in terms of performance and the noticeable improvement for users and agencies. Our fingerprint scanners LIVETOUCH quattro and LIVETOUCH quattro Compact represents a new class of compact and user friendly devices that will help simplifying and improving fingerprint capture process.



CST has developed and markets since 2013, LUMICYANO: the first one step fluorescent cyanoacrylate fuming process used for the development of latent fingerprints, a deemed revolutionary process. It is already adopted by several scientific Police departments around the world including French, German, Chinese and US Police labs. In addition, Lumicyano was subject to several scientific communications.



## 3rd Conference of the European Division of the International Association for Identification

October 12<sup>th</sup>-13<sup>th</sup> 2017 at Hotel CASA, Amsterdam, Netherlands

**THURSDAY 12th OCTOBER 2017**

- 0815            Registration Opens
- 0900            **Presidents Welcome**  
Aldo Mattei, EUIAI President

### **MAIN SESSION - Location**

- 0915 - 1000    **Keynote Speaker**  
Professor Pierre Margot, University of Lausanne
- 1000 - 1030    **Developments in Forensic Face comparison**  
Arnout Ruifrok, Netherlands Forensic Institute
- 1030 - 1100    **'A new method to recover important chemical components after  
fingermark collection'.**  
Annemieke van Dam – UvA
- 1100 -1130    **BREAK**  
**Vendors displays**
- 1130 - 1200    **'Understanding silver nucleation and growth in the physical developer  
process for latent fingermark visualisation'**  
Professor Rob Hillman, University of Leicester
- 1200 – 1230    **'AFIS next evolution: Latent Automation and Altered Fingerprint'.**  
Scott Swann, CEO IDEMIA National Security Solution
- 1230 - 1300    **INTERPOL Fingerprint and Face databases – their role in the  
identification in the international environment**  
Zuzana Descikova, Interpol
- 1300 - 1400    **LUNCH**

- 1400 – 1430 **‘Aiding the interpretation of Forensic Gait analysis: Development of a features of gait database’.**  
Professor Ivan Birch, Sheffield Teaching Hospitals NHS Foundation Trust
- 1430 -1515 **PANEL DISCUSSION - ERROR RATES – ALDO MATTEI**
- 1515 - 1545 **BREAK**  
**Vendors’ displays**
- 1545 - 1615 **‘Functionalised silica nanoparticles for latent fingerprint development’**  
Adam Lesniewski - Institute of Physical Chemistry, Polish Academy of Sciences
- 1615 – 1645 **‘A Pre-Validation Study of a New Forensic Technology for Fingerprint Visualisation’**  
Alex Smyth, University of Leicester
- 1645 **Close of day**

Vendor displays and Poster presentations available all day

**WORKSHOP SESSIONS - €35 fee per session max. 30 students per session**

**Room 2**

- 1400-1700 **Reducing Erroneous exclusions**  
Eric Ray, University of Arizona

**1900-2300 Banquet Dinner, CASA hotel**



## FRIDAY 13th OCTOBER 2017

### MAIN SESSION – Location

- 0900 Introduction
- 0915-1000 **‘Sufficiency for exclusions’**  
Eric Ray
- 1000 - 1030 **‘Old vs New International Fingerprint Data exchange’**  
Michaela Spankova Slovakia Forensic Institute
- 1030 - 1100 **BREAK**  
**Vendor displays**
- 1100 - 1130 **‘The probability of Forensic Likelihood ratios’**  
Anthony Laird, National Bureau of Identification, Finland
- 1130 – 1200 **‘Introduction of a new AFIS: ACE\_V, Validation and other weird stuff’**  
Kurt Aebersold
- 1200 - 1300 **EU IAI members Annual General meeting (mandatory for EU IAI members)**
- 1300 - 1400 **LUNCH**
- 1400 - 1430 **‘Hide and Seek’ development and visualisation of fingermarks on leather’**  
Leisa Nichols Drew (De Montfort University)
- 1430 - 1500 **‘Finding the optimum to improve chances for identification; sample preparation and DNA extraction from (compromised) bone’**  
Tristan Krap, UvA
- 1500 – 1530 **BREAK**  
**Vendor displays**
- 1530 - 1600 **‘Predict the DNA concentration in fingermarks using the autofluorescence intensity of fingermark residues’**  
Kim Falkena, University of Amsterdam
- 1600 - 1630 **‘A user interface is like a joke. If you have to explain it, it’s not that good.’**  
Yvonne Voedisch, Jenetric
- 1630 **Close of conference**  
Aldo Mattei, EUIAI President

