FIRMS CONFERENCE 2025

The 9th conference of the
Forensic Isotope Ratio Mass Spectrometry
Network

15-18 September 2025
London, UK

FIRMS

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Foreward

A welcome from the Chair

Welcome to the 9th Forensic Isotope Ratio Mass Spectrometry Conference! We are very pleased to be able to host the first in-person FIRMS Conference since 2019 at the Royal Society of Chemistry in London – the first time the Conference has returned to the UK in twenty years.

The FIRMS Conferences bring together scientists performing isotopic analyses in forensic contexts for research and for application to casework. If past conferences are anything to go by, then this promises to be full of technical innovations in forensic applications of isotope ratio mass spectrometry, results from analysis of new and challenging matrices, isoscapes and more.

Sincerely,

Thank you to our Sponsors

Without our Sponsors this conference would not be possible. We would like to thank our Sponsors for their generous contributions to the FIRMS Network.

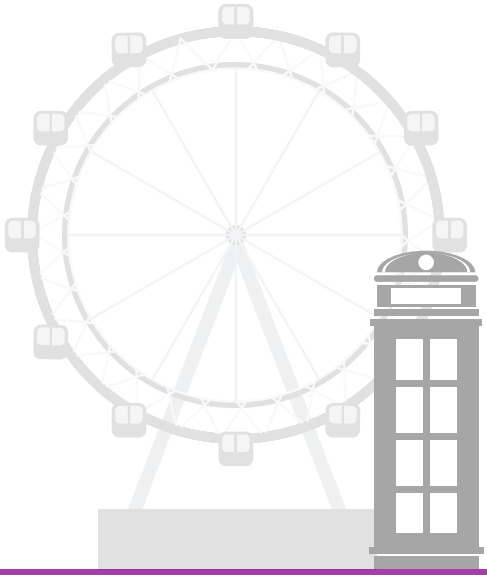
Welcome to London

London is home to cutting-edge industry clusters, world-renowned galleries, museums and Michelin-starred restaurants. The capital is leading the way in innovative event concepts with access to top speakers.

Being the global tech hub and financial capital, London offers great expertise for a range of sectors. With world-class talent alongside outstanding creative event and media agencies, the city is prepared for every focus you set for your event.

No other city on the planet matches London for its wealth of culture and rich heritage. With 233 different languages spoken and a great variety of cuisine, music and entertainment, London's diversity provides a friendly welcome to your delegates.

With six international airports and direct flights to 400 destinations, London is one of the best-connected cities worldwide. It is an easy city for your delegates to reach and an easy place to navigate once they're here. Read our guide to business travel in London.



Things to do and see

London offers incentive winners the best of all worlds. The capital is a diverse, modern and green city with gleaming skyscrapers boasting views over London's bustling streets. The city is steeped in culture and history, from royal palaces to world-renowned street art and cuisine as diverse as its residents. Take inspiration from these examples of themes for incentive activities:

1. Experience London from a different angle from the River Thames.
2. Learn more about the Royal Family and its history with Historic Royal Palaces including the Tower of London or Hampton Court Palace.
3. Eat your way through Borough Market or experience an afternoon tea at Fortnum & Mason. Tea is an integral part of English culture and should not be missed!
4. London museums are among the best in the world, and include Natural History Museum, Museum of London, and dozens more institutions.

London city centre

The London city centre street map includes information on attractions, walks and sightseeing, shopping tops, interactive map, top 10 sights and free museums

Download the Visit London app

Click here for ideas and inspiration for your visit

Transport in London

Getting to London

London Heathrow Airport
Heathrow is easily accessible by Tube, train (via the Heathrow Express with direct link to Paddington station), or by taxi. The newly opened Elizabeth line provides direct access to central London in about 30 minutes. It is operated by Transport for London and part of the Oyster card and contactless ticketing system.

Gatwick Airport
The Gatwick Express is a direct train service linking the airport to the centrally located Victoria station in 30 minutes. Thameslink and Southern rail operators also offer train services from Gatwick to several central London stations within 30 minutes.

London Luton Airport
Luton Airport Parkway train station is located 10 minutes from the airport by shuttle bus, and trains to central London take between 20 and 40 minutes depending on the train operator.

London Stansted Airport
The quickest way into central London is via the Stansted Express with trains to London Liverpool Street station taking 50 minutes.

London City Airport
It is the closest airport to central London, with easy access via the DLR network

Eurostar
High-speed train service to London is just a little more than two hours from Paris or Brussels or four hours from Amsterdam.

