



INTERNATIONAL UNION OF GEOLOGICAL SCIENCES (IUGS)

INITIATIVE ON FORENSIC GEOLOGY (IFG)

ANNUAL REPORT FOR 2017

DR LAURANCE DONNELLY, IUGS-IFG CHAIR

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**INTERNATIONAL UNION OF GEOLOGICAL SCIENCES (IUGS)
INITIATIVE ON FORENSIC GEOLOGY (IFG)**

Annual Report 2017

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**INTERNATIONAL UNION OF GEOLOGICAL SCIENCES (IUGS)
INITIATIVE ON FORENSIC GEOLOGY (IFG)
ANNUAL REPORT FOR 2017**

1 TITLE OF CONSTITUENT BODY

The International Union of Geological Sciences (IUGS), Initiative on Forensic Geology (IFG) was launched at the 62nd Executive Committee meeting of the IUGS, at UNESCO headquarters, in Paris, France, on 22 February 2011.

1.1 Report Objective

This document is the IUGS-IFG Chair's annual report for 2017. It has been produced for the IUGS Executive Committee and it gives summary of the IFG activities throughout 2017. A financial summary of the IFG accounts is also included.

2 AIM

2.1 Mission Statement

The aim of IUGS-IFG is to develop forensic geology internationally and promote its applications.

2.2 IUGS-IFG Objectives

The objectives of the IUGS-IFG are to:

1. Collate and disseminate data and information on forensic geology applied to policing and law enforcement, criminal, environmental and civil investigations;
2. Promote international meetings, seminars, conferences and training;
3. Develop a 'Committee' to act as principal advisers, collaborators and active participants;
4. Develop an international network whereby each 'member' will act as a principal contact in their respective country for the collation and dissemination of information on forensic geology;
5. Collate, make available and where appropriate review any existing documentation and publications in forensic geology; and
6. Produce a document endorsed by the Committee to be called; '*A Guide to Forensic Geology*'.

3 ROLE WITHIN IUGS SCIENCE POLICY

3.1 Background

The documented history of forensic geology can be traced to the latter half of the 19th Century. However, in recent years there has been renewed interests and developments in the multidisciplinary fields of forensic geology throughout the world. Since about 2000 numerous international meetings, conferences, seminars and training on different aspects of forensic geology has taken place. Furthermore, several text books have been published and there are technical papers in peer reviewed scientific and geological journals, conference proceedings, police and law enforcement magazines. Since 2011 IFG has formally represented the IUGS global interests in forensic geology. As such, IUGS-IFG provides training, knowledge transfer, capacity building and outreach events. These advocate the IUGS-IFG aim, '*to develop forensic geology internationally and promote its applications*'. The members of the IFG committee are senior representatives of their respected organisations and include geologists, geoscientists, police officers, forensic scientists and law enforcement agencies.

3.2 Main Approach

IUGS-IFG aims to raise the global awareness of forensic geology by holding meetings and conferences, promoting research, teaching, training and the operational deployment of forensic geologists. This will be consistent with the broad objectives of IUGS, and includes the following:

- **Knowledge transfer and capacity building:** This raises the levels of awareness and knowledge, and provides information about forensic geology;
- **Technology transfer and training:** This improvement in skill sets; and
- **Outreach:** This provides education and information to a range of stake holders that include; geologists, geoscientists, serving police officers, law enforcement organisations, the public, schools and universities, engineers, lawyers and the legal profession, forensic scientists, the media and politicians.

4 ORGANIZATION

The IUGS-IFG Committee comprises representatives from major geographical regions of the world and includes specialists from academia, industry, consultancy, operationally based forensic geologists, the police, law enforcement agencies and forensic organisations, as shown in Figure 4.1 and Table 4.1.

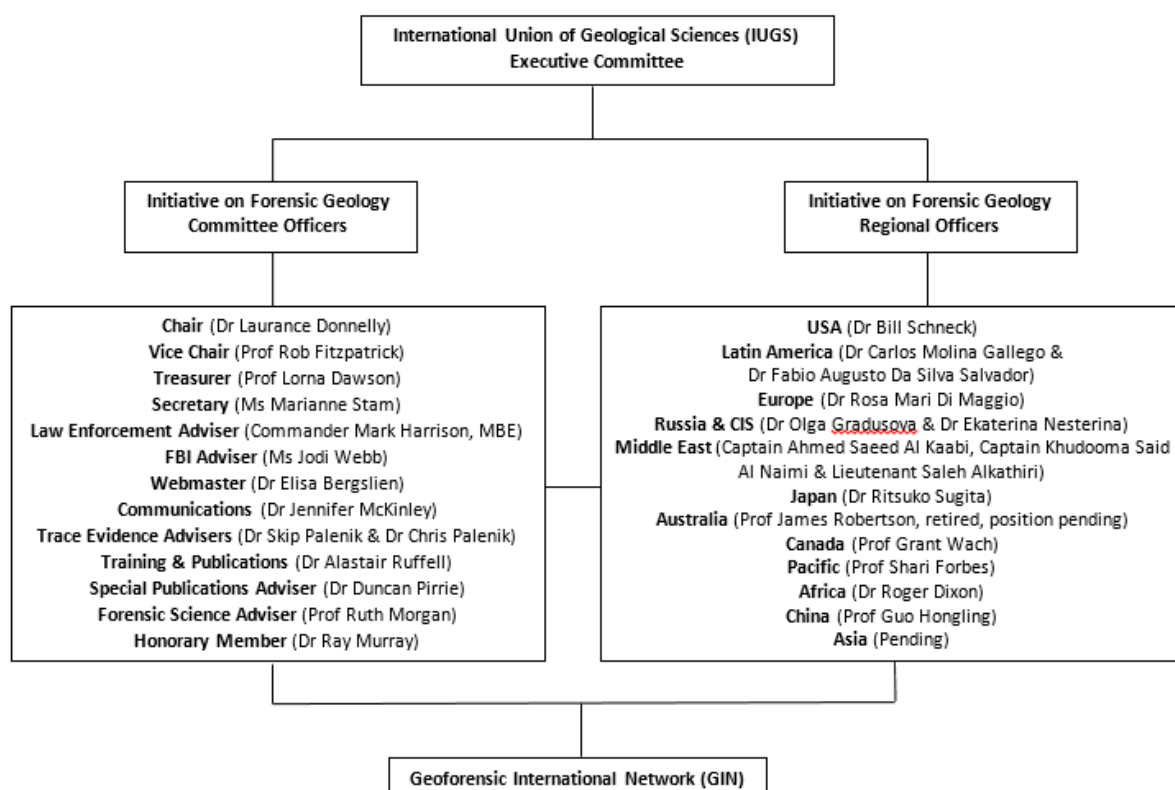


Figure 4.1 Structure of the IUGS-IFG Committee in 2017

4.1 IFG Committee Changes

The IUGS-IFG committee changes in 2017 were as follows:

- James Robertson retired as IUGS officer for Australia. In 2018, IUGS-IFG will consider a replacement for James.
- IUGS-IFG has identified a potential candidate, based in Singapore, to represent IFG as the officer for Asia. This will be progressed in 2018.
- Guo Hongling has been formally assigned to the IUGS-IFG committee as Officer for China.
- Alastair Ruffell is proposed to move from Training and Publications to Website Manager.
- Elisa Bergslien is proposed to move from to Website Manager to Global Membership Manager.
- There is a vacancy for Training and Publications.

POSITION	NAME	COUNTRY	AFFILIATION
Chair	Dr Laurance Donnelly ¹	England (UK)	IUGS-IFG & Manchester, England, UK
Vice Chair	Prof Rob Fitzpatrick ²	Australia	CSIRO, Australia
Treasurer	Prof Lorna Dawson ³	Scotland (UK)	The James Hutton Institute, Aberdeen, Scotland, UK
Secretary	Ms Marianne Stam ⁴	USA	California Department of Justice, Los Angeles, USA
Webmaster/Information Officer	Dr Elisa Bergslien ⁵	USA	SUNY Buffalo State, New York, USA
Geoforensic Law Enforcement Adviser	Commander Mark Harrison, MBE ⁶	Australia	Australia Federal Police, Australia
FBI Adviser	Dr Jodi Webb ⁷	USA	Federal Bureau of Investigation (FBI), Virginia, USA
Training and Publications	Dr Alastair Ruffell ⁸	Ireland (UK)	Queens University Belfast, Northern Ireland
Communications	Dr Jennifer McKinley ⁹	Ireland (UK)	Queens University, Belfast, Northern Ireland
Special Publications Adviser	Dr Duncan Pirrie ¹⁰	England (UK)	Helford Geoscience LLP, Cornwall, UK
Forensic Science Adviser	Prof Ruth Morgan ¹¹	England (UK)	University College London, JDI Centre for the Forensic Sciences, London, UK
Geological (Trace) Evidence Advisers	Dr Skip Palenik ¹² Dr Chris Palenik ¹³	USA	Microtrace LLC, Illinois, USA
Honorary Committee Member	Dr Raymond Murray ¹⁴	USA	Forensic Geologist, Montana, USA
Officer, USA	Dr Bill Schneck ¹⁵	USA	Washington State Patrol Crime Lab, USA
Officer, Latin America	Dr Carlos Molina Gallego ¹⁶ Dr Fabio Augusto Da Silva Salvador ¹⁷	Colombia Brazil	Universidad Antonio Narino Bogota, Colombia Brazilian Federal Police, Curitiba, Brazil
Officer, Europe	Dr Rosa Maria Di Maggio ¹⁸	Italy	Geoscienze Forensi Italia (Formerly Servizio Polizia Scientifica), Rome, Italy
Officer, Russia & CIS	Dr Olga Gradusva ¹⁹ Dr Ekaterina Nesterina ²⁰	Russia	Russian Federal Centre of Forensic Science and Soil Trace Evidence Experts, Moscow, Russia
Officer, Middle East	Captain Ahmed Saeed Al Kaabi ²¹ Captain Khudooma Said Al Naimi ²² Lieutenant Saleh Ali Al Katheeri ²³	UAE	Abu Dhabi Police, Forensic Evidence, United Arab Emirates
Officer, Japan	Ritsuko Sugita ²⁴	Japan	National Research Institute of Police Science, Japan
Officer, Australia	Prof James Robertson ²⁵	Australia	University of Canberra, Australia (retired, position pending)
Officer, Pacific	Prof Shari Forbes ²⁶	Australia	University of Technology, Sydney, Australia
Officer, Canada	Prof Grant Wach ²⁷	Canada	Dalhousie University, Nova Scotia, Canada
Officer, Africa	Dr Roger Dixon ²⁸	South Africa	University of Pretoria (Formerly, Forensic Science Laboratory, South African Police Service), South Africa
Officer, China	Dr Guo Hongling ²⁹	China	Institute of Forensic Science, Ministry of Public Security, Division of Trace Evidence Analysis, China
Offier, Asia	To be confirmed in 2018	Singapore	Pending

Table 4.1 IUGS-IFG committee in 2017.