## Conference Presenters

### Keynote Speaker



Professor Pierre Margot

#### **Keynote lecture – ‘One cannot be half pregnant ...or the identification riddle’**

The certainty of identification has been the dogma of fingerprint identification for a long time. Practice had forgotten the discussions of the pioneers and until recent realisation that the error rate was not nil and the final attacks by the NAS report in the USA. How many times have I heard ‘One cannot be half pregnant’ when discussing the identification process in the 1990’s and early 2000’s? Have we reached term? A small review of the riddle will be developed.

Professor Pierre Margot fell early in the cauldron of forensic science by obtaining a combined degree in forensic science and criminology at Lausanne University, Switzerland, in 1974. A short spell in the UK attracted him to pursue an MSc degree followed by a PhD degree in forensic science at Strathclyde University in Glasgow. Postdoctoral research led him from Salt Lake City (USA) in forensic toxicology at the Center for Human Toxicology (University of Utah), to the Federal Institute of Technology (EPFL) in Lausanne (research in chromatography) and to the Australian National University in Canberra (Australia) to pursue research and development in dactyloscopy (fingerprints). He was then called to take the professorial position in 1986 in Lausanne. He is the 4th professor occupying the first academic chair in forensic science, created in 1909 at the University of Lausanne. One of his major contribution is to have created a research centre where over 70 PhD theses have been completed in the last 20 years and a full commitment to develop further this discipline as a key actor of forensic intelligence, investigative science and in providing solid and measurable evidence in court. His group has published over 220 peer-reviewed papers in forensic science within the last 10 years.

His contributions to forensic science were internationally acclaimed with major awards such as the Douglas M. Lucas Medal of the American Academy of Forensic Sciences, a doctorate honoris causa at the University of Québec in Trois-Rivières (Canada), accession to the French speaking Pantheon of criminalistics, ENFSI (European Network of Forensic science) contributor award and more recently the John Dondero Award of the International Association for Identification (IAI). Pierre Margot is associate editor of Forensic Science International, the major scientific journal in forensic science and co-author of the book “Fingerprints and Other Ridge Skin Impressions” 2nd edition CRC Press 2016.



Eric Ray

**Lecture – ‘Sufficiency for Exclusions’**

**Workshop – ‘Reducing Erroneous Exclusions Workshop’**

Eric Ray has been employed as a Forensic Scientist since 2007 and is a Certified Latent Print Examiner. He earned a BS in Biochemistry and Molecular and Cellular Biology from the University of Arizona in 2000. As a member of the IAI, Eric is on the Editorial Board of the JFI. Eric has published and presented extensively on the exclusion decision in latent print comparison. In his spare time he also co-hosts the Double Loop Podcast, a weekly show on fingerprint topics.

### **Lecture – ‘Sufficiency for Exclusions’**

The exclusion decision has long been an overlooked part of the latent print examination process. It is not merely the simple opposite of the Identification decision, but must be studied independently to determine its utility, an acceptable level of accuracy, how to measure sufficiency, and when it is an appropriate decision to reach.

This lecture will discuss the exclusion decision and its relation to the “One Discrepancy Rule”, accuracy, anchor points, levels of detail, cyclical examination, an hypothesis testing. To improve accuracy and consistency the latent print field must reach a consensus on the type and amount of information that constitutes sufficiency for Exclusion.

