Dear Participant,

Welcome to this Royal Society meeting **The paradigm shift for UK forensic science** organised by Professor Sue Black OBE FRSE and Professor Niamh Nic Daeid.

Royal Society meetings bring together scientists from around the world to present and discuss new research in all areas of the science. Each meeting is organised by leaders in the field, using their expertise to ensure the key topics are covered. The focus on discussion throughout the meeting allows everyone, at any stage of their scientific career, to get involved in the conversation.

Our networking lunch and refreshment breaks will be taken in the City of London Rooms, adjacent to the main lecture hall. If you wish to purchase lunch and have not already done so, you can purchase this from me at the registration desk during the morning break.

Toilets are located on the basement floor, which can be reached using the main staircase by the registration desk, or using the lifts opposite the registration desk.

You are welcome to use our wireless internet, the username is **rsnetwork** and the password is **Newton+apple**. If you would like to tweet about the meeting please do, our handle is **@royalsociety**, and the hashtag for the meeting **#RSforensicscience**.

Throughout the meeting I, or a member of the Scientific Programmes team, will be available to answer any questions you might have at the registration desk where you collected your badge – please don’t hesitate to ask.

We hope you enjoy your time with us, and that the meeting proves productive and enjoyable.

Yours sincerely

Catriona Ross and the Scientific Programmes team

<p>| The Royal Society is committed to accessibility for our events. Our lecture hall is fitted with an induction loop for those who are hard of hearing. | If you hear the fire alarm at any time, it is not a test. Please calmly leave the lecture hall through your nearest fire exit. |</p>
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Synopsis
A paradigm shift is imminent in forensic science as the discipline approaches a pivotal juncture in the modern courtroom. The event will capitalise on an emerging landscape to develop, design and promote a robust, effective and efficient capability that will best serve justice. This event draws upon extensive international experience in change management, forensic science research and judicial influence.

Monday 2 February 2015

9.00 Welcome by the Royal Society & organisers

Session 1: Research in forensic science, beyond the state of the art
Chair: Andrew Miller MP, House of Commons Science and Technology Committee, UK

Andrew Miller was educated in Malta, Hampshire and at the London School of Economics, and holds a Diploma in Industrial Relations. His began his career as a technician in geology at the Portsmouth Polytechnic, where he developed an XRF and XRD laboratory. He then moved into industrial relations and was an official for the Manufacturing, Science and Finance Union where he represented many scientists and engineers working in leading companies from 1977 until he was elected to Parliament in 1992.
As Labour Member of Parliament for Ellesmere Port and Neston, Mr Miller represents just under 70,000 electors. As well as dealing with numerous widely diverse issues at constituency level, Mr Miller is also Chair of the Science and Technology Select Committee; Chair of the Parliamentary & Scientific Committee; Vice-Chair of the Parliamentary Internet, Communications and Technology Forum (PICTFOR) and a Member of the Liaison Committee. Between 1992 and 2001 he was also a member of the House of Commons Information Committee and has served on many other parliamentary committees.
Mr Miller was a Member of the First Steps Team working with the Foreign Office to promote relations with EU and prospective EU member states with specific responsibility for Hungary and Malta and his liaison work with the two countries continues today.
His particular political interests include Communications and Information Technology; Regional Economy; Science and Technology; the Environment and Industry. Mr Miller is the author of: ‘Information and Communication Technology Tools for Better Government’ a paper commissioned by the Cabinet Office Minister in preparation for the Modernising Government White Paper in 1998. Mr Miller also presents widely on Information Technology, E-working and E-Government.

9.05 Opening remarks
Professor Niamh Nic Daeid, University of Dundee, UK

Niamh holds a Bachelor of Science degree in Chemistry and Mathematics from the Dublin Institute of Technology and Trinity College Dublin and received her doctorate in bio inorganic chemistry from the Royal College of Surgeons in Ireland. She also holds a Bachelor of Arts in Psychology from the Open University.
Niamh has been involved in the development of policy and practice in forensic science, particularly in fire investigation and leads teams developing protocols for professional practice in fire investigation for both the UK and Europe. She was on council of the Chartered Society for Forensic Science (the UK professional body) for 9 years. She is the current chair of the European fire and explosion investigation working group of ENFSI (the European Network of Forensic Science Institutes) and chairs the coordinating committee for the INTERPOL forensic science managers symposium. She also serves as vice chair of the scientific advisory board of the International Criminal Court. She was also editor in chief of Science and Justice for 6 years.
She has published over 100 peer reviewed research papers in the forensic sciences, delivered over 150 conference presentations at National and International conferences and holds a grant portfolio in excess of 1.5 million pounds. Her research team are international and multi-disciplinary. They undertake operationally relevant research work related to fire investigation, drug chemistry, fingerprint enhancement, ballistics, tool marks and ink analysis and has received awards for her research and public engagement.
She undertakes independent casework in fire scene investigation, terrorist cases and the investigation of clandestine drugs.
Professor Sue Black is Director of the Centre for Anatomy and Human Identification at the University of Dundee and Deputy Principal. She is a forensic anthropologist and an anatomist, founder and past President of the British Association for Human Identification, and advisor to the Home Office and Interpol on issues pertaining to forensic anthropology in disaster victim identification (DVI). She is a fellow of the Royal Society of Edinburgh, a Fellow of the Royal Anthropological Institute, a Fellow of the Royal College of Physicians (Edinburgh), a Fellow of the Society of Biology and a certified forensic anthropologist. She was awarded an OBE in 2001 for her services to forensic anthropology in Kosovo, the Lucy Mair medal for humanitarian services and a police commendation for DVI training in 2008. She was awarded both the Brian Cox and the Stephen Fry awards for public engagement with research and in 2013 her Centre was awarded the Queen’s Anniversary Prize for Higher and Further Education.