5 EXTENT OF NATIONAL, REGIONAL & GLOBAL SUPPORT FROM SOURCES OTHER THAN IUGS

During 2017 direct support and support in kind for IUGS-IFG was provided by individual committee members and/or their respective employers/organisations. The in-kind value of this support is considerable. IUGS-IFG has estimated that the Committee Officers have provided at least **159 person days** during 2017. This has incurred by attendance at conferences, training courses, knowledge transfer events, provision of outreach events and the management of the Initiative. The value of this in-kind support is difficult to quantify, however a commercial value to the time spent on the IUGS-IFG in 2017 would possibly be in excess of approximately **USD (\$) 127,000**. In addition, participation in the various IUGS-IFG events during the year has also been supported directly by committee members employers and via research funding of an estimated value of approximately **USD (\$) 14,000**.

6 ACKNOWLEDGEMENTS

Throughout 2017, IUGS-IFG received support and collaboration from numerous organisations, which IUGS-IFG greatly acknowledges and this include the following:

- IUGS Executive Committee.
- Prof Peter Bobrowsky.
- **Commercial companies:** Helford Geoscience LLP (UK), Microtrace LLC (USA), James Hutton Limited and Geoscienze Forensi Italia (Italy), Mala (Mike Langton), Geoforensic and Specialist Search International (GGSI).
- **Police Forces, Law Enforcement and Federal Agencies:** California Department of Justice, Federal Bureau of Investigation (USA), Australian Federal Police (Australia), Washington State Patrol Crime Lab (USA), Abu Dhabi Police (UAE), Russian Federal Centre of Forensic Science (RFCFS) of the Ministry of Justice of Russia (Russia), National Research Institute of Police Science of Japan (Japan), Servizio Polizia Scientifica (Italy), Carabinieri (Italy), Brazilian Federal Police (Brazil), National Crime Agency (NCA) (UK), Police National Search Centre, The College of Policing (UK), Home Office Centre for Applied and Scientific Research (CAST) (UK), Search Technology User Group (STUG) (UK), Greater Manchester Police (GMP) (UK), West Yorkshire Police (UK), South Yorkshire Police (UK), Police Scotland, Inspector Graham Peffers (GMP and NCA), Inspector Colin Hope (NCA) Mike Ferguson (CAST), Nicola West (CAST), Mr Geoff Knuffer MBE (An Garda Síochána Headquarters, Independent Commission for the Location of Victims' Remains).
- **Universities, Research Institutes and Professional Societies:** Geological Society of America (GSA) (Organising Committee for GSA 2018 in Seattle), Dr Matteo Barone and The American University of Rome (Italy), Institute of Forensic Science in China, University of Pretoria (South Africa), Dalhousie University (Canada), National Research Institute of Police Science (Japan), CSIRO (Australia), Centre for Australian Forensic Soil Science (CAFSS) (Australia), Buffalo State College (USA), Queens University Belfast (Northern Ireland), the James Hutton Institute (Scotland, UK), University of Canberra (Australia), University of Technology, Sydney (Australia), University of Keele Department of Earth Sciences (UK), University College London (UK), University of Staffordshire, (UK), University of Pretoria (South Africa), Nacional Institute of Criminalistics (INC) (Brazil), Universidad Antonio Narino Bogota (Colombia), The Geological Society of London (Forensic Geosciences Group) University College London, JDI Centre for the Forensic Sciences, Australian Facility for Taphonomic Experimental Research (AFTER), Institute of Geologists of Ireland, Geological Survey of Ireland, Japanese Society of Geo-pollution Science, Medical Geology and Urban Geology, John Moores University Liverpool, Home Office (CAST), Japanese Society of Geo-Pollution Science, Medical Geology and Urban Geology.

7 INTERACTION WITH OTHER INTERNATIONAL PROJECTS & ORGANISATIONS

Throughout 2017, IUGS-IFG interacted and collaborated with the organisations and projects that included those listed in Table 7.1. This excludes operational support for Police and Law Enforcement case work, which is confidential.

ORGANISATION	TYPE OF INTERACTION	PROJECT/EVENT
January		
Geological Society of London	Publication	Lead article in 'Geoscientist'
Scottish Historical Society	Outreach	Invited speaker
UK Police	Knowledge exchange, capacity building	Search for burials
February		
Geological Society of London	Professional	Corporate Affiliation Scheme
March		
Queens University Belfast, Northern Ireland	Knowledge exchange, capacity building	BSc, MSc and PhD support
John Moores University, Liverpool	Knowledge exchange, capacity building	BSc, MSc and PhD support
Seminario, Geologia Forense, Sicilia, Italia	Knowledge exchange, capacity building, training	MSc course
Geological Society of London	Outreach	Publications Committee
April		
European Geophysical Union	Outreach	Conference
European ENFSI, APST, Budapest, Hungary	Outreach	Conference
International Association for Promoting Geoethics (IAPG)	Professional	MoU agreement for collaboration
May		
East Anglia Regional Group of the Geological Society	Outreach	Invited speaker
Geological Society of London, Forensic Geoscience Group	Knowledge exchange, capacity building	Collaboration
Western Regional Group of the Geological Society	Outreach	Invited speaker
June		
European Taphonomy Research Centre in Amsterdam	Knowledge exchange, capacity building	Collaboration
Home Office Centre of Applied Science and Technology (CAST), Search Technology Users Group (STUG)	Knowledge exchange, capacity building, training	Geological trace evidence, crime scene examination, search for burials and concealed targets
UK Human Decomposition Facility	Knowledge exchange	Collaboration

July		
1st International Defence & Security Canine Conference (IDSCC)	Knowledge exchange, capacity building	Searches for burials
Geological Society's themed event for 2017	Knowledge exchange, capacity building	Year of Risk Sharing an Uncertain World
Australian Federal Police and Geoforensic Search International (GSI)	Knowledge exchange, capacity building	Search Strategy Review for Buried Targets
International Union of Geological Sciences	Publication	Themed issue of 'Episodes'
August		
The 6th European Meeting on Forensic Archaeology took place at The American University of Rome	Knowledge exchange, capacity building	Conference
Forensic Geology in Egypt	Outreach	Collaboration
The Young Professional, Aberdeen	Outreach	Collaboration
September		
Resourcing Future Generations (RFG2018), Vancouver	Planning	Conferee in 2018
China and Institute of Forensic Science, Ministry of Public Security, Division of Trace Evidence Analysis, China	Knowledge exchange, capacity building, Training	Professional
Trace Evidence Working Group (TEWG) of the Asia Forensic Sciences Network (AFSN) Forensic Geoscience, Singapore	Knowledge exchange, capacity building, Training	Professional
October		
Brazilian Federal Police	Knowledge exchange, capacity building	XXIV Brazilian Congress of Criminalistics
Friends of Sherlock Homes	Outreach	Collaboration
Forensic Geology in New Mexico,	Outreach	Invited speaker
UK Police National Search Centre	Knowledge exchange, capacity building	CPD
Geological Society of America, (GSA2018), Seattle	Outreach	Invited speaker
November		
Royal Institution	Outreach	Invited speaker
Abu Dhabi Police	Outreach	Conference
Forensic Geology, Universities of Camerino and Verona	Planning	Course in 2018
Yorkshire Geological Society, Nottingham	Knowledge exchange, capacity building	Invited speakers
Missing Persons Conference, in Sydney	Knowledge exchange, capacity building	Conference

December		
3rd IberoAmerican Seminar on Forensic Geology, La Plata, Argentina with support from the International Association of Mathematical Geoscience (IAMG)	Knowledge exchange, capacity building, training	Conference and training event
Japanese Society of Geo-Pollution Science, Medical Geology and Urban Geology	Knowledge exchange, capacity building	Conference and training event

Table 7.1 Selected examples of IUGS-IFG collaboration with other projects and organisations during 2017

8 MAIN CHIEF ACCOMPLISHMENTS

8.1 JANUARY

8.1.1 Geoscientist^{1,8}

An article on Forensic Geology was published in, 'Geoscientist', The Magazine of the Geological Society of London, to celebrate the 10th Anniversary of the Geological Society of London, Forensic Geoscience Group.

8.1.2 Scottish Historical Society, Edinburgh, Scotland³

IUGS-IFG was represented at the Scottish Historical Society, following an invitation from the Lord Provost. The presentation included the history of forensic geology, ground searches and operational case work examples.