### **Workshop – ‘Reducing Erroneous Exclusions Workshop’**

The exclusion decision is a fairly recent change in the latent print comparisons, and the discipline is still struggling with how to handle exclusions. Erroneous exclusions are being discovered with surprising frequency in latent print units around the country. Many labs have begun to verify their exclusion decisions, and this has resulted in errors finally being noticed. Recent research into the decisions of latent print examiners shows that erroneous exclusions are common and inevitable.

So, what training have you had in exclusions? What is enough for an exclusion? What is your lab’s standard for exclusion? Is your lab implementing any new Quality Assurance policies to address this problem?

This workshop will review the policy changes that Arizona DPS has implemented in their latent print unit to reduce erroneous exclusions. Examples of erroneous exclusion from casework will be presented along with information on the circumstances that might make an erroneous exclusion more likely. Hands-on comparison exercises will demonstrate a practical approach to exclusion decisions.

This class is intended for latent Print examiners who routinely conduct comparisons.



B. Scott Swann, President and CEO of IDEMIA National Security Solution

**'AFIS next evolution: Latent Automation and Altered Fingerprint'**

B. Scott Swann is the President and CEO of IDEMIA National Security Solution. This subsidiary provides biometric products and services to leading federal government agencies. Mr. Swann previously served as the Vice President of Federal Operations and Innovation at MorphoTrak, LLC, where he was responsible for delivering biometric and security solutions for customers including the FBI, DHS, DoD, and many other state and local law enforcement and civil agencies. Mr. Swann joined MorphoTrak, after serving as Special Assistant in the FBI Director's Office to the Executive Director of the Science and Technology Branch. Mr. Swann entered duty with the FBI's Criminal Justice Information Services (CJIS) Division in 1996. In 1998, he was assigned to the Integrated Automated Fingerprint Identification System (IAFIS) Program Office and worked as an engineer ensuring the integrity of FBI IAFIS repositories. He was also involved in several technology refreshments of the FBI CJIS System-of-Services. As a Unit Chief for the Services, Evaluation & Analysis (SEA) Unit between 2008 and 2010, Mr. Swann was responsible for directing, coordinating, and administering research, development, test and evaluation of biometrics technologies and services to support the Next Generation Identification Program. In 2010, Mr. Swann accepted a joint duty assignment with the Office of the Director of National Intelligence (ODNI), where he served as an Executive Officer and Science and Technology Office as the Identity Intelligence Lead for the Intelligence Community (IC). As part of his 18 year tenure with the FBI Mr. Swann was an active member of the International Association for Identification and also served as the FBI Agency Primary representative to the National Science Technology Council Subcommittee on Biometrics and Identity Management as well as Chairperson for the Department of Justice Biometric Cooperative. Mr. Swann is a certified project management professional through the Project Management Institute. He holds an undergraduate degree in business management from Salem-Teikyo University and a Master of Science degree in software engineering from West Virginia University.



Dr Adam Leśniewski

**'Functionalised silica nanoparticles for latent fingerprint development'**

Dr Adam Leśniewski gained an MSc in Chemistry from the University of Warsaw in 2006. During his master studies he was working on glass fragments origin identification based on analytical data of known samples obtained by SEM-EDS and LA-ICP-MS. In

2010 he obtained a PhD with honours in Physical Chemistry from the Institute of Physical Chemistry of the Polish Academy of Sciences. During his PhD studies he was working on the application of sol-gel materials in electrochemistry. He did his postdoc at the Hebrew University of Jerusalem working on utilization of gold nanoparticles for latent fingerprints development. For this work he was awarded, together with his co-workers, by the Israel Analytical Chemistry Society with the Jehuda Yinon Award. Currently he is a research associate in the Institute of Physical Chemistry, PAS. He is working on silica based organic-inorganic materials for latent fingerprints development.