9.15 Opening remarks
Professor Pete Downes OBE FMedSci FRS, University of Dundee, UK

Professor Downes is a distinguished biochemist with more than ten years’ experience in the commercial sector and a university career combining internationally recognised scientific achievement, academic leadership and political influence. He has played a key role in developing life sciences at the University of Dundee to its current status as a global player (UK top 5 for Biological Sciences in RAE 2008), making a significant impact on the Scottish economy and on the understanding and treatment of major diseases including diabetes and cancer. As Principal he has led the University to achieve record levels of research funding, to the top of the UK rankings for student experience and to be recognised internationally for its economic, social and cultural impact.

9.20 Crime scene science – what the future will look like
Professor Keith Inman, California State University East Bay, USA

Much, if not all, of the current research in forensic science is limited to the analysis and interpretation of items believed to be “evidence,” and therefore relevant to a violent event. But the reverse work is rarely undertaken: research dedicated to understanding how and what kind of physical evidence is produced during a violent act (bloodstain patterns excepted). Yet research into the production of such evidence would surely assist in the examination of the aftermath of violent events (the crime scene); predicting what evidence should be found would assist immeasurably in a scenes-of-crime examination by provoking hypothesis formation and subsequent searching for expected evidence at the earliest possible time in a criminal investigation. This would allow forensic science to expand its role from being merely reactive to predictive, injecting science into an earlier stage of the criminal investigation than is currently practiced.

The heart of such research might revolve around a “crime scene theater,” where specific acts, both of violent and everyday actions, might be simulated and repeated to provide a “sphere of expectations,” both quantitative and qualitative, for the production of relevant physical evidence. Thus crime scene science in the future might best be served not only by the invention of new techniques to find and record evidence, but by investigation into the production, dispersion, persistence, and degradation of physical evidence resulting from violent events.

Keith Inman holds a B.S. and M.Crim., both from the University of California at Berkeley. He has been a Fellow of the American Board of Criminalistics, and is currently a member of the California Association of Criminalists. In his professional career he has been employed as a criminalist by both public and private forensic science laboratories, and continues to consult with attorneys in civil and criminal litigation. He is currently an Associate Professor in the Criminal Justice Administration department at California State University, East Bay. He has co-authored An Introduction to DNA Forensic Analysis and Principles and Practice of Criminalistics: The Profession of Forensic Science, as well as numerous other scholarly publications.

His primary expertise is in DNA, crime scene examination, and crime scene reconstruction. His research interests include the interpretation of complex DNA samples, as well as the philosophical and epistemological foundations of forensic science processes.

10.00 Discussion
10.10 Coffee

10.40 Developments in fingerprint identification
Professor Christophe Champod, University of Lausanne, Switzerland

This presentation will discuss the major developments in the area fingerprint identification that followed the publication of the NAS report in 2009 entitled: *Strengthening Forensic Science in the United States: A Path Forward*. The report portrayed an image of a field of expertise used for decades without the necessary scientific underpinning. The achievements and needs in some selected areas of fingerprinting will be covered. It includes:

- **The measurement of the accuracy, reliability, repeatability and reproducibility of the conclusions offered by experts.** We will explore if and how the profession can take advantage of measured error rates and the impact on reporting practices.

- **The development of statistical models in the area of friction ridge skin comparison and evaluation.** A challenge will be to reconcile a traditional practice dominated by deterministic conclusions with the probabilistic logic of any statistical model. That includes the management of potential conflicting outputs between an expert and a statistical model.

- **The ways of articulating and expressing conclusions in the area of fingerprint examination.** There is a call for greater candour, but it should be fostered in a way that ensures effective communication of the strengths and limitations of the evidence. The testimony will have to go beyond blunt statements such as “fingerprints are unique” or “it is based on my training and experience”.

- **The case file documentation of the fingerprint examination process.** There is a need to strike the right balance between the extent of document, the available resources and the risks of cognitive bias.

Christophe Champod received his M.Sc. and Ph.D. (summa cum laude) both in Forensic Science, from the University of Lausanne, in 1990 and 1995 respectively. He remained in academia until holding the position of assistant professor in forensic science. From 1999 to 2003, he led the Interpretation Research Group of the Forensic Science Service (UK), before taking a full professorship position at the School of Criminal Sciences (ESC) of the University of Lausanne. He is in charge of education and research on identification methods and maintains an activity as an expert witness in these areas. His research is devoted to the statistical evaluation of forensic identification techniques. The value of fingerprint evidence is at the core of his interests.

11.20 The end of the (forensic science) world as we know it? The example of trace evidence
Professor Claude Roux, University of Technology, Australia

The dominant conception of forensic science as a patchwork of disciplines primarily assisting the criminal justice system (i.e. forensics) is in crisis or at least shows a series of anomalies and serious limitations. The symptoms have been largely discussed by various commentators and in a number of reports in recent years. Without a doubt, the 2009 report of the US National Academies of Science epitomises the criticisms. Further, the almost generalised adoption of stricter business models in forensic science casework compounded with ever-increasing normative and compliance processes place additional pressures on a discipline that already appears in difficulty. One may ask the question whether these issues are not simply the result of an unfit paradigm. If this is the case, the current problems faced by forensic science may indicate future significant changes for this discipline.

To facilitate the broader discussion, this presentation will focus on trace evidence, an area that is seminal to forensic science, both for epistemological and historical reasons. However, there is little doubt that this area is currently under siege worldwide. Current and future challenges faced by trace evidence will be discussed, along with some possible answers. The current situation ultimately presents some significant opportunities to re-invent not only trace evidence but also forensic science. Ultimately, a distinctive, more robust and more
reliable science may re-emerge through rethinking the forensics paradigm, revisiting fundamental forensic science principles and adapting them to the 21st Century.

Claude Roux is Professor of Forensic Science and the founding Director of the Centre for Forensic Science, University of Technology, Sydney, Australia. He obtained a BSc and a PhD from the University of Lausanne, Switzerland. He moved to Australia upon the completion of his PhD in 1996. He has attracted $5M in competitive research grants in the last 5 years.

Claude’s research activities cover a broad spectrum of forensic science including trace evidence and chemical criminalistics, document, fingerprints and forensic intelligence. His research has been largely driven by his vision of forensic science as a distinctive academic and holistic research-based discipline. In addition to the publication of over 120 refereed papers and 25 book chapters and a large number of conference presentations, Claude’s research attracted significant media coverage and 20 awards.