8.1.3 UK Police^{1,3,8,10}

Knowledge exchange meetings were held with a UK police force, to provide forensic geology search strategies and techniques, to locate buried items related to the prevention of terrorism and to locate graves.

8.2 FEBRUARY

8.2.1 Geological Society Corporate Affiliate Scheme¹

IUGS-IFG became affiliated to the Geological Society of London, Corporate Affiliate Scheme. This enables IUGS-IFG to access resources available within GSL.

8.3 MARCH

8.3.1 Queens University Belfast, Ireland^{1,3,8,9}

On 27 March 2017, a series of knowledge transfer events were designed and delivered to BSc students and police practitioners held at QUB, Department of Geology, Geography and Archaeology. This included organic and mineralogical trace evidence in soils, the design of a ground search for burials, giving evidence in court, report writing and operational case studies.

8.3.2 Forensic Anthropology, John Moores University, Liverpool, UK¹

On 9 March 2017, IUGS-IFG were invited to take part in a Forensic Anthropology Alumni Careers Event. This involved the delivery of a presentation to BSc, MSc and PhD students interested in working with police, law enforcement or forensic organisations. IUGS-IFG provided details of the technical, commercial, operation, logistical and personal aspects of working as a forensic geologist. Other presentations were provided by a crime laboratory manager from Merseyside Police, a forensic archaeologists from Cellmark Forensics and an archaeologists involved in the exhumation of war graves.

8.3.3 Forensic Geology, Messina, Sicily, Italy⁸

IUGS-IFG provided technical support and presentations for a course on forensic geology, held at the University of Messina, in Sicily, Italy.

8.3.4 IUGS-IFG Sub-Committee Meeting, London, UK^{1,3,8,9,10}

On 6 March 2017, IUGS-IFG sub-committee meeting was held in London. This considered the actions and minutes from the previous meeting held in Cape Town, in August 2017, and agreed priorities for 2017-2018. Minutes and actions resulting from this meeting were circulated to the IUGS-IFG Committee.

8.3.5 GSL Publications Committee, London, UK^{1,3,8,9,10}

Members of the IUGS-IFG Committee, were invited to Burlington House, the Geological Society of London Headquarters, by the Society's Publications Committee to help celebrate the Society's publications which is supported by the Episodes publication.

8.4 APRIL

8.4.1 European Geophysical Union, Vienna, Austria^{1,2,9,10}

Geoethics was the theme and focus at EGU. Often, the technical and scientific aspect of forensic geology investigation may be the most straightforward, after all, this is what the forensic geologist has been trained to do. The associated geoethical issues can be the most challenging and complex to manage. Generally, forensic geologists are driven to carry-out their research or case work with integrity, honesty and in a manner that is law abiding, professional, socially acceptable and highly responsible. As the science of forensic geology begins to advance around the world it is desirable for IUGS-IFG to establish a standard set of principles, values and to provide an agreed ethical a framework.

8.4.2 European ENFSI, APST, Budapest, Hungary³

IUGS-IFG is represented on the ENFSI APST (Animal, Plant and Soil Traces) working group to develop European guidelines for sample handling. The intention is to align these practises being developed by the two groups.

8.4.3 Agreement for Co-operation Between IAPG & IUGS-IFG^{1,3,18}

IUGS-IFG and the International Association for Promoting Geoethics (IAPG) signed an agreement to promote a coordinated policy for promoting initiatives and events of common interest, such as promoting the spreading of topics dealt with by an association among the members of the other association. In particular, IAPG and IUGS-IFG will promote the involvement of their members in the discussion on ethical and social implications of forensic geology. A joint event has been proposed to be held at the Resourcing Future Generations Congress, (RFG2018), in June 2018, Vancouver, 2018.

8.5 MAY

8.5.1 East Anglia Regional Group of the Geological Society¹

On 4 May 2017, IUGS-IFG delivered an outreach presentation on forensic geology, at the University of East Anglia, in Norwich, UK. Most of the students who attended had no previous knowledge of the application to geology to law enforcement.

8.5.2 Geological Society of London, Forensic GeoScience Group (FGG)¹

IUGS-IFG supported the FGG by providing a supportive statement on international collaboration taken place between the two groups, which was required for the FGG annual report.

8.5.3 Western Group of the Geological Society, Fakes and Fraud⁸

On 6 May 2017, a presentation was delivered for the Western Group of the Geological Society. This provided information on the role of forensic geologists that help investigate fakes and fraud and the range of laboratory techniques that are used during these investigation (e.g. XRD, XRF, SEM, radiocarbon). These crimes may be committed for financial gain (e.g. mining fraud and metals theft) or asthenic appeal (e.g. fake fossils and gems).

8.6 JUNE

8.6.1 European Taphonomy Research Centre in Amsterdam¹

IUGS-IFG provided the Home Office, Search Technology User Group (STUG) with an outline scope for possible collaboration at the European Taphonomy Research Centre in Amsterdam.

8.6.2 Home Office, CAST, STUG, UK^{1,3,6,8,9,10,11}

As part of the UK Governments remit to cut crime and deliver justice, the Home Office Centre of Applied Science and Technology (CAST) is always seeking new possibilities to engage with academia in expanding our ability to protect the public while assisting efficient policing. Over 300,000 people on average go missing each year in the UK alone and many of these are never found. CAST Front Line Services is determined to redress the balance by creating new techniques and equipment for both ground and water search. An academic Research team to work collaboratively with CAST to address gaps in technology or equipment highlighted by the Search Technology User Group (STUG). Members of IUGS-IFG were selected and invited as subject matter experts to participate in this group. Other experts included forensic archaeologists, botanists and chemists. Meetings were held in June and September 2017 to define the objectives, terms of reference, scope, expected timeframes and deliverables. Further meetings are proposed for 2018. One aim will to provide for Police guidance on the applications of geology to help investigate and solve crime and to locate burials.

8.6.3 Human Decomposition Test Facility^{1,3,6,8,9,10,11}

Members of IUGS-IFG were invited to participate on a debate that focused on the technical, practical and ethical issues on a UK Human Decomposition Facility for research purpose (confidential).

8.7 JULY

8.7.1 1st International Defence & Security Canine Conference (IDSCC), Cirencester, UK¹

The 1st International Defence & Security Canine Conference (IDSCC) was held at the Parkinson Theatre, Royal Agricultural University, Cirencester, UK on 11-13 July 2017. This as aimed at predicting canine performance, fundamental training concepts, specialist search dogs such as victim recovery dogs, welfare, canine olfaction and audiology, to name a few examples. Information was provided by IUGS-IFG and this was attended by IUGS-IFG partners in Geoforensic and Specialist Search International (GSSI) and CAST. This provided the basis for research in 2018 aimed at understanding the geological influences on the deployment of detector dogs to locate graves and other burials.

8.7.2 The Geological Society, Year of Risk, Sharing an Uncertain World, London, UK¹

IUGS-IFG co-organised, chaired and presented at the Geological Society's themed event for 2017, 'Year of Risk Sharing an Uncertain World'. This took place on 13-14 July 2017 at Burlington House, in London. IUGS-IFG focussed on the challenges associated with, '*The Communication of Forensic Geoscience*' and '*Forensic Geology Front Line Operational Services for Police and Law Enforcement Investigations and the Evaluation of Associated Risks*'. The event was attended by approximately 100 delegates, which promoted discussion and debate. One of the outcomes of the meeting was the recognition for professional guidance on the communication to non-geologists of contested and challenging geoscience information.

8.7.3 Search Strategy Review, UK, Australia, USA^{1,10}

A meeting was held with IUGS-IFG and representatives working with the Australian Federal Police and Geoforensic Specialist Search International (GSSI). This reviewed innovative search methods, assets and strategies used to locate the grave of a missing person. This included geophysical methods, detector dog searches and the detection of leachate and volatile organic compounds. New research projects were identified to be conducted in 2018.

8.8 AUGUST

8.8.1 6th European Meeting on Forensic Archaeology, Rome, Italy^{8,18}

The 6th European Meeting on Forensic Archaeology took place at The American University of Rome, in Italy, 18-19 August 2017. The event was attended by forensic geologists, geophysicist and archaeologists, the Carabinieri, Italian Police and Ministers. This event provided an update on the

status of forensic archaeology in Europe and opportunities for geological collaboration. IUGS-IFG also presented on preventing art and antiquities crimes using forensic geology.

8.8.2 Forensic Geology in Egypt¹

Initial communications took place with geologists at Cairo University interested to develop forensic geology in Egypt. This became advanced later in 2017 with discussion held at a meeting with the Geological Society of Egypt. Throughout 2018 IUGS-IFG aim to assist with initiating forensic geology interests in Egypt.

8.8.3 The Petroleum Geology Young Professional, Aberdeen³

IUGS-IFG were invited to give a presentation on forensic geology to the Young Professionals organisation, in Aberdeen, Scotland.

8.9 SEPTEMBER

8.9.1 Planning for Resourcing Future Generations (RFG2018), Vancouver, 2018^{1,2,3,6,8,9,10,26}

IUGS-IFG agreed to collaborate with the University of Canberra, National Centre Forensic Studies, to hold a course on forensic provenancing at RFG, in Vancouver, June 2018. The Australian Federal Police have also agreed in principle to support this course.

8.9.2 Institute of Forensic Science, Division of Trace Evidence Analysis, China^{1,2,29}

IUGS-IFG developed a knowledge exchange event in China. In September 2017, this included a series of forensic geology workshops (Appendix II).

8.9.3 Forensic Geoscience, Singapore²

IUGS-IFG developed a knowledge exchange event in Singapore. In September 2017, this included a series of forensic geology workshops (Appendix II).