Anthony Laird

**'The probability of Forensic Likelihood ratios'**

Anthony (Tony) began his career in forensic examination as a fingerprint examiner in 1986 at the then, South West Regional Fingerprint Bureau in Bristol, UK. He transferred to the Finnish National Bureau of Investigation Fingerprint Department in 1992. Tony has been responsible for the recruitment and training of many of the fingerprint examiners currently working in Finland. He developed a colour coding protocol for fingerprint analysis and comparison published in the Journal of Forensic Identification. He took part in a long term project organised by the University of Helsinki Archaeology Department, examining fingerprints found on Stone Age clay pot shards. In addition to fingerprint examination, Tony recently spent some time working in the National Bureau of Investigation tool mark and shoe print department. Tony is a Certified Latent Print Examiner (IAI); he holds a BSc (Hons) in Sociology and Social Policy, an MSc in Criminology and Criminal Psychology and is currently working towards a doctorate in Criminal Justice with the University of Portsmouth in the UK.



Professor Ivan Birch

**'Aiding the interpretation of Forensic Gait analysis: Development of a features of gait database'**

Professor Ivan Birch is Consultant Expert Witness in forensic gait analysis with Sheffield Teaching Hospitals NHS Foundation Trust and Emeritus Professor of Human Sciences. Ivan graduated in 1978 with a BSc Joint Honours in Science from the University of Salford, gained an MSc in Human Biology from the University of Loughborough in 1980, and was awarded a PhD in Biomechanics by the University of Brighton in 2007. He has extensive experience of teaching biomechanics, anatomy, physiology and research methods, and is a Professional Member of the Chartered Society of Forensic Sciences, an

accredited forensic practitioner in forensic gait analysis, and holds the society's certificate of professional competence in this area of practice. In 2015 he was awarded the status of the Chartered Scientist by the Science Council and College of Podiatry in the UK for his work in forensic gait analysis. Ivan is included on the National Crime Agency Specialist Operations Centre Expert Witness Advisers Database in the UK, and has more than 35 years' experience of gait analysis.



Arnout Ruifrok, Netherlands Forensic Institute

**'Developments in forensic face comparison'**

Arnout C. C. Ruifrok, received his M.Sc. in Biology from the University of Groningen, the Netherlands, in 1982. In 1987 he received his Ph.D. in Mathematics and Natural Sciences from the University of Groningen. From 1987 to 1992 he was involved with medical research projects in Rotterdam and Nijmegen, where he got his first exposure to image analysis. In 1992 he moved to Houston, TX, Department of Biomathematics, M.D. Anderson Cancer Center. During his employment at the Department of Biomathematics he became involved in image analysis and pattern recognition. From 1999 to 2002 he joined the Department of Pathology, M.D. Anderson Cancer Center, working on automated recognition and classification of cancer cells. In 2002 he joined the Netherlands Forensic Institute (NFI) group for Image analysis and Biometrics. In this group his main responsibilities were research into the possibilities of use of biometric features in forensic identification, forensic applications of biometric systems, and facial comparison. After a 4 year period in a management position, in 2016 he became Senior Scientist in the division Digital and Biometrics Traces in the team Forensic Biometric Traces, returning to forensic casework and research into the possibilities of the use of biometric features in forensic identification, forensic applications of biometric systems, especially facial comparison.



Professor Rob Hillman, University of Leicester

**'Understanding silver nucleation and growth in the physical developer process for latent fingerprint visualisation'**

Robert Hillman was educated at Imperial College London (BSc, 1976) and Oxford University (DPhil, 1979). After post-doctoral research at Imperial College, he was appointed to a Lectureship at the University of Bristol (1983), to the Chair of Physical Chemistry at the University of Leicester (1992), and as Dean of the Faculty of Science (2003-2009). He was Scientific Editor of Faraday Transactions and Faraday Discussions

(1994-1997) and has been Editor in Chief of *Electrochimica Acta* since 2014. Robert has served the International Society of Electrochemistry as UK National Secretary (1994-1998), Secretary General (1999-2005), Chair of the Scientific Meetings Committee (2006-07) and President (2009-2010). His research interests are in the fields of interfacial electrochemistry, electroactive materials and the analysis and imaging of thin surface films. Since interfaces are where material transfers occur upon contact between objects, this has recently motivated study of the interfacial science associated with fingerprints. In particular, redox processes associated with metals and polymers are being used to visualize latent fingermarks on diverse surfaces, from metals to paper, of relevance to both acquisitive and violent crimes.