Claude is a member of the editorial board of six scientific journals and of a number of working and advisory groups including the Scientific Advisory Board of the Office of the Prosecutor of the International Criminal Court, and is the current President of the Australian & NZ Forensic Science Society (ANZFSS) and a Council member of the Australian Academy of Forensic Sciences. He was the Chair of the 20th International Symposium on the Forensic Sciences (ANZFSS Symposium) in Sydney in 2010.

12.00 Discussion

12.15 Lunch

Session 2: Research in forensic science, beyond the state of the art
Chair: Ms Sue Ballou, National Institute of Standards and Technology (NIST), USA

Susan Ballou is the Program Manager for the Forensic Sciences Program within the Office of Special Programs, at the National Institute of Standards and Technology (NIST), Gaithersburg, MD. Prior to her current position, she served as the lead serologist for the Montgomery County Police Department (MCPD) Crime Laboratory. She holds a Master of Science degree in Biotechnology from The Johns Hopkins University and an Undergraduate degree, Forensic Science, within the Criminal Justice Program from the University of New Haven, West Haven, Connecticut. Qualified as an Expert in 179 court cases she has assisted with crime scene investigations and has taught this information at The Judge Advocate General’s Legal School and Center in Charlottesville, Virginia. Ms. Ballou has held the position of ASTM E30 chair receiving the honor of the Forensic Science Award for the establishment of a new subcommittee. She is a Fellow of the American Academy of Forensic Sciences (AAFS), a recipient of the AAFS Criminalistics Section Mary E. Cowan Outstanding Service Award and a trustee of the Forensic Science Foundation. She has given numerous presentations on a wide variety of forensic science topics and writes articles for the International Association of Identification newsletter.

13.10 Advances in analytical forensic science
Dr Kenneth G Furton, Florida International University, USA

Abstract unavailable at time of print.

Kenneth G. Furton is the current provost and executive vice president of Florida International University. Having started at FIU in 1988 as an assistant professor in chemistry, Dr. Furton is a leading scholar in forensic chemistry, specializing in scent detection. He founded FIU’s International Forensic Research Institute (IFRI) in 1997, which is globally recognized as a premier institute on forensic science. Before ascending to the Provostship, Dr. Furton served as the Dean of the College of Arts and Sciences in 2007. There, he transformed the university’s largest college into three mission-based interdisciplinary schools, helped raise nearly $50 million in philanthropic gifts and strategically increased research funding from $27 million to $60 million annually. Dr. Furton earned a B.S. in Forensic Science at the University of Central Florida in 1983, a Ph.D. in Analytical Chemistry at Wayne State University in 1986 and completed post-doctoral studies in Nuclear Chemistry at the University of Wales, Swansea U.K in 1988. His expertise has led him to serve in numerous local, national and international professional organizations, including the National Academy of Sciences, the National Nuclear Security Administration and the Scientific Working Group on Dog and Orthogonal Detector Guidelines.
13.50 The future of forensic DNA analysis
Dr John Butler, National Institute of Standards and Technology (NIST), USA

The author’s thoughts and opinions on where the field of forensic DNA testing is headed for the next decade are provided in the context of where the field has come over the past 30 years. Like the Olympic motto of “faster, higher, stronger”, forensic DNA protocols can be expected to become more rapid, sensitive, and provide stronger investigative potential. New short tandem repeat (STR) loci have expanded the core set of genetic markers used for human identification in Europe and the United States. Rapid DNA testing is on the verge of enabling new applications. Next-generation sequencing has the potential to provide greater depth of coverage for information on STR alleles. Familial DNA searching has expanded capabilities of DNA databases in parts of the world where it is allowed. Challenges and opportunities that will impact the future of forensic DNA are explored including the need for education and training to improve interpretation of complex DNA profiles.

John M. Butler is NIST Fellow and Special Assistant to the Director for Forensic Science at the National Institute of Standards and Technology. He is author of the internationally acclaimed textbook *Forensic DNA Typing* as well as more than 140 scientific articles and invited book chapters. ScienceWatch.com named him as number one in the world as a high-impact author (number of citations per paper published) in legal medicine and forensic science for the decade of 2001-2011. Dr. Butler has a B.S. in chemistry from Brigham Young University and a Ph.D. in analytical chemistry from the University of Virginia.

14.30 Discussion

14.40 Tea

15.10 Imaging and virtual autopsy
Dr Stephan Bolliger, Institute of Forensic Medicine, University of Zurich, Switzerland

In forensic medicine, a thorough and clear documentation of findings is essential if the case is to be presented at court.

In order to create a three-dimensional documentation of findings which can be reassessed if necessary by other experts, the research project “Virtopsy®” was launched in the late 1990’s. This project combined autopsy results with forensic imaging in the form of computed tomography, magnetic resonance tomography and surface scanning. The success of this project eventually succeeded in convincing the courts in Switzerland to accept these novel methods as evidence. As opposition toward autopsies has grown over the last decades, Virtopsy® also strives to elaborate additional methods which can answer the main forensic questions without autopsy. These methods comprise of post-mortem angiography for illustration of the vascular bed and image-guided tissue and fluid sampling for histological, toxicological and microbiological examinations.

To our opinion, forensic imaging is an objective method which offers the possibility for a reassessment of the findings by other experts, even after burial or cremation of the corpse, thus leading to a greater security at court. Augmented by tissue and fluid sampling as a minimally invasive technique, forensic imaging offers a viable alternative to autopsy in certain cases.

Stephan Bolliger MD, studied medicine at the University of Basel, Switzerland, and earned his doctorate in 2000 on an experimental study on TNF signalling pathways in mice.

After a year in clinical pathology and working as a resident in a geriatric hospital in Basel, Dr Bolliger worked at the Institute of Forensic Medicine in Bern, Switzerland, where he was board-certified in forensic medicine in 2005.