8.10 OCTOBER

8.10.1 Scientific Committee of the XXIV Brazilian Congress of Criminalistics^{16,17}

IUGS-IFG continued to build on the work we have completed in Latin America since 2009, developing forensic geology. This XXIV Brazilian Congress of Criminalistics was a natural extension and continuation of forensic geology training delivered in Brazil in previous years.

8.10.2 Friends of Sherlock Homes Group, Seattle, USA¹

On 25 October 2017, IUGS-IFG attended a dinner with the Friends of Sherlock Homes Group and subsequently became affiliated with the group. The group celebrates the life and stress of Sir Arthur Conan Doyle and Sherlock Homes, which referred to the use of geology to help solve crime.

8.10.3 IUGS E Bulletin

IUGS-IFG provided articles to IUGS for publication in the IUGS on line E-Bulletin. This included the development of forensic geology in Asia and IUGS-IFG representation at the GSA congress in Seattle.

8.10.4 New Mexico, USA¹⁴

IUGS-IFG was represented in New Mexico, USA, where an outreach presentation was delivered on forensic geology.

8.10.5 Police National Search Centre, UK¹

IUGS-IFG provided material to assist with CPD training on searches to locate burial held at the PNSC, UK.

8.10.6 Geological Society of America, Seattle, USA¹

On 25 September 2017, IUGS-IFG Chair was invited to deliver a presentation at the Geological Society of America Congress (GSA2017) in Seattle, on; *'Forensic Geology: The Applications of Geology to Police and Law Enforcement'*. This formed part of the series of *'Feed Your Brain'* lunch time sessions organised by GSA that was for the first time simultaneous broadcasted on the internet, and attended by members of the IUGS Executive Committee.. This presentation focused on the application of geology to policing and law enforcement, which may potentially be applicable to a court of law. He provided examples and cases on how forensic geologists provide advice and support in relation to: serious crimes (homicide and sexual assaults), organized crime, counter terrorism, kidnapping, humanitarian incidents, environmental crimes, wildlife crime, precious minerals, illegal mining, metals and minerals theft, fraudulent crimes, fakes and search.

8.11 NOVEMBER

8.11.1 Royal Institution, London, UK³

IUGS chair was originally invited to give a presentation to the Royal institution in London. However, due to a clash of events this was provided by IUGS Treasurer on 1 November 2017. The presentation was well received.

8.11.2 Abu Dhabi^{1,22}

In 2017 Captain Khudooma Said Al Naimi (IUGS-IFG Officer for UAE) visited the UK to become familiarised and updated with latest applications of forensic geology and forensic archaeology. This was followed by a seminar on forensic geology in Abu Dhabi and continuing IUGS collaboration in Abu Dhabi since 2013.

8.11.3 Forensic Geology, Universities of Camerino and Verona, Italy¹⁸

Following on from the earthquake in 2016 that damaged buildings at the Universities of Camerino and Verona, IUGS-IFG has been invited to support the establishment of a postgraduate master courses in forensic geology. IUGS-IFG has offered to endorse and support this course during 2018.

8.11.4 Yorkshire Geological Society, British Geological Survey^{1,8}

IUGS-IFG took part in a one day event on forensic geology that was organised by the Yorkshire Geological Society. This was held at the British Geological Survey's headquarters, in Nottingham, UK and in conjunction with BGS and the Geological Society of London, Forensic Geoscience Group (FGG). An aim of the event was to demonstrate to other geologist how geological techniques may be applicable to police and law enforcement investigations.

8.11.5 Missing Persons, Sydney, Australia¹⁰

IUGS-IFG were represented at the National Missing Persons Conference, in Sydney. The event was called, *'Missing Persons: Challenges and Opportunities'* and it took place on 15-17 November 2017. An overview on search strategies developed by IUGS-IFG were presented.

8.12 DECEMBER

8.12.1 3rd IberoAmerican Seminar on Forensic Geology, La Plata, Argentina^{1,3,9,15,16,17,18,26}

The 3rd IberoAmerican Seminar on Forensic Geology, was held from 30 November to 1 December 2017, and with support from the International Association of Mathematical Geoscience (IAMG). This follows on from the success of the 1st event, held in Colombia in 2009 and the 2nd event held in Brazil in 2013. More than 200 delegates attended from at least 10 countries. Themes included; forensic soil evidence; the judicial system and laboratory data; forensic palynology and mycology; minerals and gem fraud in Amazon, Brazil; mineral fraud and money laundering; GIS and forensic geology; search for missing persons; forensic geology applied to the forced disappearance of missing persons in Argentina;

identification of people and human remains and geological knowledge applied to burials and crime resolution. A booklet of abstracts was produced with its publication in 2018. A committee meeting was held to discuss priorities for 2018 and minutes were produced (Appendix III).

8.12.2 Forensic Geology in Japan²⁴

IUGS-IFG collaborated in Japan with the Japanese Society of Geo-Pollution Science, Medical Geology and Urban Geology at the, 27th Symposium on Geo-Environmental and Geo-technics, which was held on 1-2 December 2017, in Japan. This continues the work of developing forensic geology in Japan and reaching out to new and related fields.

9 MAIN PRODUCTS AND OTHER ACTIVITIES IN 2017

9.1 Confidential Documents and Operations

IUGS-IFG committee members were contacted by the Police to provide advice, guidance and assistance with operational cases related to homicide, sexual crimes, environmental crimes, searches for graves and other items associated with organised crime and counter terrorism. Due to their confidential status details are not contained in this annual report.

9.2 Training Documents

IUGS-IFG produced power-point presentations and information for training courses held in Sicily, China, Singapore Brazil, UK and Argentina, which included IUGS and IFG logos.

9.3 Website

The IUGS IFG web site is proposed to become upgraded and updated in 2018. This will be professionally commissioned at a cost to be confirmed, but estimated to be around \$USD 3000.

This has been agreed by the IFG Committee to be commissioned by a sub-consultant based in Australia.

Once established the web site will be managed by Alastair Ruffel and Jennifer McKinley at Queens University Belfast, Northern Ireland.

9.4 Flyer

The IUGS-IFG flyer it was issued around the world throughout 2017.

9.5 Geoforensic International Network (GIN)

GIN brings together forensic geologists, geoscientists and police/law enforcement officers from around the world to develop and promote forensic geology.

Those countries now represented in GIN include; Australia, Argentina, Belgium, Brasil, Canada, China, Colombia, Egypt, England, France, Germany, Hungary, India, Iran, Ireland, Italy, Japan, Malta, Mexico, Namibia, New Zealand, Nigeria, Northern Ireland, Portugal, Russia, Scotland, South Africa, Spain, Sweden, Switzerland, Netherlands, United Arab Emirates, United States of America, Wales and the West Indies (Caribbean). Targeted countries for potential membership: Belarus, Greece, Kazakhstan, Kyrgyzstan, Kuwait, Mongolia, Oman, Qatar, Poland, Venezuela and Malaysia.

9.6 Awards & Recognition

Prof Lorna Dawson was received a Pride of Britain Award Special Recognition award for her dedication to forensic soil science, assisting police in their case work and in the effective communication of forensic geoscience. This was presented to Lorna in London and broadcasted on national television and available on YouTube in November 2017. This award celebrates the achievements of remarkable people who make our world a better place.

Dr Rosa Maria di Maggio and Pier Matteo Barone were presented with the Italian Investigation and Forensic Award for their excellence in Forensic Geology. The award was organised by the Italian Forensic Associations and Forensic Magazines with a panel including experts from national law enforcement, forensic police departments, crime journalists, academic professors and lawyers.

Dr Jennifer McKinley received the Steminit Award set up to celebrate 70th Anniversary of the Geological Survey of Northern Ireland (GSNI). It was awarded to acknowledge Jennifer's strategic partnership with GSNI and international networking including both IFG and IAMG.

Microtrace LLC, USA, celebrated its 25th Anniversary. It was established by Skip Palenik in 1992 and has grown to become a globally recognised state-of-the art microanalytical laboratory and Chris Palenik, his son, now works there.

9.7 Certificates

IUGS-IFG certificates were issued to delegates who attended forensic geology training in China Singapore, Argentina and Brazil.

9.8 Newsletter

IUGS-IFG published a newsletter in June 2017, which was subsequently issued and circulated globally.

9.9 Media

The work of the IUGS IFG members raised considerable media interest over the year, with features in broadsheets and tabloids and radio and TV interviews.

10 PUBLICATIONS

10.1.1 Special Publication on Forensic Soil Science and Geology, Cape Town

A proposal was accepted by the Geological Society of London (GSL) to publish full papers from the 2016 congress in Cape Town as a 'Special Publication'. This title is, '*Forensic Soil Science and Geology*'. The editors are Rob Fitzpatrick and Laurance Donnelly, with publication expected in 2018.

10.1.2 Guide to Forensic Geology

Throughout 2017 IUGS-IFG progressed the writing of, '*A Guide to Forensic Geology*'. The final draft is expected in 2018 for peer review and publication.

