

THE BRITISH MASS SPECTROMETRY SOCIETY

IMSF International Workshop in Forensic Mass Spectrometry MAY 2021 ★ Sheffield UK

**Sheffield
Hallam
University**

BMS

IMSF WORKSHOP BID PROPOSAL 2021

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CRIME SCENE - DO NOT CROSS

FRONT COVER ILLUSTRATION:

Stainless steel roofscape of Sheffield Hallam Students Union, a tribute to the city's industry.



IMSF WORKSHOP BID PROPOSAL 2021

The British Mass Spectrometry Society (BMSS) in collaboration with Sheffield Hallam University (SHU) and the South Yorkshire Police & Crime Commissioner invite the International Mass Spectrometry Foundation (IMSF) and its affiliated societies to award the privilege of hosting an International Workshop in Forensic Mass Spectrometry to the Society and the City of Sheffield in 2021.



Simona Francese

Professor Simona Francese
IMSF 2021 Workshop Chair



J. Mosely

Dr Jackie Mosely
BMSS Chair Designate



M. McDowall

Dr Mark McDowall, JP
BMSS Meetings Secretary

The Worlds First Mass Spectrometry Society!



EXECUTIVE SUMMARY

FORENSIC MASS SPECTROMETRY

Mass spectrometry is growing rapidly in the field of forensic science and it is mass spectrometrists that are delivering results that directly and indirectly impact society. The significance of GC MS and LC MS/MS for qualitative and quantitative analyses in toxicology is well known, and the UK has particular strengths and expertise in this area (Cowan). More recently the UK has led the way in developing MALDI MS for fingerprint analysis (Francese), and direct analysis mass spectrometry is venturing beyond laboratories to deliver easy and fast analyses in the field. It is clear that for forensic science, MS-based analytical methods will continue to develop to meet new demands: new levels of sensitivity, increased robustness, new target compounds and new forensic applications.

As mass spectrometry is playing an ever greater role, it is important to stress that forensic science is multidisciplinary, requiring academia, industry and organisations such as law enforcers, governments, public health authorities, health services, social services and media to pull together. Finding a language that is accessible by all parties is paramount to this interdisciplinary research.

This workshop will bring together practitioners' at the cutting edge of forensic mass spectrometry research to provide technical training with key parties from non-scientific forensic arena who can present the wider context. This will establish a unique learning environment that goes beyond the "simple" instrumental analysis of evidence to explore the practice of a controlled vocabulary in an unprecedented building of a stronger and more connected forensic science community.

AIMS

The purpose of this workshop is:

- to provide an underpinning education in the fundamentals of the relevant technologies
- to introduce new technologies and deliver 'know-how' in advanced forensic mass spectrometry
- to explore analytical aspects crucial to forensic science including analytical validation, and robustness, data and data reporting, communicating beyond the scientific arena
- to engage and support early career researchers, advancing their skills, and enhancing awareness on the capabilities of mass spectrometry in forensic science
- to offer an overview of the big picture: where physical science works with social science and health science and non-scientific bodies
- to boost interdisciplinary networking and encourage international collaborations.

OBJECTIVES

To achieve our aims, we will bring together internationally recognised expertise to deliver a highly interactive workshop. We set the level of this workshop for delegates to have a degree level of scientific understanding and will encourage delegates to participate in poster sessions, practical sessions, discussion groups and a site visit to the forensic science facility of West Yorkshire Police.



THE PROPOSER

THE BRITISH MASS SPECTROMETRY SOCIETY (1964)

The British Mass Spectrometry Society (BMSS) proposes to organise and host an IMSF International Workshop in Forensic Mass Spectrometry in 2021.

The BMSS is a registered charity (registration number 281330), with the society's origins dating back to 1964, and whose purpose is to promote and disseminate knowledge of Mass Spectrometry and allied subjects for the benefit of the public. We achieve this by regularly organising conferences and training courses.

We have just celebrated our 40th Annual Conference, held over 3 days and preceded by our 2-day Introduction to Mass Spectrometry Course. The Society's training courses have been a regular feature on the British MS landscape since 1993.

The UK hosted the first IMSC meeting in 1958 and subsequent meetings in 1961, 1985 and 2003 and at the 2003 meeting the BMSS introduced its Careers Workshop which has featured at every IMSC meeting since.

Education is the highest priority of the British Mass Spectrometry Society !

EQUALITY, DIVERSITY & INCLUSION

The British Mass Spectrometry Society (BMSS) is committed to ensuring equality, diversity and inclusion for its members, employees, scientific partners, meetings delegates and the Society's service providers. More information can be found on the EDI pages of the BMSS website: <https://www.bmss.org.uk>



Harry Brearley of the Brown-Firth research laboratory in Sheffield discovered a 'rustless' steel alloy in 1913. Over the following 100 years Stainless Steel cutlery and other mass produced steel goods became synonymous with Sheffield.