Michaela Spankova, Institute of Forensic Science

**'Old vs New International Fingerprint Data exchange'**

Michaela Spankova works for the Institute of Forensic Science. She started as a Fingerprint Laboratory Assistant and since 2012 has worked as a Fingerprint Expert at Fingerprint Department.

Between 2005 – 2010 Michaela completed her Bachelor's and Master's studies in Security at University of Zilina with part of Master's studies at Windesheim University, Zwolle, The Netherlands. In 2012 she studied Investigation and Law at Academy of Police Force, Slovakia. Since 2012 she has studied postgraduate studies at Academy of Police Force and is now a Philosophiae Doctor (PhD.) candidate.



Annemieke van Dam

**'A new method to recover important chemical components after fingerprint collection'**

Annemieke van Dam obtained her BS degree in Biomedical Sciences at the University in Utrecht from which she graduated in 2008. Hereafter, she completed the Master Forensic Sciences at the University of Amsterdam in Amsterdam in 2010. Her graduation project was performed at the department of Biomedical Engineering & Physics at the Academic Medical Centre (AMC) in Amsterdam, the Netherlands with the topic 'visualization of fingermarks by specific labelling with antibodies'. After graduating she starting working at the same department as a PhD student of which she graduated in 2014. Here, she developed techniques that aid in the detection, analysis and identification of components present in fingermarks using immunolabelling. Furthermore, she developed a method to estimate the age of latent fingermarks based on fluorescence spectroscopy. Currently, she is working as a postdoctoral researcher at the AMC, the Netherlands on the following topics: the specific detection of components

using immunolabelling in fingermarks and other contact traces for forensic and medical purposes and further develop the age estimation method of fingermarks and other body fluids, including semen, urine and saliva.



Leisa Nichols Drew, De Montfort University

**“Hide and Seek’ development and visualisation of fingermarks on leather’**

In 2000, first class undergraduate honours in Biomedicine preceded a career at the UK Home Office Forensic Science Service as a Senior Forensic Scientist Examiner within the discipline of Forensic Biology. Assigned as a Lead Examiner for coordinating the laboratory strategy for complex major crime investigations such as armed robberies, missing persons, sexual offences, homicides and cold case reviews. Other roles included: Technical Trainer, Auditor, Body fluids Representative, Quality Focus Champion and the requirement for attendance at crime scenes and court.

Subsequently, a tripartite portfolio career commenced. Firstly, an academic career at De Montfort University in Leicester on the accredited forensic science degree course. Secondly, the consultancy Forensic Select for laboratory design, quality issues, media enquiries and practitioner related research interests. Thirdly, the utilisation of practitioner skills at Cellmark Forensic Services maintains essential evidential competencies. Furthermore, engagements with the Chartered Society of Forensic Sciences have involved industry assessing, committee representation and conference convening.

A personal interest is continual professional development via professional society memberships, attendance at case study lectures, exhibition events, workshops and training courses. Additionally, oral and poster presentations have been delivered at multiple national conferences and international symposiums (New Zealand, Europe and Canada). Successful completion of an MSc Forensic Science and Criminal Justice (Distinction) at the University of Leicester, included the graduation award for Best Student Performance.

Forensic science has always been a lifelong passion and it remains a privilege to continue working in this field. Ultimately, it is an absolute honour to be invited to present at the 3rd IAI European Division conference in Amsterdam.





Zuzana Descikova, Interpol

**'INTERPOL Fingerprint and Face databases – their role in the identification in the international environment'**

Zuzana Descikova is a senior fingerprint examiner at Fingerprint Unit in INTERPOL Secretariat General, Lyon.

She received her BSc. In Biology and M.Sc. in Anthropology from Comenius University Bratislava and after completing her studies started to work as a fingerprint expert at Institute of Forensic Science in Bratislava, Slovakia.

During her six-year career there as a certified forensic expert in the field of dactyloscopy she was representing Slovakia as a National expert for fingerprints in ENFSI Fingerprint Working Group and EU Working Party on Information Exchange and Data Protection (DAPIX).