He has authored and co-authored over 60 journal publications and has written numerous book chapters on forensic imaging. His main fields of interest are biomechanical aspects of trauma and imaging of these. He is a frequently engaged reviewer, especially regarding articles on ballistics, his main field of expertise.
In March 2013, Dr Bolliger joined the Institute of Forensic Medicine in Zurich, Switzerland, where he is deputy head of the Department of Forensic Medicine and Imaging.

15.50 Bridging the gap: from biometrics to forensics
Professor Anil Jain, Michigan State University, USA

Biometric recognition, or simply biometrics, refers to "Automated recognition of individuals based on their behavioral and biological characteristics." The success of fingerprints in forensics and law enforcement applications, coupled with growing concerns related to national security, financial fraud and cyberattacks, has generated a huge interest in utilizing fingerprints, as well as other biological traits, for automated person recognition. It is, therefore, not surprising to see biometrics permeating various segments of our society. Applications include smartphone security, mobile payment, border crossing, national civil registry, and access to restricted facilities. Despite these successful deployments, there are several existing challenges and new opportunities for person recognition using biometrics. In particular, when biometric data is acquired in an unconstrained environment or if the subject is uncooperative, the quality of the ensuing biometric data may not be amenable for recognition. As an example, recognizing subjects from face images captured in surveillance video frames is substantially more difficult than recognizing controlled mug shot images. Therefore, additional cues such as scars, marks and tattoos may have to be used in conjunction with partial low-resolution face images to recognize a person. In some situations, a face image of the suspect may not even be available. Rather, a composite image rendered by a forensic artist based on verbal descriptions provided by witnesses, may have to be used for recognition purposes. Indeed, some of the more recent biometric applications have a forensic “twist” to them. This talk will discuss how biometrics evolved from forensics and how its focus has shifted back to its origin in order to solve some of the challenging problems in forensic science.


16.30 Discussion

17.00 Close
Tuesday 3 February 2015

Session 3: Forensic interpretation and development
   Chair: Dr Üllar Lanno, European Network of Forensic Science Institutes, Estonia

Üllar Lanno is the Chairman of European Network of Forensic Science Institutes (EFSI) and director of Estonian Forensic Science Institute.
He has been a director of EFSI since January 1st 2008. Before this new position he was a director of 2nd national forensic institution – Estonian Forensic Medical Bureau (EFMB). In period 2006 - 2007 he was leading a merging committee of EFMB (under the Ministry of Justice) and National Forensic Service Center (unit inside of Police, under the Ministry of Interior).
Üllar graduated as a Medical Doctor (anesthesiologist-intensive care doctor). He has passed the marketing courses at Estonian Marketing Institute and his master’s degree was in business administration at Tallinn Technical University. He has an experience in sales and marketing field by being a Marketing Manager for Scandinavian biggest optical retailer Instrumentarium Corp. and Marketing Director for Toyota Motor Corp. - Baltic States operations. Before EFMB he was a chair of Health Care Foundation Merimetsa, which was responsible to construct a public-private-partnership based at the Medical Care facility in Tallinn.
Üllar was a Tallinn (capital of Estonia) City Council member from 2005 – 2007, Chairman of Network of Baltic States Forensic Institutions 2009 and Founder of Cybercrime Centre of Excellence Network for Training Research and Education in Tallinn.

9.00 Using cognitive neuroscience in forensic science: understanding and utilising the human element
   Dr Itiel Dror, UCL, UK

The human element plays a critical role in forensic science. It is not limited only to issues relating to forensic decision making, such as bias, but relates to most aspects of forensic work (some even take place before a crime is ever committed or long after the verification of the forensic conclusion). This talk explicates many aspects of forensic work that involve the human element and therefore show the relevance (and potential contribution) of cognitive neuroscience to forensic science. The ten aspects are: Proactive forensic science, selection during recruitment, training, crime scene investigation, forensic decision making, verification and conflict resolution, reporting, the role of the forensic examiner, presentation in court, and judicial decisions. As the forensic community is taking on the challenges introduced by the realisation that the human element is critical for forensic work, new opportunities emerge which allow for considerable improvement and enhancement of the forensic science endeavour.

Dr Itiel Dror is a cognitive neuroscientist. Interested in the cognitive architecture that underpins expertise, he attained a PhD at Harvard University. In the forensic domain he has demonstrated how contextual information can influence judgments and decision making of experts; he has shown that even fingerprint and DNA experts can reach different conclusions when the same evidence is presented within different extraneous contexts. Dr
Dror has published over 100 research articles, and has been extensively cited in the Scottish Fingerprint Public Inquiry and the American National Academy of Sciences Report on Forensic Science, and is the chair of the NIST/NIJ Forensic Human Factor Group. Dr Dror has worked with the London Metropolitan Police and other police forces in the UK (as well as in The Netherlands, Finland, the US, and Australia) in providing training and implementing cognitive best practices in evaluating forensic evidence. More information is available at www.cci-hq.com.

9.40 The logical foundations of forensic science: future challenges
Dr Ian Evett, Principle Forensic Service Ltd, UK

The generation of observations is a technical process and the advances that have been made in forensic science techniques over the last fifty years have been staggering. But science is about reasoning – about making sense from observations. For the forensic scientist this is the challenge of interpreting a pattern of observations within the context of a legal trial. Here, too, there have been major advances over recent years and there is a broad consensus among serious thinkers, both scientific and legal, that the logical framework is furnished by Bayesian inference. There are two challenges for future development: the first is that of gaining acceptance in the courts of law for logical scientific reasoning; the second is that of creating a comprehensive framework for the epistemology of forensic science, carrying powerful implications for the nature of forensic expertise.

Originally a physics graduate, Ian Evett began his career in the Forensic Science Service (FSS) as a document examiner. He soon became interested in the potential for using measurements to assign evidential value to handwriting comparisons and returned to university to study statistics. He has since researched many different areas of forensic science, including fingerprints and DNA profiling. His overriding interest, however, is the logic of evaluating scientific evidence in criminal proceedings. His publications include over 100 papers and, with Professor Bruce Weir, a book on DNA profiling statistics. He has a DSc from the University of Strathclyde and an honorary DSc from the University of Lausanne, both in recognition of his contributions to the science of evidence interpretation. He is a Chartered Statistician and an Honorary Life Fellow of the Chartered Society of Forensic Sciences. He remained in the FSS until its closure and is now an associate of Principal Forensic Services Ltd.