Public Transport

London is known to have one of the largest, safest and most efficient public transport networks in the world. It has integrated bus, rail, river and road systems spanning the city's 32 boroughs, and beyond.
For information on public transport and to plan your journey visit the Transport for London Website or the city mappers app.

The venue

In the heart of London's Piccadilly, the Royal Society of Chemistry at Burlington House is a prestigious event venue full of discovery, offering stories around every corner.

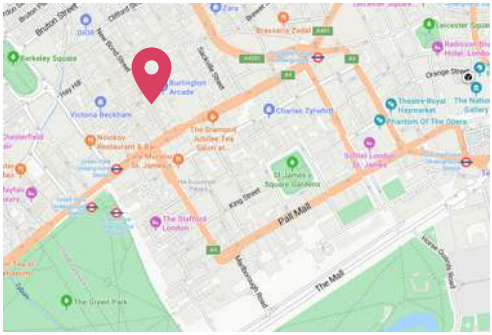
Burlington House was built in 1664 as a private mansion. Home of Richard Boyle, the first Earl of Burlington and second Earl of Cork, Lord Treasurer of Ireland, who gave the building its present name.

After different private owners, in 1854 the government decided to purchase Burlington House for £140,000 and eventually allocated it to the use of the learned societies.

This is still true today and, together with the Royal Society of Chemistry, Burlington House hosts seven other societies of comparable age and standing: the Royal Academy of Arts, the Linnaean Society, Geological Society, Royal Astronomical Society, the Society of Antiquaries, the British Astronomical Association and the Geological Association.

The venue combines rich heritage with vibrant spirit and contemporary facilities providing the perfect formula for an unforgettable occasion.

Burlington House,
Piccadilly,
London,
W1J 0BD



Useful information

Visas

EU, Switzerland, Norway, Iceland and Liechtenstein citizens can travel to the UK for short trips (up to six months) without needing a visa. You must travel using a passport which is valid for the duration of your stay to enter the UK. National ID cards are no longer accepted as travel documents (apart from in the case of some limited exceptions outlined by the UK government). Other visitors should check if they require a visa and apply online via the official UK government website. It can take several weeks to process visa applications.

Electronic Travel Authorisation (ETA) scheme

From the end of 2024, the UK government is set to introduce an Electronic Travel Authorisations (ETA) scheme for visitors and passengers transiting through the UK, who do not currently need a visa for short stays or have an immigration status prior to travelling.

Check all the latest information about visas and immigration on the official UK government website ahead of your event.

Programme

Monday 15 September
workshop

From Sampling to Interpretation: Quality Concerns in Isotope Ratio Mass Spectrometry

This interactive full-day workshop will walk participants through the complete analytical pathway for generating forensic isotopic evidence, using the FIRMS Network's guidance documents as a common thread. The workshop will begin with a primer on laboratory quality systems and the ISO/IEC 17025 framework then move into mini-sessions led by subject-matter experts on:

- Sampling Strategies
- Method Validation & Accreditation
- Data Handling & Uncertainty
- Interpretation & Database Building

09:00 - 10:00	Arrival and registration
10:00 - 13:00	Workshop 1
13:00 - 14:00	Lunch
14:00 - 17:00	Workshop 2

Tuesday 16 September

Morning session, Chaired by Sean Doyle

09:00 - 09:30	Arrival, registration and poster installation
09:30 - 10:00	Welcome to the FIRMS Conference 2025- NML and FIRMS
10:00 - 11:00	Keynote presentation: Forensic science at the crossroads – Which way will we go? - Niamh Nic Daeid
11:00 - 11:30	**Break**
11:30 - 11:50	Determining the nature of exposure in athlete doping violations using isotopes - John D. Howa
11:50 - 12:10	Evaluation of the endogenous or exogenous origin of testosterone in children by carbon isotope analysis: Report of two cases by the Drug Control Centre - Fabio Azamor de Oliveira
12:10 - 12:30	Identification of synthetic urine by analysis of natural carbon and nitrogen isotope ratios - Frank Hülsemann
12:30 - 12:50	Advancing isotope ratio measurements of trace metals and metalloids in the environment: Results of MetroPOEM project in the context of environmental forensics - Dmitriy Malinovskiy
12:50 - 13:00	Questions
13:00 - 14:00	**Lunch**