She joined INTERPOL in 2012 and continues to expand her experiences in the field of fingerprint examination, biometrics, police training and international police cooperation. In 2016 she spent six months in Singapore in the position of INTERPOL's regional forensic examiner. Her role during this period was to evaluate the current status of police forensic sciences in the Southeast Asia region, especially in the fields of Fingerprints, Facial recognition, DNA, DVI and Ballistics, prepare the trainings and specialized meetings and compile the INTERPOL ASEAN Forensic Capabilities report.

She can be contacted at [z.descikova@interpol.int](mailto:z.descikova@interpol.int).

Kurt Aebersold, Head of Section AFIS 1, Bern.

**'Introduction of a new AFIS: ACE\_V, Validation and other weird stuff'**

Kurt is the head of the section AFIS 1: Person Identification of the division AFIS DNA Services, Federal office of the Police Switzerland. In his capacity as a manager, he is in charge of the procedures regarding the FASTID and tenprint requests. He also supports the team in the daily task of processing tenprints and latents. On a national level, he is a member of the professional group for police records (TP, mugshots, etc.) and was a member of the expert group for the current AFIS.

Kurt holds a Masters of Forensic Sciences from the Ecole des Sciences Forensiques, University of Lausanne, Switzerland, and the degree of a national fingerprint expert. He is a member of the INTERPOL AFIS Expert working group and the IAI. Prior to his employment at the national AFIS, he worked as a criminalist in the Crime Scene Unit in the Police Force of Canton Zug.



Alex Smyth, University of Leicester

**'A Pre-Validation Study of a New Forensic Technology for  
Fingermark Visualisation'**

Alex graduated with an M.Sci. in Oceanography from the University of Southampton (United Kingdom) in 2010. After graduating, Alex moved to Australia and worked for an environmental consultancy in Cairns, before moving back to Europe to work as a researcher in Atmospheric Physics and Chemistry at the University of Malta in 2011. In 2014 Alex obtained an M.Sc. in Atmospheric Physics from the University of Malta. In October 2014 Alex started a Marie Curie Early Stage Researcher Fellowship Ph.D. at the University of Leicester (United Kingdom) in Physics as part of the INTREPID Forensics Program. The aim of the Ph.D. is to use novel physical techniques typically used in astrophysics and astrobiology to detect fingermarks on surfaces subjected to extreme conditions, with a focus on detecting fingermarks on fragments of IEDs and debris post-blast.



Kim Falkena

**'Predict the DNA concentration in fingermarks using  
the autofluorescence intensity of fingermark residues'**

Kim studied the bachelor Biomedical Sciences in Utrecht and the master of research Forensic Science in London. She performed her internship at the Academic Medical Center (AMC) in Amsterdam at the department Biomedical Engineering and Physics. She graduated in 2016 on the topic she is presenting today and continued with it during my job as Forensic analyst.



Tristan Krap

**'Finding the optimum to improve chances for identification; sample preparation and DNA extraction from (compromised) bone'**

Graduated in Physical Anthropology, at Leiden University, Tristan Krap combined his study with Forensic Science in Amsterdam. In addition to drawing up a biological profile based on skeletal remains, he also has experience with human remains in various stages of decomposition. Further he works as a senior lecturer and is a PhD-candidate at the University of Maastricht in collaboration with the Academic Medical Centre in Amsterdam (University of Amsterdam).

His research focuses on decomposition, estimating the postmortem interval, and on the analysis of thermally altered human (skeletal) remains.



Yvonne Voedisch, Jenetric

**'A user interface is like a joke. If you have to explain it, it's not that good.'**

Yvonne Voedisch is Director Sales at JENETRIC. Yvonne holds engineering degrees in IT systems-engineering and industrial engineering. Having spent 12 years in the biometrics industry, she gained extensive knowledge on multiple enrolment technologies, best practices and usability requirements. Yvonne held various sales and partner & alliances positions at Smiths Heimann Biometrics and Crossmatch before joining JENETRIC in 2015.