10.20 Discussion

10.30 Coffee

11.00 The interface between science and technology: how technology will cause a paradigm shift in the role of forensic institutes in the criminal justice system
Professor Arjan van Asten, Netherlands Forensic Institute and the University of Amsterdam, Netherlands

Technology can be regarded as a vital catalyst in the transition of scientific findings and insights into innovation. Added value of science is materialized through technology enabling society to fully benefit from new discoveries. From this broad and generic perspective it is very interesting to take an in-depth look at the interface between technology and forensic science. Contemporary forensic institutes operate state-of-the-art laboratories where evidence is studied with modern instruments. Without this often high-tech and expensive equipment the forensic expert would not be able to generate the forensic findings that so often are of vital importance to solve a crime. At the Netherlands Forensic Institute a forensic innovation effort is currently undertaken to create new forensic methods that can be broadly applied in the criminal justice system. In bringing forensic science "from the lab to the scene" the added value can be greatly increased especially if field methods do not just generate indicative information but rather robust findings that can directly be used as evidence. The regular use of forensic methodology outside a controlled laboratory environment and by untrained forensic experts requires substantial technological efforts aimed at automated forensic interpretation and minimizing potential operator errors. Wireless communication could form the basis of creating a forensic platform for quality assurance and central analysis of the data gathered by numerous field devices. This
technological revolution in forensic science could lead to a paradigm shift in which the role of the forensic expert will change from evidence examiner to developer of evidence analysers and platforms. In the criminal justice chain this ultimately could lead to a shared interdisciplinary forensic platform. The potential of this new approach in forensic science will be illustrated through three NFI innovation projects; LocalDNA (DNA profiling platform), NFIdent (chemical identification platform for drugs of abuse) and HANSKEN (digital data platform).

Arian van Asten studied analytical chemistry at the University of Amsterdam. He obtained his PhD from the same University in 1995. After working for over 10 years in the chemical industry he transferred to the Netherlands Forensic Institute in 2006 and became involved in forensic science. He has been working at the NFI as member of the management team, department head and principal scientist. In June 2012 Arian van Asten was appointed professor at the Faculty of Science of the University of Amsterdam on a special chair in Forensic Analytical Chemistry. Together with Professor Dr Maurice Aalders he manages the Co van Ledden Hulsebosch Center (CLHC), the Amsterdam Center for Forensic Science and Medicine. The center started in September 2013 as a collaboration of the Faculty of Science and the Academic Medical Center of the University of Amsterdam and the Netherlands Forensic Institute.

11.40 Integrating research in operational practice
Professor Alastair Ross AM, National Institute of Forensic Science (NIFS), Australia

Research and development can be classified into three categories: technology adoption, technology extension and knowledge and technology creation. In general, technology adoption is embedded in operational forensic science laboratory practice but the latter two categories require partnerships with industry and/or academia both to conduct the research and implement the outcomes.

In a 2012 survey, Australian and New Zealand forensic science laboratories identified a number of ‘roadblocks’ to undertaking research and operationalising research outcomes. These included insufficient time and funding, a lack of in-house research experience and the absence of a tangible research culture.

Allied to this is that increasingly, forensic science research is conducted in a ‘commercial in confidence’ environment and the outcomes are not readily, or cost effectively available to be integrated into operational forensic science laboratories. These issues will be discussed.

Alastair is currently the Director of the ANZPAA National Institute of Forensic Science (NIFS). He also held this position as the inaugural Director from 1992 to 2003. From 2003-2008 Alastair was Director of the Victoria Police Forensic Services Department, a full service forensic facility with over 300 staff.

Alastair holds a Graduate Diploma in Business Administration and a Master of Applied Science (Research) from the University of South Australia.

Alastair received the Adelaide Medal from the International Association of Forensic Sciences for international contributions to forensic science in 2002 and is a Member of the Order of Australia (AM).

12.20 Discussion

12.30 Lunch

13.30 New psychoactive substances – catalysing a shift in forensic science practise?
Dr Justice Tettey, United Nations Office on Drugs and Crime (UNODC), Austria

The analysis of substances of abuse remains one of the most matured areas in forensic science with a strong scientific basis, namely analytical chemistry. The current evolving drug markets, characterised by the global emergence of new psychoactive substances and the need for forensic scientists to identify an unprecedented and ever increasing number of new psychoactive substances, presents a unique challenge to this discipline. This presentation looks at the current situation with new psychoactive substances at the global level and the challenges posed to the otherwise technically robust forensic science discipline of analysis of substances of abuse. It addresses the preparedness of forensic science to deal with the current situation and identifies the need for a shift in forensic science practice, especially one which embraces research and looks beyond normal casework in order to provide the much needed data for developing effective policy responses to the new psychoactive substance problem.
Dr Justice Tettey joined the United Nations Office on Drugs and Crime in 2008 as Chief of the Laboratory and Scientific Section, Division of Policy Analysis. The section is responsible for the development and implementation of the office’s Global Scientific and Forensic Services Programme which seeks to ensure that Member States have access to, and use quality forensic science services in their fight against drugs and crime. Justice Tettey holds a Bachelor of Pharmacy degree from the University of Science & Technology, Ghana and a Master of Science in Pharmaceutical Analysis and PhD in Pharmaceutical Sciences, from the University of Strathclyde, Glasgow. He started his career in medicines regulation with the Ghana Pharmacy Board. Following his postgraduate studies, he was awarded a Glaxo-Wellcome Postdoctoral Fellowship for research in chemical toxicology at the Department of Pharmacology and Therapeutics, University of Liverpool Medical School. He later joined the Strathclyde Institute of Pharmacy and Biomedical Sciences, University of Strathclyde in 2000, and led research in Pharmaceutical Analysis and Drug Metabolism, in addition to teaching on the Master of Pharmacy and Master of Science in Pharmaceutical Analysis programmes until 2008. Justice Tettey is a Fellow of the Royal Society of Chemistry of the United Kingdom; Fellow of the United Kingdom Higher Education Academy; Member of the Pharmaceutical Society of Ghana; Member of the British Pharmacopoeia Commission Expert Panel on Biological and Biotechnology Products (2003 to date) and has served as Visiting/Honorary Lecturer at the Department of Pharmacology and Therapeutics, University of Liverpool Medical School (2000-2006) and Strathclyde Institute for Biomedical Sciences, University of Strathclyde, Glasgow (2008-2010).