IMSF WORKSHOP ORGANISING COMMITTEE

Professor Simona Francese, (SHU & IMSF 2021 Workshop Chair) is well known for the development of MALDI imaging for the analysis of latent fingerprints and has hosted the 2019 International Fingerprint Research Group Meeting Biennial Conference (SHU). She works closely with The Home Office Centre for Applied Science, The Ministry of Defence, West Yorkshire Police, Israel Police, US forensic providers and the Netherlands Forensic Institute - developing protocols for “chemical criminal profiling”. This technology has been implemented in police casework in the UK and Europe.

Dr Jackie Mosely, (Teesside University and BMSS Chair designate) has been involved in delivering the BMSS’s training courses since 2005 and delivering the BMSS Careers Workshop at IMSC in 2016 and 2018. Her research with controlled substances in public settings involves working with public health authorities, the police, festival organisers, and a charitable harm reduction service.

Dr Mark McDowall JP, (BMSS Meetings Secretary) is responsible for organising the society’s 3-day Annual Meetings *e.g.* Manchester (2017), Cambridge (2018), Manchester (2019). Dr McDowall was also a member of the organising committees for the 16th IMSC (2003), the ProteoMMX series of meetings (2010 - 2016) and HTC-15 (2018).

Professor David Cowan, (KCL, London) is the former head of the Forensic Science and Drug Monitoring Department at King's College London. He directed the WADA accredited laboratory at KCL including the testing for the London Olympic and Paralympic Games in 2012. He is currently Professor Emeritus in Pharmaceutical Toxicology at King's College London.

Dr Melanie Bailey, (University of Surrey) is Chief Analyst for the Surrey Ion Beam Centre and has worked closely with The Home Office Centre for Applied Science, Israel Police and the Netherlands Forensic Institute to develop protocols for SIMS analysis of fingerprints. She was an Expert Consultant for the IAEA, and works with several police departments.

Professor Martina Marchetti-Deschmann, (TU Wien. IMSF board member & IMSF Focus Groups coordinator) has been working in mass spectrometry for more than 20 years, is involved in national MS training courses and coordinates topic-related activities within the IMSF since 2016. Her research strongly focuses on soft ionization techniques and the visualization of analyte distributions relevant for medical, pharmaceutical or biotechnological applications and forensics.

Dr Bryan McCullough (National Measurement Laboratory, LGC) is the Science Leader for Innovation Mass Spectrometry at the NML, the UK’s designated institute for chemical and bio-measurement. He has a strong background in instrument development and the application of novel mass spectrometry techniques for a range of analyses. His recent research has involved the development of ambient ionisation mass spectrometry techniques and exploring their combination with miniaturised analysers with a particular focus on forensic applications such as bulk drug identification and trace explosive detection

Dr James Riches, (Defence Science and Technology Laboratory (DSTL) has involved chemical sensing, fire science and the analysis of chemical warfare agents including attribution science. More recently James has focused on chemical detection and monitoring projects in policing and security and is the Technical Manager for the UK’s type approval capability in breath alcohol and drug driving.



IMSF WORKSHOP STRUCTURE

OVERVIEW

We will bring together internationally recognised expertise to deliver a highly interactive workshop. We set the level of this workshop for delegates with a degree level of scientific understanding and will encourage delegates to participate in poster sessions, practical sessions, discussion groups and a site visit to the forensic science facility of West Yorkshire Police.

POSTER PROGRAMME

The poster programme is one of the key features of the workshop. Students must submit an abstract and prepare a poster for the workshop's poster session. Even participants who have not worked in Forensics Sciences so far, will be encouraged to bring a poster that highlights their research interests as a way to introduce themselves and perhaps find suitable collaborators for their work. The poster session is on the evening of the first day of the workshop, is displayed for the duration of the event in a location where all the catering will be provided. This will enable participants to mingle and network. The best poster, selected by the International Faculty (based on clarity, significance & presentation), will be awarded a prize of £500.

PRACTICAL PROGRAMME

The five practical sessions are a second key features of the workshop. Session 1: A site visit to West Yorkshire Police mass spectrometry imaging and enhancement laboratory featuring lectures by Senior Crime Scene Investigators. Session 2: Hands-on session focusing on in-field applications of mass spectrometry in the SHU laboratories. Session 3: Clinic session focusing on forensic challenges identified by the course delegates. Session 4: Presenting a new method for the first time in court. Session 5: Working with the media.