## **Poster Presentations**

### **Spherical Silica Particles as Luminescent Markers For Latent Fingermarks Detection**

Izabela Olszowska M. Sc., Adam Leśniewski Ph.D. , Joanna Niedziółka-Jönsson Associate Professor  
Institution: Institute of Physical Chemistry, Polish Academy of Sciences, Warsaw

Among various techniques, latent fingermark visualization based on luminescent imaging including powder dusting, vacuum cyanoacrylate fuming, amino acid reagent treatment, dye staining and more has become an utilizable tool for fingermarks detection in recent years [1]. Despite a great number of optical techniques, there is still a challenge to visualize latent fingermarks with high contrast and low background interference on both porous and non-porous surfaces characterized by strong background luminescence [2]. The effective method of fingermark visualization employing long-persistent luminescence of the material is time-resolved imaging [3]. Using this technique involves applying the bifunctional agent which possesses the optical properties and selectively covers the fingermark ridges at the same time. The appropriate material that gives desirable selectivity and effective separation from the background luminescence are silica nanoparticles (NPs) [4].

The refined approach to time-resolved technique of latent fingermarks development on luminescent non-porous and porous surfaces is based on the composite organic-inorganic NPs which give the delayed fluorescence or phosphorescence and selectively interact with fingermark constituents at the same time. The technique includes luminophore immobilization into the silica matrix via sol-gel synthesis and concurrently modification of the silica particles' surface with organic agents so that they preferentially attach to the fingermark residue. Several interactions between fingermark residue and luminescent silica NPs have been studied. Thiol-gold interactions were examined between silica NPs modified with thiol groups and gold nanoparticles deposited on fingermark ridges via single metal deposition and multi-metal deposition [5]. Also lipophilic interactions between sebaceous components of fingermark residue and silica NPs modified with long carbon chains or phenyl groups were tested. Finally, amide bond formation between amine groups present in fingermark residue and silica NPs functionalized with carboxyl groups was investigated. Fingermarks were deposited on non-porous and porous surfaces including glass, aluminium, PE foil and paper.

Luminescent silica NPs based on rare earth chelates or quantum dots seem to be promising material having several advantages. Primarily, high resolution is obtained due to the small particle size. Secondly, silica NPs integrated with luminophore can possess luminescent properties in a wide range of the electromagnetic radiation. Finally, modifying the surface of silica NPs with various chemical agents leads to their interaction with specific constituents of fingermark residue and, in turn, increases selectivity.

## **Rigorous study of Fingermark recovery using a Scanning Kelvin Probe**

Prof. Iain D. Baikie <sup>1</sup>, Miss. Susanna E. Challenger <sup>1</sup>, Detective Chief Superintendent (retired) Gary Flannigan <sup>2</sup>, Detective Constable Stephen Halls <sup>2</sup>, Mr. Kenny Laing <sup>3</sup> A.M.Scott <sup>4</sup>

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Traditional techniques to recover latent fingerprints from metallic surfaces do not consider the metal surface properties. The Scanning Kelvin Probe (SKP) recovers latent fingerprints best, in an energy map of the surface, from metallic surfaces without further enhancement techniques, under ambient conditions. As a non-contact, non-destructive technique, SKP does not prevent subsequent forensic analysis. The Contact Potential Difference (CPD) change was used to recover fingerprints from a variety of flat Brass, Iron and Copper metal surfaces. Further instrumentation was developed to allow rotational SKP scans to record fingermarks on an Iron Rod and a Brass cartridge cleaned post firing. The measurement configuration was optimised to undertake scans within a stable relative humidity and temperature environment to prevent natural atmospheric deviations from adversely impacting the resulting fingerprint images. The quality of the fingermark images produced using SKP is high and the ID point recovery was equivalent to the same area fingerprint shown in ink on paper. The data quality is sufficient to recover 1st, 2nd and 3rd level detail. The Scanning Kelvin Probe latent fingermark recovery technique provided on average over ten 2nd level detail ID points per planar sample and 30 ID points were found between a thumb and forefinger print on the Brass Cartridge. The contact fingerprint area available on a cartridge is reduced but the number of ID points found was consistent with the same area on the planar scan and there is the opportunity to recover two prints from the cartridge surface area. Ten different donors were used as test-subjects. The ridge contrast for most participants was  $50 \pm 10$  mV on Brass and Iron planar surfaces but one of the donors had a much greater CPD contrast of  $85 \pm 5$  mV. A fingermark on a flat Brass surface was rescanned 5 months after initial placement; there were originally nineteen 2nd order ID points detected and all nineteen were present when rescanned so there was no detrimental impact on the ID information. This is the first time a rigorous study of SKP fingermark recovery using a variety of different donors has been performed. Results obtained were very encouraging and suggest that the Scanning Kelvin Probe technique could have a place as a first stage analysis tool in serious crime investigation.