14.10 Forensic science, criminal justice and Doctor Faustus

Professor Paul Roberts, University of Nottingham, UK

Expert evidence has been presented in common law criminal trials for many centuries. In modern times, innovation in forensic science has greatly facilitated criminal prosecutions, and expanded the law’s reliance on expert testimony. The law’s relationship with scientific proof is complex and multifaceted, but in the final analysis must answer to the dictates of justice. This is first and foremost a matter of political morality: justice requires due process, transparency, legitimate authority and respect for fundamental human rights, not merely accurate fact-finding.

For all its undoubted epistemic power, there are also some very well-documented risks and problems associated with relying on scientific evidence as a basis for verdicts in criminal trials. Forensic science has been implicated in many high profile miscarriages of justice over the last several decades. There is, by now, a surfeit of diagnosis – we know, more or less, what tends to go wrong when mistakes are made – but limited useful prescription for reform. Courts in England and Wales are currently grappling with these fundamental challenges, not always entirely successfully. In the meantime, continuing to rely on scientific evidence known to be questionable or flawed, if not downright unreliable, begins to resemble a Faustian pact for our criminal justice system.

This talk identifies the structural dynamics of our present existential predicament and canvasses practical options for institutional salvation.

Paul Roberts is Professor of Criminal Jurisprudence in the University of Nottingham School of Law, and an Adjunct Professor in the University of New South Wales Faculty of Law. His principal publications include: Roberts and Zuckerman, Criminal Evidence (OUP, 2/e 2010), Roberts (ed), Expert Evidence and Scientific Proof in Criminal Trials (Ashgate, 2014); Roberts and Hunter (eds), Criminal Evidence and Human Rights (Hart, 2012); Roberts and Redmayne (eds), Innovations in Evidence and Proof (Hart, 2007); and Roberts and Wilmore, The Role of Forensic Science Evidence in Criminal Proceedings, Royal Commission on Criminal Justice Research Study No.11 (HMSO, 1993). He has been visiting professor or invited lecturer at the China University of Political Science and Law (CUPL), Beijing; the International Islamic University Malaysia (IIUM); the University of Warsaw; the Jagiellonian University in Krakow; the University of Gottingen; Oxford University; and the University of Natal (Pietermaritzburg), RSA. He has served as a consultant to the English and Scottish Law Commissions, the Crown Prosecution Service, and the Forensic Regulator, and is a member of the International Association of Evidence Science.

14.50 Discussion

15.00 Tea
15.30  Science and war crimes
Professor Sir Geoffrey Nice QC, International Criminal Court, UK

Abstract unavailable at time of print.

Barrister since 1971. Prosecuted for the UN at the International Criminal Tribunal for the former Yugoslavia 1998 – 2006 (including Goran Jelasic first ICTY genocide case to reach a conclusion and the case of Slobodan Milosevic. 2007 to date represents and advises governments (or proxies) on war crimes issues (Sudan, Kenya, Comoros, Sri Lanka, Bosnia, Kosovo, Georgia) and works pro bono for victims and victim groups who are unable to achieve representation at international tribunals or courts (Burma, North Korea, Iran, Saif Gaddafi). Gresham Professor of Law 2012 -

16.10  The legal framework for sounder forensic science evidence
The Rt Hon Lord Thomas of Cwmgiedd, Lord Chief Justice of England and Wales, UK

Scientifically rigorous but accessible forensic science matters in ensuring that the innocent are not convicted of crimes they did not commit and that the perpetrators of serious crimes are brought to justice. As Forensic evidence has become commonplace, even expected in criminal trials, the public’s faith in forensic science has become an important part of the reality of the way in which our system works.
The credibility of the criminal justice system depends on the quality of the science underpinning the forensic evidence. Both the legal and science communities need to focus on how validated robust forensic data is best communicated to the court and how accessible and pertinent science can be presented to juries so they are able to focus on the evidence in front of them.
Progress since 2009 has been seen in the form of new criminal procedure rules, practice directions and precedents designed to improve the way in which forensic evidence is approached in the courtroom. There is, however, still more which can be done and this speech will explore the case for the introduction of “technical primers” in areas where there is consensus amongst the scientific community, assisting juries with the basics so they are free to deal with the evidence.

Lord Thomas was educated at Trinity Hall, Cambridge, where he read law, after which he became a Commonwealth Fellow at the University of Chicago Law School. He was called to the Bar by Gray’s Inn in 1969 and became a Bencher at the Inn in 1992. He practiced at the Commercial Bar in London from 1971 and became a Queen’s Counsel in 1984. He was an Inspector into the affairs of Mirror Group Newspapers plc when that company was owned by the late Mr Robert Maxwell.
He was appointed a Judge of the High Court of England and Wales in 1996 and was assigned to the Queen’s Bench Division and to the Commercial Court. From 1998-2001 he was one of the Presiding Judges of the Wales and Chester Circuit. He was Judge in Charge of the Commercial Court in London from April 2002 to July 2003, when he was appointed as a Lord Justice of Appeal. He has been a member of the Judges’ Council since 2002. He was the Senior Presiding Judge for England and Wales from 2003 to 2006. From 2008 to October 2011 he was Vice-President of the Queen’s Bench Division and President of the Queen’s Bench Division from October 2011 to October 2013. He was President of the European Network of Councils for the Judiciary from May 2008 to December 2010. He has been Lord Chief Justice of England and Wales since October 2013.
He is an Honorary Fellow of Trinity Hall, Cambridge and a Fellow of the Universities of Cardiff, Aberystwyth, Swansea and Bangor and an Honorary Doctor of Law of the Universities of South Wales, the West of England and Wales.
He is Vice-President of ARIAS (UK), Past President of the British Insurance Law Association and a Vice-President of the British Maritime Law Association. He is Co-Chairman of the Trustees of the International Law Book Facility.