Tuesday 16 September

Afternoon session, Chaired by Jim Carter

14:00 - 14:20	Exploring the potential of amino acid δ^2H analysis as a forensic tool to identify region-of-origin - Emma A. Elliott Smith
14:20 - 14:40	A comparative study of isotope ratios in human bones and hair from a known contemporary skeletal collection - Tiffany B. Fracchia
14:40 - 15:00	Isotopic signatures of insects from decomposing carcasses - Fernanda G. Augusto
15:00 - 15:20	Intracortical radiocarbon ($F^{14}C$) and stable isotope variation in human femora - Karolina Cameron-Werens
15:20 - 15:50	**Break**
15:50 - 16:50	Sponsor presentations • Optimized static headspace sampling method for carbon isotope analysis of methanol and ethanol in water matrix - Mario Tuthorn (Thermo Fisher Scientific) • The next generation LC-IRMS for honey authenticity investigation - Niel Williams (Thermo Fisher Scientific) • Evaluation of high temperature LC-IRMS for detecting fraudulent addition of sugar to orange juice - Mike Seed (Elementar)
16:50 - 17:00	Questions
17:00 - 19:00	**Welcome drinks & poster session**

Wednesday 17 September

Morning session, Chaired by Phil Dunn

09:00 - 10:00	Arrival, coffee/tea
10:00 - 10:20	A stable foundation for the use of tooth enamel oxygen isotopes in human identification - Gabriel J. Bowen
10:20 - 10:40	Improving inter-laboratory comparability of tooth enamel carbonate stable isotope analysis ($\delta^{13}O$, $\delta^{18}O$) - Chris Stantis
10:40 - 11:00	Intra-individual and within-tooth isotopic variability: Implications for forensic identification - Kirsten Verostick
11:00 - 11:20	Accounting for human mobility in bulk enamel isotope analysis - Thomas A. Delgado
11:20 - 11:50	**Break**
11:50 - 12:10	How to validate a tooth enamel carbonate carbon & oxygen isotope analysis method: A tale of unexpected challenges and important lessons learned - Daniel L. Johnson
12:10 - 12:30	Using non-exchangeable hydrogen isotope analysis to trace wildlife origins across aquatic and terrestrial boundaries - David Soto
12:30 - 12:50	Advancing wildlife forensics: Multi-isotopic evidence to combat animal trafficking in Brazil - Fábio José Viana Costa
12:50 - 13:00	Questions
13:00 - 14:00	**Lunch**

Wednesday 17 September

Afternoon session, Chaired by Ethan Strak

14:00 - 14:20	Potential for identification of the source of an explosive material based on analyses of the stable isotope ratios of residues - James R. Ehleringer
14:20 - 14:40	Using isotopic analysis to determine the origins of synthetic potassium chlorates used in explosives - Denise Peacock
14:40 - 15:00	Isotopic characterisation of the homemade explosive (HME) R-salt - James F. Carter
15:00 - 15:20	IRMS analysis of polymeric material for comparison casework - Joe Meikle
15:20 - 15:50	**Break**
15:50 - 16:10	Establishing baseline stable isotope data for humanitarian forensic tracing in Tanzania - Maximilian Jan Spies
16:10 - 16:30	Disentangling dietary habit, sex differences, and tissue signature in human hair and nails via $\delta^{13}C$ analysis of bulk and individual amino acids - Gunjan Agrawal
16:30 - 16:50	Assessing C and H isotopic fractionation of aliphatic hydrocarbons during microbial degradation: Microcosm studies and environmental implications - Syahidah Akmal Muhammad
16:50 - 17:00	Questions
18:45 - 23:00	**Dinner cruise- West End on the Thames; boat departs from Westminster Pier**

Thursday 18 September

Morning session- Chaired by Joe Meikle

09:00 - 10:00	Arrival, coffee/tea
10:00 - 10:20	Implementation of the stable isotope analysis laboratory at the National Institute of Criminalistics of the Brazilian Federal Police: First investigations aided using the technology - J.M. Freitas
10:20 - 10:40	Isotopic fingerprinting of illegal timber: A provenance tool for the Amazon Basin - Luiz A Martinelli
10:40 - 11:00	Forensic determination of tropical timber provenance using strontium isotopes and multi-element signatures: Development and validation of a geochemical fingerprinting protocol - Camilla Kafino
11:00 - 11:20	World Forest ID: Large scale stable isotope ratio modeling for product verification - Victor Deklerck
11:20 - 11:50	**Break**
11:50 - 12:10	Applications of stable isotope ratio analysis and site-specific natural isotope fractionation-nuclear magnetic resonance in discriminating between synthetic and natural analogs - Matteo Perini
12:10 - 12:30	Stable isotope analysis of *Paubrasilia echinata* violin bows: Insights into the illegal exploration of an endangered tree species - Tais Ribeiro Muniz
12:30 - 12:50	Stable isotope fingerprinting of tomato processing: A forensic approach to food authenticity and traceability - Oana Romina Botoran
12:50 - 13:00	Questions
13:00 - 14:00	**Lunch**

Thursday 18 September

Afternoon session, Chaired by Jim Carter

14:00 - 14:20	Evaluation of measurement uncertainty during inter-laboratory characterisation of isotope delta reference materials and lessons for routine analyses - Philip Dunn
14:20 - 14:40	Guidance for stable isotope databases - Ethan Strak
14:40 - 15:00	Prizes - James F. Carter
15:00 - 15:20	**Closing remarks** - Philip Dunn
15:20 - 15:50	**Departure**

Keynote presentation

"Forensic science at the crossroads – which way will we go?"