## **Recovery of Fingermarks from Metallic Surfaces using a Scanning Kelvin Probe**

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Latent fingerprint evidence is a significant tool used to provide a means of potentially identifying individuals in criminal investigations. Traditional techniques to recover latent fingerprints from metallic surfaces do not consider the metal surface properties and instead focus on the fingerprint chemistry. The Scanning Kelvin Probe (SKP) technique is a non-contact, non-destructive method, used under ambient conditions,

which may be utilised to recover latent prints from metallic surfaces and does not require any enhancement techniques or prevent subsequent forensic analysis. SKP may be used to record a volta potential map of the surface by contact potential difference (CPD) measurements with a resolution of the probe diameter (50 – 300 µm in this study). Where a fingerprint ridge contacted the metal, the CPD contrast between the background surface and the fingerprint contact area was 10 - 50 mV. This CPD change was used to recover fingerprints from flat Brass, Nickel, and Copper metal surfaces. Scanning Electron Microscope (SEM) scans were used to identify the fingerprint contact areas through Sodium, Chlorine and Oxygen EPMA. The fingerprint can also be observed in the backscattered electron image as the carbon deposits from the fingerprint scattered the electrons less than the surrounding metal surface. Additionally, for the Copper sample, the fingerprint is shown clearly in a Cathodoluminescence scan as it blocks the photon emission at band gap (2.17 eV) from the underlying Copper Oxide (Cu<sub>2</sub>O) surface. Measurements were performed on the untreated metal surfaces and compared to traditional forensic enhancement techniques such as vacuum metal deposition (VMD) using Au-Zn and Au-Ag. Using VMD, the CPD change ranged from 0 - 150 mV between the dissimilar metal surfaces affected by the fingerprint. In general, SKP worked best without additional enhancement techniques. Results obtained were very encouraging and suggest that the Scanning Kelvin Probe technique, which does not need vacuum, could have a place as a first stage analysis tool in serious crime investigation.

### **My approach is better than yours, damn right? Differences between numerical and holistic approaches when carrying out a fingerprint task.**

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Fingerprint evidence within forensic Science has been used to identify individuals for more than 100 years within the legal system (Cole, 2002). However, Barnes (2011) stated that the possibility of *“friction ridge skin impressions were used as a proof of a person’s identity in China perhaps as early as 300 B.C., in Japan as early as A.D. 702, and in the Unites States since 1902”* (pp.1).

To so the exam of fingerprints, this work-field started to organise the structure of minutiae in three different levels – level 1. Level 2 and level 3 of minutiae details (NIST, 2012), and started to carry the official process, so called ACE-V.

However, fingerprint bureaus do not share a standard approach to carry the work that examiners need to carry. There are two main approaches that have expression at a European level, the numerical and the holistic approaches.

What is the most accurate approach to use within a bureau?

The authors built an experiment to mimic a fingerprint examination task which was applied within 20 forensic bureaus worldwide (n=67) that worked at the time either within a numerical or holistic approach. Results promote the reflection on the approach that is thought to be the most accurate as well as the guidelines that need to be used after official reports have been released (e.g. NAS report, FSR guidelines, PCAST report).