16.50  Panel discussion – the way forward
Professor Niamh Nic Daeid, University of Dundee, UK

Niamh holds a Bachelor of Science degree in Chemistry and Mathematics from the Dublin Institute of Technology and Trinity College Dublin and received her doctorate in bio inorganic chemistry from the Royal College of Surgeons in Ireland. She also holds a Bachelor of Arts in Psychology from the Open University.
Niamh has been involved in the development of policy and practice in forensic science, particularly in fire investigation and leads teams developing protocols for professional practice in fire investigation for both the UK and Europe. She was on council of the Chartered Society for Forensic Science (the UK professional body) for 9 years. She is the current chair of the European fire and explosion investigation working group of ENFSI (the European Network of Forensic Science Institutes) and chairs the coordinating committee for the INTERPOL forensic science managers symposium. She also serves as vice chair of the scientific advisory board of the International Criminal Court. She was also editor in chief of Science and Justice for 6 years.

She has published over 100 peer reviewed research papers in the forensic sciences, delivered over 150 conference presentations at National and International conferences and holds a grant portfolio in excess of 1.5 million pounds. Her research team are international and multi-disciplinary. They undertake operationally relevant research work related to fire investigation, drug chemistry, fingerprint enhancement, ballistics, tool marks and ink analysis and has received awards for her research and public engagement.

She undertakes independent casework in fire scene investigation, terrorist cases and the investigation of clandestine drugs.

Professor Sue Black OBE FRSE, University Dundee, UK

Professor Sue Black is Director of the Centre for Anatomy and Human Identification at the University of Dundee and Deputy Principal. She is a forensic anthropologist and an anatomist, founder and past President of the British Association for Human Identification, and advisor to the Home Office and Interpol on issues pertaining to forensic anthropology in disaster victim identification (DVI). She is a fellow of the Royal Society of Edinburgh, a Fellow of the Royal Anthropological Institute, a Fellow of the Royal College of Physicians (Edinburgh), a Fellow of the Society of Biology and a certified forensic anthropologist. She was awarded an OBE in 2001 for her services to forensic anthropology in Kosovo, the Lucy Mair medal for humanitarian services and a police commendation for DVI training in 2008. She was awarded both the Brian Cox and the Stephen Fry awards for public engagement with research and in 2013 her Centre was awarded the Queen’s Anniversary Prize for Higher and Further Education.