10.1.3 Episodes

In July 2017, IUGS-IFG published for the first time a themed issue of '*Episodes*' (Journal of the International Union of Geological Sciences) on forensic geology, IUGS-IFG Chair was the special guest editor. The contents were as follows:

- Section 1: Introduction: The Episodes Themed Issue on Forensic Geology and the International Union of Geological Sciences (IUGS), Initiative on Forensic Geology (IFG)
- Section 2: Ground searches for Graves and Buried Targets Related to Homicide, Terrorism and Organised Crime
- Section 3: Geology of the FBI Lab and the Challenge to the Admissibility of Forensic Geology in US Court
- Section 4: Global Developments in Forensic Geology
- Section 5: The role of Forensic Geology in Illegal Precious Metals Trade
- Section 6: Forensic Geolocation: Forensic Soil Analyses for Provenance Determination
- Section 7: The Role of Pedology and Mineralogy in Providing Evidence for 5 Crime Investigations Involving a wide Range of Earth Materials
- Section 8: Soil Organic Characterisation in Forensic Case Work

- Section 9: The Application of Application of Geographic Information System (GIS) in Forensics Geoscience
- Section 10: International Case in Forensic Geology; Fakes, Fraud, Homicide and Environmental Crimes

10.1.4 Geoscientist at Crime Scenes

Rosa Maria Di Maggio and Pier Matteo Barone published, *'Geoscientist at Crime Scenes'* (Springer) and invited the preface to be written by the IUGS-IFG Chair. *'Geoscientists at Crime Scenes'* is the first book of its kind to be published in Italy specifically dedicated to the multi-disciplinary subject of forensic geology. Originally published in Italian, in 2013, *'Geologic Forensic: Introduzione alle Geoscienze Applicate alle Indagini Giudiziarie'*, has hereby been translated into the English language. This provides the opportunity for the global dissemination of a wealth of information on forensic geology.

11 MAIN PROBLEMS ENCOUNTERED IN 2017

11.1 Funding

IFG is reliable on the core funding provided by IUGS. This remains essential so that the ground can continue to develop forensic geology around the world.

11.2 Competence, Accreditation, Regulation

IUGS-IFG continues to explore opportunities and debate the accreditation and regulation of forensic geology.

11.3 Alignment and Compliance with Forensic Science

IUGS-IFG is seeking to align and comply with standard forensic science best practise and guidance.

11.4 Confidentiality

IUGS-IFG cannot report all of the events and work it undertakes due to its sensitive and confidential nature and ongoing operational case work.

12 SUMMARY OF EXPENDITURES IN 2015

12.1 Bank Account & Management

The IUGS-IFG bank account remains in Aberdeen, Scotland, and is managed by the IUGS-IFG Treasurer. Prof Lorna Dawson and accounts verified by Dr Laurance Donnelly.

12.2 Summary of Accounts

The income and expenditure on the account for 2017 is summarised in Table 12.1. As the IUGS-IFG bank account is held in the UK, the income and expenditure is shown in £ sterling and \$USD equivalent.

EVENT IN 2017	CREDIT/INCOME(£)	DEBIT (£)	BALANCE (£)
'Guide' publication*		188	646
Canada*		700	833
Germany*		254	1,533
Web site costs*		360	1,787
Web site upgrade*		2,250	2,147
Bank costs		15	4,397
Argentina		7,300	4,412
EGU, Europe		47	11,712
Bank costs		27	11,759
European		784	11,786
IUGS award	6,045		12,570
London		1,782	6,524
Brazil		1,620	8,304
Carry Over from 2016			9,114
Balance for 2017 (£)			646

Notes:

1. The above balances includes bank charges for international transactions.
2. * Denotes anticipated transactions in the first quarter of 2018.
3. Balance for end of 2017 is **£646 or USD\$ 871.84**.
4. Exchange rate 1 GBP = 1.35 USD and 1USD = 0.74 GBP (source: xe.com on 11th January 2018).

Table 12.1. Summary of IUGS-IFG Accounts for 2017-2018

13 WORK PLAN FOR 2018

The objectives for 2018 and beyond are to implement recommendations for the review conducted by IUGS ARC, and including the following:

- i. Focus on marketing and publication of the work undertaken by IUGS-IFG,
- ii. Outreach knowledge transfer and targeted training events;
- iii. Forensic geology session at Resourcing Future Generations (RFG2018), in Vancouver, and collaboration with the International Association for Promoting Geoethics (IAPG);
- iv. Assign committee member for south east Asia;
- v. Update and upgrade the IUGS-IFG web site and transfer of operations from Canada to Northern Ireland;
- vi. Publication of, '*Geological Special Publication on Forensic Geology and Soil Forensics*';
- vii. Publication of, '*A Guide to Forensic Geology*';
- viii. Develop forensic geology in India;
- ix. Attract audiences in harder to reach communities, such as developing nations and young people especially in 2018, the year of the young person;

- x. Enhance accessibility to IFG materials through translation and distribution internationally and via the new IUGS-IFG web site;
- xi. Engagement with forensic science regulators to align forensic geology with forensic science;
- xii. Upgrade the IUGS-IFG web site and enhance visibility;
- xiii. Assist police and law enforcement and develop guidance and best practise in forensic geology globally; and
- xiv. IFG will be represented in China, by Dr Jennifer McKinley.

14 CRITICAL MILESTONES

Critical milestones for 2017 included the following:

- Publication of a themed issue on Forensic Geology in *'Episodes'*;
- Publication of a themed issue on Forensic Geology in *'Geoscientist'* (Magazine of the Geological Society of London);
- Advancement of the draft on *'A Guide to Forensic Geology'* and agreement for this to be published by The Geological Society of London;
- Commission the upgrade of the IUGS-IFG web site;
- Key presentation at the Geological Society of America Congress in Seattle, USA
- Provision of expertise and support to the Police and Law Enforcement on operation case work;
- Successful initiation of forensic geology in Asia and parts of Latin America and the organisation of the forensic geology training and knowledge exchange events in China, Singapore and Argentina
- Successful organisation of the forensic geology session at the 35th IGC in Cape Town attended by over 100 delegates; and
- Provision of operational forensic geological support for several serious crimes.

15 ANTICIPATED OUTPUTS TO BE ACHIEVED FOR 2018

The main outputs expected for 2018 include the following:

- Publication of *'Forensic Soil Science and Geology'*, a Geological Society of London Special Publication (including key papers from Forensic Geology session, held at the 34th International Geological Congress, Cape Town);
- Circulation of the draft manuscript, *'A Guide to Forensic Geology'* for peer review and approval for publication;
- Delivery of forensic geology training, knowledge transfer and outreach events;
- Upgrade and modernisation of the IUGS-IFG web site;
- Development of guidance and best practise in forensic geology for police and law enforcement; and
- Global distribution of the IUGS-IFG newsletter and flier.

16 BUDGET FOR 2017

In 2017, IUGS-IFG was successful in attracting additional financial support and support in kind to assist with international events. IUGS-IFG will continue to request and obtain contributory funding and funding services in-kind, however this relies on the core funding that is provided by IUGS. This approach is expected to provide a basis and for the continued global development and advancement of forensic geology.

In addition, in kind contributions by IUGS IFG staff time and the organisation they work in has allowed the many and varied contributions to have been achieved.

In 2018, IUGS-IFG proposes to generate a small surplus for events in 2019 or to break even.

IUGS-IFG would request that we can ‘roll forward’ the current balance of USD\$ 871 to support events already agreed in 2018.

IUGS-IFG kindly requests the maximum available budget of USD\$ 15,000 funding from the IUGS Executive Committee for 2018 so IFG can continue to deliver the recommendations provided by the IUGS ARC in 2016 and proposed 2018 programme.

17 SELECTED REFERENCES

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APPENDIX I: SELECTED PHOTOGRAPHS AND ASSOCIATED INFORMATION



(Left) Special issue of 'Geoscientist', The magazine of the Geological Society of London, Forensic Geoscience Group to celebrate its 10th Anniversary. (Right) Episodes, special themed issue on Forensic Geology.



(Left) 3rd IberoAmerican Seminar on Forensic Geology, held in La Plata, Argentina. (Right) Forensic Geology Presentation for the 'Young Professionals', in Scotland, August 2017.

FORENSIC GEOLOGY AND GEOETHICS

Dr Laurance Donnelly^{1*}, Prof Lorna Dawson^{2*}, Dr Alastair Ruffell^{3*}, Dr Jennifer McKinley^{4*}, Dr Rosa Maria Di Maggio^{5*}, Dr Duncan Pirrie^{6*}, Commander Mark Harrison^{6*}, Prof Sue Grayston⁷

IUGS INITIATIVE ON FORENSIC GEOLOGY (IFG)	GEOETHICS	CORE VALUES AND CODE OF CONDUCT
<p>IUGS-IFG¹ was set up in 2011 to promote and develop the applications of geology (e.g. soil textural analysis, alkane analysis) to policing and law enforcement throughout the world.</p> <p>This includes assisting with searches to locate graves or items of interest that have been buried beneath the ground surface as part of a criminal act, and with the analysis of geological trace evidence found on items connected to a crime.</p> <p>It also includes the provision of trace evidence analysis and presentation of evidence in court.</p> <p>Forensic geologists may also assist law enforcement in other ways including; homicide, sexual assaults, counter terrorism, kidnapping, humanitarian incidents, environmental crimes, precious minerals theft, fakes and fraudulent crimes.</p>	<p>If the forensic geoscientist has the relevant technical and scientific training, expertise and contacts, such as through the IUGS IFG, the analysis can be the most straightforward part of the work we do. The associated geoethical issues can be the most challenging and complex to manage. Forensic geologists are required to carry out their research or case work with integrity, honesty and in a manner that is law-abiding, professional, socially acceptable and highly responsible.</p> <p>As the science of forensic geology begins to advance around the world it is desirable to establish a standard set of principles and values and to provide an agreed, ethical framework.</p> <p>Many of our cases involve both living and deceased humans, all assessments are conducted with extreme respect and dignity.</p>	<p>Establishing standards, guidelines and protocols in forensic geology is central to our mission.</p> <p>Our principles include: Integrity, accountability, honesty, professional fairness, courtesy, trustworthiness, data-sharing and information transparency, education and training, multi-disciplinary collaboration, development of research, fair debate, evaluating uncertainty and risk, regulation and accreditation, effective communication and diplomacy, presenting evidence in courts of law and elimination of potential bias.</p> <p>The uptake of Forensic Geoscience brings with it considerable challenges arising from the direct and often very sensitive human interactions. By developing this ethical component to the work that IUGS-IFG undertakes, combines scientific and technical approaches with sensitive solutions, and also, in parallel, helps define an ethical framework for forensic geoscientists' research and practice in addressing these challenges.</p>

¹International Union of Geological Sciences (IUGS), Initiative on Forensic Geology (IFG); ²Chair, IUGS-IFG, Arup, 3 Piccadilly Place, Manchester, UK; laurance.donnelly@arup.com; geologist@hotmail.co.uk; ³James Hutton Institute, Aberdeen, UK; ⁴Queens University Belfast, Northern Ireland, UK; ⁵Geoscienze Forensi Italia; ⁶University of South Wales, Treforest, UK; ⁷Australian Federal Police & University of Canberra, Australia; ⁸University of British Columbia, Vancouver, Canada

Forensic Geology and Geoethics poster displayed at the EGU General Assembly 2017, 26 April 2017, Vienna, Austria.