Professor Niamh Nic Daeid

BSc BA PhD FRSE, FRSC, CChem, FCSFS, FICI, FFireInv,

Professor of Forensic Science
Director, Leverhulme Research Centre for Forensic Science
University of Dundee.

Niamh Nic Daeid is a Professor of Forensic Science and Director of the Leverhulme Research Centre for Forensic Science at the University of Dundee. She has been involved in forensic science education, research and casework for over 30 years. She is a Fellow of the Royal Society of Edinburgh and holds fellowships of the Royal Society of Chemistry, the Chartered Society of Forensic Science, the Institute of Chemistry of Ireland, the Royal Statistical Society and the UK Association of Fire Investigators. She is a registered forensic practitioner with the National Crime Agency and is authorised as a Forensic Chemist under the Criminal Procedure (Scotland) Act 1995.

Niamh holds national and international roles with the Home Office, the Scottish Biometrics Commissioner, the European Network of Forensic Science Institutes, INTERPOL, the International Criminal Court, and the United Nations. She sits on the steering committee of the Judicial primers which produce science primers for Judges led by the Lord Chief Justice of England and Wales in collaboration with the Royal Society and Royal Society of Edinburgh. She was previously on the FIRMS steering committee for a number of years.

Niamh has received many awards for her work including the Royal Society of Edinburgh Senior Medal for Public Engagement and the Stephen Fry Award for public engagement.

Social events

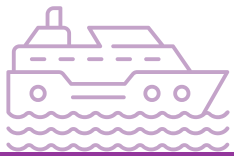
Poster session and welcome drinks

Date: Tuesday 16 September

Venue: Burlington House
Time: 17:00-19:00

Join us for an evening of posters and drinks to complete the first official day of the conference.

The reception with take place in the Council Room opposite the Library in Burlington House and will follow Session 2 of the day.



Thames dinner cruise

Date: Wednesday 17 September

Time: 18:45-23:00

Experience a unique way to explore London's landmarks from the Thames river aboard our river cruise.

What's included:

- Reception drinks
- BBQ dinner
- Music and bar
- London by night
- Networking

This event is included in the conference registration cost.

Please note, guests are advised to wear low-heeled suitable footwear. By attending the social event you are giving consent to photography and video being taken.

About the FIRMS Network

The Forensic Isotope Ratio Mass Spectrometry (FIRMS) Network was founded to develop the scope of stable isotope techniques in forensic applications.

The FIRMS purpose is to raise awareness of the relevance and importance of IRMS in forensic science, crime detection and reduction.

FIRMS brings together chemists, physicists, materials scientists and life scientists who employ IRMS in their respective fields. FIRMS is helping to focus collective knowledge and expertise on improving methods for crime detection and reduction.

As FIRMS continues to develop, it is imperative that we are kept fully apprised with the state-of-the-art from around the world.

If you are new to FIRMS, or if you are carrying out IRMS research that you would like to be advertised to the FIRMS network, please email: firms@forensic-isotopes.org

The FIRMS Network is certified to the international quality standard ISO9001 for the approval of forensic practitioners in the field of isotope forensics.

National Measurement Laboratory (NML) hosted at LGC

The NML is the UK's Designated Institute for chemical and biological measurement and supports the work of the Government Chemist. The NML predominantly delivers measurement research, enabling the NML to offer reference methods and materials, calibration facilities and services as well as specialised advice and training.

The NML plays a leading role in standardising measurements across the world helping to foster innovation, promoting productivity and economic growth.

The NML provides a unique function to the UK, working in partnership with its stakeholders to provide the expertise and knowledge to improve chemical and biological measurements across life sciences, green industries, and food sectors, resulting in reliable, trusted and proven answers to the most complex scientific issues.

The NML's measurement research supports health, food, environmental sustainability and security and underpins some of the biggest challenges of our time.

To find out more visit-
https://www.uknml.com

https://forensic-isotopes.org/index-secure.html