17.00       Close
Participant List
Correct as of 22 January 2015

Ms Suzanne Abbott
Dr Nadia Abdul-Karim, UCL
Dr Craig Adam, Keele University
Miss Romana Ahmed, LGC
Ms Masuma Ahmed-Ali, London Metropolitan University
Linda Ainscough, Cellmark Forensic Services
Professor Colin Aitken, University of Edinburgh
Dr Adil Akram, Home Office National DNA Database Ethics Group
Ms Julie Allard, Forensic Context & Principal Forensic Services
Mr Chris Allen, Gloucestershire Constabulary
Mrs Kerri Allen, Forensic Context Ltd
Mr Mark Amaral, UCL
Mrs Abna Arthur-Browne
Sunny Bagga
Dr Matthew Beardah, Dstl
Mr Richard Belfield,
Mr Maurits Beltgens, University of Leicester
Mr Mohamed Nabil Bendris, National Office of Meteorology
Mrs Victoria Benson, LGC
Miss Carissa Beukes, Liverpool John Moore university
Ms Hazel Biggs, CAST
Mr Giorgio Blom, Staffordshire University
Dr Rachel Bolton-King, Staffordshire University
Dr Heather Bonney, Natural History Museum
Mr Adie Box, Royal Military Police
Ms Rachael Brewster, Loughborough University
Sharon Broome, Dstl
Miss Georgina Brown, University of York
Mr Stan Brown, Forensic Science Northern Ireland
Ms Caroline Browne, The Human Tissue Authority
Mrs Linda Brownlow, University of Greenwich
Dr Sarah Bunn, Parliamentary Office of Science & Technology
Mr David Butler, Nottingham Trent University
Mr Rody Butler, Garda Síochána Ombudsman Commission
Mr Ewen Callaway, Nature
Michelle Carlin, Northumbria University
The Rt Hon Lord Colin Carloway, Supreme Courts of Scotland
Dr Felicity Carlisle, Forensic Science Special Interest Group
Miss Sue Carney, Ethos Forensics
Mrs Susan Carolin, Dstl
Mr Richard Case, CAST, Home Office and The Fingerprint Society
Professor John Cassella, Staffordshire university
Laurent Chaminade, Imperial College Press
Ms Yuen Ting Chan, Public Health England
Mr Raymond Chapman, Metropolitan Police
Dr Dave Charlton, Surrey and Sussex Police
Miss Kelly Cheshire, UCL
Dr Matt Chinn, Ministry of Defence
Dr Alan Clamp, Human Tissue Authority
Mr Allan Clarke, Lynx Innovation Ltd
Ms Angelina Clarke, Essex University
Mr Duncan Clarke
Dr Simon Clement, Foster and Freeman Ltd
Mr Michael Cloonan, The Chartered Society of Forensic Sciences
Dr Kelsey Cook, National Science Foundation
Mr Daniel Cressy, Nature
Dr Craig Cunningham, University of Dundee
Dr Barbara Daniel, King’s College London
Cristina d’Aniello, University of Leicester
Miss Jemma Davoudian, UCL
Dr Nick Dawnay, LGC
Professor Lorna Dawson, James Hutton Institute
Ms Tasha D’Cruz, Imperial College Press
Dr Jan De Kinder, National Institute of Criminalistics and Criminology
Miss Catherine de Lange
Miss Natasha de Souza, Cellmark Forensic Services
Dr Peter Dean, Suffolk Coroner Service
Miss Zoe Delaney, Sussex Police
Ms Dorothea Delpech, UCL
Mr Roger Derbyshire, Cellmark Forensic Services
Dr Hannah Devlin, The Times
Ms Lisa Dickson, University of Kent
Miss Victoria Druy, Cellmark Forensics
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Miss Helen Eawaker, UCL
Dr Lucy Easthope, University of Lincoln
Mr Marwan El Khoury, University of Leicester
Professor Martin Evison, Northumbria University
Robin Fallow
Mrs Kirsty Faulkner, Home Office
Mrs Leigh Fleeman, Metropolitan Police
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Dr James French, UCL
Miss Sally Gamble, UCL
Miss Ilona Gaynor, The Department of No
Ms Karen Georgiou, Bedfordshire, Hertfordshire & Cambridgeshire Forensic Services
Dr Baljit Ghatora, Kingston University
Miss Simona Gherghe, UCL
Miss Elizabeth Gilchrist, King’s College London
Professor Peter Gill, Norwegian Institute of Public Health
Dr Richard Gill, European Network of Forensic Science Institutes (ENFSI)
Mr Douglas Glew, Royal Military Police
Dr Erica Gold, University of Huddersfield
Dr Giles Graham, AWE
Mrs Susan Grayeff, The Technion
Mr Robert Green OBE, University of Kent
Ms June Guiness OBE, Home Office
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Mr Paul Hackett, Key Forensic Services
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Ms Sarah Hainsworth, University of Leicester
Miss Catherine Hale, Cellmark Forensic Services
Miss Lisa Hall, Metropolitan Police Forensics
Dr Martin Hall, Natural History Museum
Dr James Hardy, BAFO
Dr Christopher Harling CBE, NDNAD Ethics Group
Mr David Hartshorne, Cellmark Forensic Services
Professor David Hawksworth CBE, Royal Botanic Gardens Kew
Mr Stephen Hay, Pilot Lite Ventures
Mr Anthony Haydon
Ms Dagmar Heinrich, UCL
Professor Carol Henderson, Stetson University
Mrs Nicola Hill
Mrs Denise Hillier, Cranfield University
Professor Robert Hillman, University of Leicester
Mr David Hobbs
Mr Ben Hood, Royal Military Police, Special Investigation Branch
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Ms Tunde Huszar
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Mr Paul Jira, Staffordshire University
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Mrs Zale Johnson, Home Office CAST
Mr Andrew Johnston, Cranfield University
Miss Sumaya Jumale
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Mrs Zelda Kemp, Metropolitan Police Service
Mr Robert Kendall, Nottingham Trent University
Dr Roberto King, Foster + Freeman
Mr Jon Kyte, Thermo Fisher Scientific
Ms Jessica Lam, INTREPID Forensics, University of Leicester
Mr Jonathan Leake, The Sunday Times
Mrs Carolyn Lovell, Hampshire Constabulary
Dr Chanda Lowther-Harris, Metropolitan Police Service
Lord Eassie Ronald Mackay, Court of Session, Scotland
Ms Gaille MacKinnon, University of Dundee
Professor Alan Malcolm, The Parliamentary and Scientific Committee
Mr Nik Males, Metropolitan Police Service
Mr Shaun Mallinson, Home Office Centre for Applied Science and Technology
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Dr Georgina Meakin, University College London
Mr Devendra Meena, University of Oxford
Mr Sriyal Mendis
Mr Peter Merrill, National Crime Agency
Mr Steve Mewett, Sussex Police
Miss Sofia Mirmigkou, University of Leicester
Ms Nicola Mitchell
Marina Montman
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Dr Ruth Morgan, UCL
Dr Stephen Morley, Forensic Toxicology Unit, Leicester
Mr Rupert Morris
Ms Anuta Musat
Miss Sherry Nakhaeizadeh, UCL
Ms Leisa Nichols-Drew, Forensic Select
Ms Isabel Nisbet, National DNA Database Ethics Advisory Group
Detective Superintendent John Nolan, An Garda Síochána
Dr Eadaoin O’Brien, University of Essex
Mr Tom O’Brien, Essex Police
Mr Paul Olden, Key Forensic Services
Miss Charlotte-Maria Orphanou, Staffordshire University
Ms Alice Oven, Imperial College Press
Mr Murat Ozger, University of Lincoln
Ms Saisha Patel
Miss Jennifer Perales, Avon and Somerset Constabulary
Ms Catherine Pettinger, UCL
Mr Alan Pierce, GE Healthcare
Mr Etienne Pillin
Dr Susan Pope, Principal Forensic Services
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Mr Roger Robson, Forensic Access
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Miss Sian Smith, UCL
Mr Harry Smy, City of Westminster College
Mr Alexander Smyth, University of Leicester
Dr Mark Spencer, The Natural History Museum
Ms Rosalind Spencer, American Board of Forensic Document Examiners
Ms Karen Squibb-Williams, Acorn Chambers
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Miss Thulasir Sris, Staffordshire University
Ms Rebecca Stafford-Allen, LGC
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Mr Tim Vernimmen
Ms Anastasia Vihornova
Annelies Voorhaar
Mr Stuart Waddell, Robert Gordon University
Mr Steven Walden, Cardiff University
Mr Max Walker
Judge Mark Wall QC
Miss Alice Walters, Metropolitan Police Service
Dr Dominic Watt, University of York
Dr Mark Weiss, National Science Foundation
Mr John Welch, Forensic Document Examiner
Mr Sandy Westwater, PilotLite Ventures
Dr Jon Wetton, University of Leicester
Dr Amoret Whitaker, Natural History Museum
Mr Colin White, Hampshire Constabulary
Mr Richard White
Mr Shane White, Garda Siochana Ombudsman Commission
Mrs Gemma Wilkinson, Merseyside Police
Miss Beth Wilks, UCL
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Professor Tim Wilson, Northumbria Law School
Dr Patricia Wiltshire, University of Aberdeen
Miss Kirsty Winters, Warlingham Sixth Form
Dr Christopher Wood, Northumbria University