International Defence & Security Canine Conference

11th-13th July 2017
Royal Agricultural University, Cirencester, UK

International event on the deployment of detector dogs, Cirencester, July 2017, Cirencester, UK.

6th European Meeting on Forensic Archaeology
EMFA 2017
August 18-19 2017 - Rome, Italy

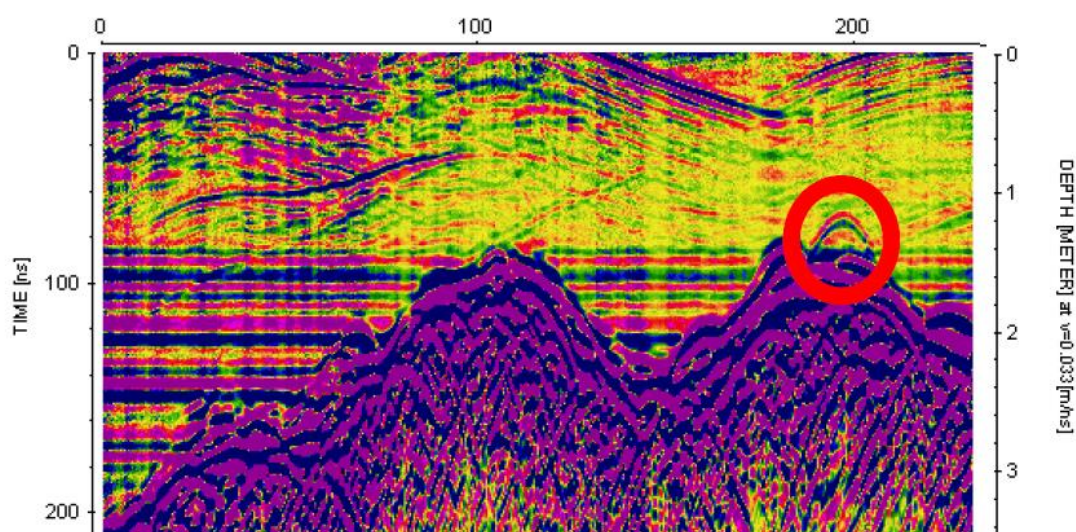
IUGS-IFG supported and endorsed the 6th European Meeting on Forensic Archaeology, August 2017, Rome, Italy.



Members of the IUGS-IFG Committee, were invited to Burlington House, Geological Society of London Headquarters, by the Society's Publications Committee, March 2017.



IUGS-IFG Chair delivering an invited presentation on forensic geology at Geological society of America (GSA), Seattle, September 2017.



Water Penetrating radar 2D profile used in the search for submerged gun parts. A hyperbola was observed where the main stock of the weapon and other parts were recovered (source: A. Ruffell and R. Parker)

The Geological Society
serving science & profession

Western Regional Group

Geological Fakes and Frauds
Dr Alastair Ruffell, Queen's University Belfast
The Hub, Aztec West, Bristol, BS32 4RZ
Tuesday 9th May 2017. Refreshments at 6pm for a 6:30pm Start

The Western Regional Group is pleased to invite Dr Alastair Ruffell from Queen's University Belfast. During this talk, Alastair will be sharing his experience using Earth science techniques in forensics for the search of hidden objects and trace evidence analysis, and how systems of valuation are affected by fraud.

Some geological fakes and frauds are carried out solely for financial gain (mining fraud), whereas others may be for increasing aesthetic appeal (faked fossils) or academic advancement (fabricated data) as their motive. All types of geological fake or fraud can be ingenious and sophisticated.

Fake gems, faked fossils and mining fraud are common examples where monetary profit is to blame; nonetheless these may impact both scientific theory and the reputation of geologists and Earth scientists.

The substitution or fabrication of both physical and intellectual data also occurs for no direct financial gain, such as career advancement or establishment of belief (e.g. application of geoforensic techniques helps the scientific community to detect such activity, which ultimately undermines scientific integrity).


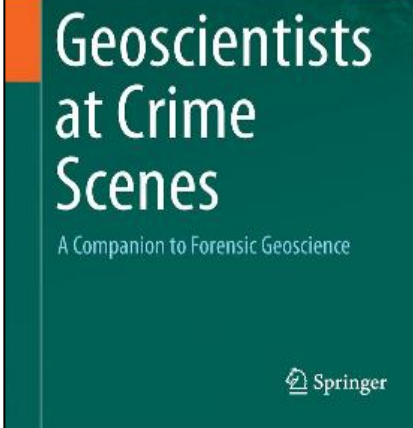
This interactive talk will introduce forensic geology and then demonstrate with a series of case studies the application of this discipline to the history of, and investigation into, fakes and frauds. These will include geological crimes committed for purely financial gain (oil/gas, water, gems/precious metals) and academic fakes, especially fossils. Fakes and frauds that use analyses familiar to geologists will be considered (XRD, FTIR, SEM, radiocarbon) in archaeology, antiques, paintings and manuscripts. We will end with the weird and wonderful – geological frauds and fakes that were the result of non-scientific belief, academic rivalry and probably pure madness, but the audience can reserve judgement on the latter or indeed all of the above.




Soil Forensics

Rosa Maria Di Maggio
Pier Matteo Barone *Editors*

Geoscientists at Crime Scenes
A Companion to Forensic Geoscience

Springer

(Left) Presentation on the role of forensic geology to investigate fakes and fraud. (Right) Geoscientist at Crime Scenes published in 2017.




Prof Lorna Dawson, in the Pride of Britain Awards Magazine, October 2017 and receiving her award.




The Steminist Award, presented to Dr Jennifer McKinley.



Rosa Maria di Maggio and Pier Matteo Barone presented with the Italian Investigation and Forensic Award for their excellence in Forensic Geology.



**YORKSHIRE
GEOLOGICAL
SOCIETY**



RECENT DEVELOPMENTS IN GEOFORENSICS

(Joint meeting with the East Midlands Geological Society)

Saturday 11th November 2017, 1:45pm – 5:00pm

British Geological Survey, Keyworth, Nottingham NG12 5GG

<http://www.bgs.ac.uk/contacts/sites/keyworth/home.html>

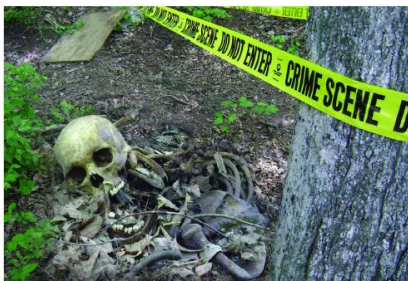


Image Courtesy Laurance Donnelly

Yorkshire Geological Society
Registered Charity No. 220014
www.yorkgeosoc.org.uk

Yorkshire Geological Society, Recent Developments in GeoForensics, November 2017, British Geological Survey, Nottingham, UK

- ▶ **主催**：社会地質学会(旧称：地質汚染－医療地質－社会地質学会)
- ▶ **共催**：日本地質学会、日本情報地質学会、日本鉱物科学会、
日本第四紀学会、内閣府認証(NPO)法人日本地質汚染審査機構、
International Union of Geological Sciences Initiative on Forensic Geology (IUGS-IFG)
Japan chapter of International Medical Geology Association(IMGA)
- ▶ **第27回環境地質学シンポジウムプログラム** (11/28更新)
- ▶ **発表申し込み期日**：2017年9月27日 **2017年10月4日(延長)** ⇒ 報告発表登録及び論文集投稿要領 参照
- ▶ **報告発表原稿期日**：2017年10月11日(厳守)
- ▶ **開催日**：2017年12月1日(金)・2日(土)
- ▶ **場所**：日本大学文理学部 **オーバルホール(図書館3階)**

最寄駅：京王線「下高井戸駅」もしくは「桜上水駅」会場まで各駅から徒歩8分 **地図HP参照**

会費 等 C.P.D.単位 募集講演論文内容 報告発表登録 論文集投稿要領 論文集掲載広告について

IUGS-IFG at the 27th Symposium on Geoenvironmental and Geo-Technics, 1-2 December 2017, organised by the Japanese Society of Geo-Pollution Science, Medical Geology and Urban Geology, in Japan.



Università di Camerino
Scuola di Scienze e Tecnologie
a.a. 2017/2018



Associazione
Italiana
di Geografia Fisica
e Geomorfologia



Geoscienze
Forensi Italia
Forensic
Geoscienze Italy



Master universitario II livello in Geologia forense e illeciti ambientali

Camerino gennaio - dicembre 2018
Polo di Scienze della Terra - via Gentile III da Varano



FINALITÀ ED OBIETTIVI

Il percorso didattico formativo si prefigge l'obiettivo di formare esperti che abbiano competenze tecnico-scientifiche nell'ambito dei reati e degli illeciti ambientali e dotati di elevate capacità tali da consentirgli di risolvere le problematiche tipiche della Geologia Forense e di affrontare e discutere perizie e consulenze come consulente tecnico d'ufficio (C.T.U.) nei procedimenti civili, o come perito/consulente nei procedimenti penali. Il Corso rappresenta il corretto equilibrio tra teoria e pratica, poiché oltre alla trattazione della normativa di riferimento sottopone ai discenti casi e situazioni concrete, con analisi e discussione di casi pratici, ed elaborazione di esercitazioni. Gli esperti in Geologia Forense pertanto sapranno applicare i percorsi metodologici e le procedure analitiche e le tecniche geoambientali più opportune avendo acquisito conoscenze e competenze in campo tecnico-scientifico e di giuridiche.

SVOLGIMENTO E DIDATTICA

Il Master comprenderà attività didattiche e pratico-formativa, articolata in modo da assicurare una alternanza di sessioni didattiche, studio e ricerca, e strutturata in lezioni frontali, seminari, laboratori ed esercitazioni a contenuto professionalizzante, case studies settoriali, eventuali visite presso vari laboratori dell'Ateneo o strutture ad esso esterne consortate, attività di approfondimento individuale, gruppi di lavoro, un periodo per la preparazione della tesi finale, per lo studio individuale degli insegnamenti somministrati, e per lo stage obbligatorio.

Le lezioni saranno tenute in lingua italiana o anche in lingua inglese, ed il materiale didattico sarà fornito in lingua italiana o inglese. Durante il corso, gli allievi dovranno sostenere un colloquio in lingua inglese.

Dopo aver sostenuto gli esami dei 4 Moduli Didattici, è prevista la discussione di una tesi finale, il cui argomento sarà approvato dal Direttore del Master e dal Comitato Tecnico-Scientifico, e la cui discussione avverrà, preferibilmente, entro la fine dell'anno accademico e, comunque entro i termini prescritti dall'Università.

La valutazione finale (discussione della tesi) viene espressa in termini di idoneità.

È richiesta la **frequenza obbligatoria** a ciascun modulo didattico ed allo stage (comprensivo dell'attività seminariale), con una percentuale massima di assenze pari al 25% delle ore di attività totali previste.

Le lezioni si terranno generalmente ogni ultima settimana del mese (dal lunedì pomeriggio al venerdì mattina compreso, per un impegno giornaliero di 8 ore ed un impegno settimanale totale di 40 ore) presso il Polo di Scienze della Terra dell'Università degli Studi di Camerino (via Gentile III da Varano, snc, 62032 - Camerino).

TABELLA MODULI DIDATTICI ED INSEGNAMENTI

Il Master (60 cfu pari a 1500 ore) è organizzato in:

Moduli Didattici (45 CFU di cui 360 ore frontali e 560 ore di studio individuale)

Stage (12 CFU pari a 300 ore di attività pratico-formativa ed attività seminariale)

Lavoro autonomo (765 ore)

Prova finale (3 CFU, pari a 75 ore)

I Modulo GIURISPRUDENZA E CRIMINALISTICA	CFU totali 12
II Modulo GEOMORFOLOGIA E GEOPEDOLOGIA FORENSE	CFU totali 13
III Modulo GEOCHIMICA AMBIENTALE E LABORATORI TECNICO-SCIENTIFICI	CFU totali 16
IV Modulo TERRENI FORENSI E GEOGNOSTICA	CFU totali 4
Tirocinio	CFU totali 12
Tesi	CFU totali 3

REQUISITI D'ACCESSO

Possono partecipare al Master occupati, disoccupati e inoccupati che sono in possesso della laurea magistrale in Scienze Geologiche, Scienze Naturali, Scienze Ambientali, Scienze Forestali ed Agronomiche e Scienze chimiche o titolo equiparato ovvero laurea conseguita in base al precedente ordinamento. Non può iscriversi al master chi già iscritto, in questo anno accademico, ad un corso di laurea, master, scuola di specializzazione, dottorato di ricerca o altro corso di impegno annuale (Legge 270/04, art. 5, c. 2).

TERMINE PRESENTAZIONE DOMANDA DI ISCRIZIONE

20 dicembre 2017

NUMERO CORSISTI AMMESSI

Numero minimo 15

QUOTE DI ISCRIZIONE:

Quota intera	€ 3.000,00
Quota ridotta del 20% per portatori di handicap o Pubblici Dipendenti	€ 2.400,00

UDITORI

I laureati non iscritti al Master possono essere ammessi alle singole attività didattiche fino ad un massimo di n. 3, versando il totale delle quote previste:

I Modulo Didattico	€ 960,00
II Modulo Didattico	€ 1.040,00
III Modulo Didattico	€ 1.280,00
IV Modulo Didattico	€ 360,00

DIRETTORE DEL MASTER

Prof. Piero Farabollini
tel. 0737 402627 (centralino) - 320 4381270 - email: piero.farabollini@unicam.it

COMITATO TECNICO-SCIENTIFICO

Maggiore Geologo Simone Di Donato - Arma dei Carabinieri - CUTFAA

Dott.ssa Rosa Maria Di Maggio - Geoscienze Forensi Italia

Prof. Francesco Dramis - Uniroma3

Dott. Maurizio d'Orefice - ISPRA

Dott. Roberto Gracioti - ISPRA

Dott. Marco Matarazzi - UNICAM

Dott.ssa Cinzia Marucci - Ordine Geologi delle Marche

Dott. Maurizio Miranda - Ordine Avvocati delle Marche

Prof. Gilberto Pambianchi - UNICAM

Dott. Alfonso Russi - Tecnovia srl

Dott.ssa Francesca Testella - UNIMC

Dott. Mauro Tiberi - Regione Marche

Dott. Giorgio Zampetti - Legambiente

SEGRETERIA ORGANIZZATIVA

Dott. Domenico Aringoli
tel. 0737 402616 - email: domenico.aringoli@unicam.it

Tutte le informazioni utili sono reperibili al sito:

<http://www.unicam.it/offerta-formativa/master>



HR EXCELLENCE IN RESEARCH

Flier for proposed master degree in Forensic Geology, University of Camerino, Italy.

APPENDIX II: FORENSIC GEOLOGY IN ASIA

The International Union of Geological Sciences (IUGS), Initiative on Forensic Geology (IFG) was established in 2011 to promote and develop forensic geology around the world, to Police and Law Enforcement. Significant progress has been made most regions of the world, however, the development of forensic geology in Asia has been less advanced, with some exceptions.

The Asian Forensic Sciences Network (AFSN) (Japan is not a member), founded in 2009 provided an opportunity for forensic organisations to develop and advance. In Japan soil examination and trace evidence related to crime became established after the Second World War. This was based on the procedures of the Association of Official Agricultural Chemists, renamed the Association of Official Analytical Chemists after 1965 (AOAC). This was provided by the members of the Scientific Crime Detection Laboratory of National Rural Police Headquarters, a precursor institute of the National Research Institute of Police Science, Japan, as early as 1950. Procedures were established for the geological analysis of soils in a forensic capacity. Forensic sciences in general has progressed at different rates throughout Asia. In 2015, IUGS-IFG held a forensic geology event in Japan at the International Symposium on the Development of Forensic Geology, 122nd Annual Meeting of the Geological Society of Japan, at Nagano, in Japan, in collaboration with the Japanese Society of Geo-Pollution Science, Medical Geology and Urban Geology. This was the first in Japan to focus on forensic geology. In addition to forensic geologists, delegates were mostly from Japan and included the Japan Coast Guard Academy, Research Institute of Environmental Geology of Chiba Prefecture, Kagoshima University and Oxford Instruments, and others from south-east Asia and Japan (Figure 1).



Fig 1. Poster relating to forensic geology in Japan and phot of IUGS-IFG & the International Symposium on Development of Forensic Geology, 122nd Annual Meeting of the Geological Society of Japan.

China is a country IUGS-IFG has been targeting for number of years in terms of developing forensic geology. IUGS-IFG visited China in 2014 and 2015 to develop opportunities. At the 35th International Geological Congress, in Cape Town, in 2016, a meeting was held with Prof Guo Hongling and two of her colleagues from the Institute of Forensic Science, Ministry of Public Security, Division of Trace Evidence Analysis, in China. Prof Hongling works closely with the Police and she was subsequently granted permission to formally engage with IUGS-IFG. Prof Guo Hongling subsequently became

affiliated to the IUGS-IFG Committee as the officer for China. Prof Hongling and Dr Laurance Donnelly subsequently began the planning for a knowledge exchange event in China (Figure 2).



Fig. 2. IUGS-IFG welcomes colleagues from China to the forensic geology session, 35th IGC Cape Town (Photo: Dr Laurance Donnelly).

Professor Rob Fitzpatrick, Centre for Australian Forensic Soil Science (CAFSS) presented a series of four lectures on using morphology, mineralogy and chemistry of soil and geological materials for making forensic comparisons between samples. Rob presented a wide range of 6 case studies conducted by CAFSS. This included a case study from China in 2005 entitled: “Comparison of illegal dinosaur nest materials from imported samples with reference samples provided by the Victorian and South Australian museums sourced from Henan Province, China”. Rob concluded the lecture series with a PowerPoint prepared by Dr Laurance Donnelly, giving an overview of the International Union of Geological Sciences (IUGS), Initiative on Forensic Geology (IFG).

Rob Fitzpatrick had detailed discussions with participants in the laboratory about the use of standard soil morphology methods to describe soils, as well as X-ray diffraction (XRD) and X-ray fluorescence (XRF) analysis methods for soil analyses. An arrangement has been made to send CAFSS a representative set of five complex soil and geological samples from China for XRD analyses. The mineralogical results of the 5 Chinese soils and 5 from Australia will be used as standard samples to assist staff at the Institute of Forensic Science Ministry of Public Security People's Public of China (Figures 3 and 4).

Dr KorneliaNehse, State Criminal Police Office, Berlin (kornelia.nehse@polizei.berlin.de) presented a series of lectures on fibres. Professor Gabriel J. Bowen, Geology & Geophysics Department, University of Utah in Salt Lake City, USA (gabe.bowen@utah.edu) presented a series of lectures on the use of isotopes in forensic science and hydrology. Thirty participants from a range of institutions across China attended the workshop lectures in Beijing from 26 to 27th September 2017.



Fig. 3. (Left) Prof Rob Fitzpatrick, CAFSS having discussions with Dr Guo Hongling, Vice Division Chief, Institute of Forensic Science Ministry of Public Security People's Public of China. (Right) Prof Rob Fitzpatrick presenting lecture with Dr Guo Hongling translating to Chinese.



Fig. 4. (Left) Dr Guo Hongling, Prof Rob Fitzpatrick, Dr KorneliaNehse, Dr Hu Lan, Professor Gabriel J. Bowen, Prof Chen Song and Dr Gao Yanmei. (Right) IUGS-IFG and Institute of Forensic Science Ministry of Public Security People's Public of China.

The Institute of Forensic Science, Ministry of Public Security, People's Public of China has started a series of research projects to promote forensic geology in china. In August 2017, the institute has successfully applied a project from the results of this work. The Ministry of Science and Technology of China also started to promote forensic geology with the assistance of grant. This is undertaken with collaboration from Institute of Soil Science, Chinese Academy of Sciences, Institute of Botany, Chinese Academy of Sciences, Northeast Normal University and Beijing Institute of Genomics. In addition, soil, plant debris, minerals, pollen and spores and special pollutants in soil evidence will be examined to provide information for soil sourcing purpose. A second grant was awarded to set up a soil databases for forensic applications with the help from the Institute of Soil Science, Chinese Academy of Sciences and China Geological Survey.

Prof Rob Fitzpatrick was trainer for the three day "Soil Forensics Workshop", which was part of the Trace Evidence Working Group (TEWG) of the Asia Forensic Sciences Network (AFSN) annual meeting and symposium held in Singapore from 5 to 10th September 2017 (9th AFSN). Rob presented a series of eleven one hour lectures on "Forensic Examination and Interpretation of Soil Evidence". The title of each lecture and a brief summary of the objectives of each lecture is outlined in the attached document. Fifty seven participants attended the workshop lectures from Singapore (45), Thailand (3), South Korea (3), Philippines (2) China (2) and Brunei (2) (Figure 5).



Fig. 5. (Left) Participants of the three day "Soil Forensics Workshop" in Singapore. (Right) Participants being shown how to describe a typical human-made soil during the one day "hands-on" Forensics Workshop in Singapore.

Rob also gave a one day "hands-on" workshop at the Health Sciences Authority (HSA) Forensic Chemistry and Physics Laboratory, in Singapore on 10th September, 2017. The "hands-on" workshop involved showing participants how to describe a soil in the field using a freshly dug soil pit in the garden at the HSA. The soil pit comprised a typical "human-made soil" or anthroposol with mixed layers of red soil that included abundant concrete fragments, which is the most dominant soil type in densely populated Singapore. This human-made soil profile was used to illustrate how to demarcate soil horizons and how to characterise soil features such as soil colour (e.g. using a Soil Munsell colour book), soil texture, soil structure, soil consistency and mottle patterns, which indicates the presence or absence of fluctuating or permanent water tables in soils from observations of "Redoximorphic Features" via Redox Concentrations and Redox Depletions (i.e. Iron and clay depletions; Reduced Matrix).

In the HSA laboratory, participants were shown how to conduct pH measurements in water and after peroxide treatment on a range of acid sulfate soils sampled in the SungeiBuluh Mangrove Wetland Reserve by Rob Fitzpatrick and staff from HSA on Friday 9th September. Acid Sulfate Soils are likely to be the most dominant "natural soils" (> 25%) covering the island of Singapore with "human-made soils" or anthroposols being the most dominant soil type. The laboratory tests conducted by participants confirmed the presence of acid sulfate soils with: (i) mostly pH of 5.5 – likely caused by the abandoned shrimp ponds, (ii) soil textures ranging from sands to light clays, (iii) pH peroxide = pH 1.5 to 3.5 and (iv) with high amounts of iron sulfide minerals (i.e. comprising hypersulfidic and monosulfidic materials). The forensic laboratory staff in Singapore will continue to conduct pH incubation tests on these samples in plastic chip trays for three months and will also dry soil sub-samples at 80 degrees centigrade to conduct metal release experiments and X-ray diffraction analyses. This set of samples will form part of a "future soil forensic archive of samples in Singapore". A joint CAFSS and HSA soil forensic technical report on the nature and occurrence of Acid Sulfate Soils and "human made soils" in Singapore is being planned for the future (Figure 6).



Fig. 6. (Left) Participants assisting Rob Fitzpatrick to sample Acid Sulfate Soils in Acid Sulfate Soils in the SungeiBuloh Mangrove Wetland Reserve on Friday 9th September. (Right) Participants conducting pH measurements in water and after peroxide treatment on a range of acid sulfate soils sampled in the SungeiBuloh Mangrove Wetland Reserve.

APPENDIX III: FORENSIC GEOLOGY IN ARGENTINA

3rd IberoAmerican Seminar on Forensic Geoscience, La Plata, Argentina 30 November to 1 December 2017

This event was a natural extension and continuation of the training and knowledge exchange events that IUGS-IFG, and committee members, has delivered previously in Brazil (2013, 2016), Colombia (2009), Mexico (2010) and Uruguay (2010).

IUGS-IFG Committee attendees at the 3rd Ibero- American Seminar on Forensic Geoscience (30 November to 1 December 2017) comprised Lorna Dawson, Shari Forbes, Carlos Molina Gallego, Fabio Salvador, Bill Schneck, Rosa Maria Di Maggio and Jennifer McKinley. The two day seminar was attended by more than 200 delegates including police, forensic geoscientists, academia and students, with more than 10 countries represented. The audience was extremely engaged and very interested in the work of IFG with several delegates expressing an interest in joining GIN. The seminar was opened and introduced by representatives from Conicet, IUGS_IFG, Policía Federal and Universidad Antonio Nariño. Rosa Maria Di Maggio gave a presentation outlining IFG activities and objectives from its establishment till present and introduced the committee members attending the seminar and their roles within IFG.

Discipline topics covered in the seminar were varied and wide ranging including forensic palynology, gemstone chemistry for transnational trafficking, forensic trace evidence and mineralogy, GIS and remote sensing in forensic geoscience and forensic archaeology, geophysics, environmental geoscience, taphonomy and forensic science, forensic entomology, stable isotopes as a tool in forensic investigations, forensic genetics and court report writing and presentation.

This was an extremely successful event which highlighted the need and desire to develop further IUGS-IFG collaboration in Latin America. The key outcomes and opportunities for future collaboration are:

- Interest in joining GIN from countries of Latin America not yet involved.
- Collaboration between IFG and Latin America Institutions (Federal Police, Academia, Forensic Science Institutes), especially for activities devoted to search for burials (Universidad Nacional de Río Cuarto, Argentina and Universidad Antonio Nariño Bogota, Colombia).
- Interest and commitment to host a 4th Ibero-American seminar and training workshop in Mexico in 2019 to encompass the wide range of forensic expertise in Latin America which are aligned with forensic geoscience.

The following summary and suggestions for future plans presented by Carlos Molina Gallego and Fabio Salvador highlight the commitment to strengthen collaboration with the IUGS-IFG:

Following the excellent results of the III IberoAmerican Seminar of Forensic Geosciences in Argentina, the importance and potential of forensic geosciences in Latin America became even more evident. The integration and interest of the researchers from Argentina and other countries present at this event, with the themes presented by the IFG team, reinforce the opportunity to broaden the application of forensic geology in Latin America. Each talk presented at the IberoAmerican Seminar created considerable interest from the public, researchers, and practitioners.

There was intimated greater interest, within this output, that it was suggested that there would be a great opportunity for the next scientific meeting to be based in Mexico and to be a congress on forensic geosciences. The organizational committee of the IV Seminar in Mexico in 2019 should, however, consider the scope and impact that may have the extension of topics beyond geosciences.

Subjects such as anthropology, mycology, palynology, and stable isotopes are also of relevance to search and are aligned to forensic geology. On the other hand the organizational committee should take into account the objectives defined by IUGS-IFG and the necessary limitations to avoid the overlap of topics with other areas of forensic knowledge already well developed.

It is suggested, for the interest of the colleagues of the IFG, that the meeting will have an additional day of field training. This is proposed to be mainly in forensic geophysics, micro-evidence and gemology. The availability of adequate spaces and logistical support by the institution that will host the training will be fundamental and essential to the success of this proposed meeting. Individuals elected as focal points for organization, fundraising, dissemination and control should be in close and constant contact, following IFG's definition of the whole context associated with the initiative. The announcement of the event should be initiated in advance, seek a wider audience and be made available from the new IFG website.



Fig. 1. Selection of photographs showing the IUGS-IFG team communicating with the audience in Argentina.

For further information

<http://www.forensicgeologyinternational.org> or <http://www.forensicgeologyinternational.org>



Contact Details

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	Training & Publications Dr Alastair Ruffell Department of Geography Queens University Belfast University Road Belfast BT7 1NN Tel: +44 (0) 28 9024 5133 E: a.ruffell@qub.ac.uk	Communications Dr Jennifer McKinley Department of Geography Queens University Belfast University Road Belfast BT7 1NN T: +44 (0) 28 9024 5133 E: j.mckinley@qub.ac.uk	