SCIENTIFIC FACULTY

Dr Vincenzo Abbate, KCL, London, UK
Dr Melanie Bailey, University of Surrey, UK
Dr Michael Buckley, Manchester University, UK
Professor Josie Bunch, NPL, Teddington, UK
Professor David Cowan, KCL, London, UK
Dr Phil Dunn, LGC, UK
Professor Ron Heeren, Maastricht University, NL
Dr Bob Flanagan, KCL, London, UK
Professor Simona Francese, SHU, Sheffield, UK
Professor Martina Marchetti-Deschmann,
TU Wien, Vienna, Austria
Dr Bryan McCullough, LGC, UK
Professor Ruth Morgan, UCL, London, UK
Dr Jackie Mosely, Teesside University, UK
Professor Tamsin O'Connell, Cambridge, UK
Dr James Riches, DSTL, UK
Dr Patrick Sears, University of Surrey, UK

INVITED FACULTY:

Mr Peter Arnold, Yorkshire and Humber Regional
Scientific Support Services, UK
Dr Alan Billings, South Yorkshire Police and Crimes
Commissioner, UK
Dr Max Houck, Forensic Studies and Justice,
University of South Florida, St. Petersburg, USA
Dr Glenn Langenburg, Elite Forensics, St. Paul,
Minnesota, USA

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IMSF WORKSHOP PROGRAMME

	MONDAY 17th May 2021	TUESDAY 18th May 2021	WEDNESDAY 19th May 2021	THURSDAY 20th May 2021	FRIDAY 21st May 2021
	Day 1 - The role of Forensic Science in investigations and judicial debates	Day 2 - Fundamentals of mass spectrometry techniques that are relevant to, and focused on forensic applications	Day 3 - From the Practitioners	Day 4 - From the Practitioners	Day 5 - Emerging MS technologies for forensic science
8.30	REGISTRATION AND POSTER SETUP WITH COFFEE	Lecture 10. Ionisation techniques used in forensic applications: ESI, DART, EI, ICP	Practical session 1. Visit to West Yorkshire Police HQ (Calder Park, Wakefield). To include tour of imaging and enhancement labs; lectures by Senior CSI.	Lecture 17. New methods in toxicology and for the world anti-doping agency	Lecture 23. Imaging and chemical analyses of surfaces
10.00	WELCOME and HOUSEKEEPING	Lecture 11. Mass analysers and good practice in forensic science applications		Lecture 18. Interpretation of toxicological evidence using MS	Lecture 24. MALDI applied to blood analysis and fingerprints
10.30	Lecture 1. Crime Prevention: initiatives, resources and outcomes				
11.00	Lecture 2. Forensic regulator - Grand Challenges for forensic science	COFFEE		COFFEE	COFFEE
11.30	Lecture 3. Grand Challenges of forensic science	Lecture 12. Good practice for IRMS		Practical session 4. Presenting a new methods for the first time in court	Lecture 25. Drug Analysis in hair by Imaging Mass Spectrometry
12:00	Lecture 4. Bias in forensic science	Lecture 13. Separation science in forensic applications: GC, LC and IMS			
12.30	Lecture 5. Evidence based interpretation - the activity level issue				

Societal related lectures
fundamentals
interactive
toxicology

chemical warfare and IRMS
emerging technology and applications for MS
Controlled drugs and precursor chemicals

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13.00	LUNCH	LUNCH	LUNCH	LUNCH	
13.30					Lecture 26. Forensic Mass Spectrometry of bones
14.00	Lecture 6. The roles of CSI in the search collection and transmission of the evidence in the 21st century	Lecture 14. Quantitative mass spectrometry and use of reference standards	Practical session 2. Mass spectrometry for in-field applications (<i>instruments available for hands-on work</i>)	Lecture 19. Ambient ionisation for explosives detection - challenges and opportunities	
14.30	Lecture 7. Expert Witness: role and challenges				Lecture 27. Investigation of human paleoecology using isotopes
15.00	Lecture 8. Work of a criminologist	Lecture 15. Qualitative mass spectrometry and the use high resolution accurate mass measurement, tandem MS and libraries		Lecture 20. Detection of chemical warfare exposure	
15.30	Lecture 9. Connecting end users and academia, challenges, benefits and successes		COFFEE		COFFEE
16.00	Welcome mixer, evening meal, poster session, networking	COFFEE	Practical session 3. Problem solving on a given forensic challenge	COFFEE	Practical session 5. Working with the media
16.30		Lecture 16. Surface analysis and imaging for forensic science: MALDI, ion beam, DESI, LESA		Lecture 21. Controlled Substances: cannabis & CBD products; emergence of New Psychoactive Substances	
17.00				Lecture 22. Managing evidence and chain of custody	Discussion/event close
17.30		Evening meal followed by careers workshop and career development opportunities in forensic science			
18.00			networking, free time	CONFERENCE DINNER with ECR prize giving	
18.30					
19.00					

IN PARTNERSHIP WITH WEST YORKSHIRE POLICE



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WELCOME TO THE CENTRE OF BRITAIN

SNOWDONIA NATIONAL PARK



CHATSWORTH HOUSE



PEAK DISTRICT
NATIONAL PARK

LAKE DISTRICT NATIONAL PARK



IMSF WORKSHOP BID PROPOSAL 2021

ACCESSIBLE CENTRE FOR FORENSIC MS

SHEFFIELD HALLAM UNIVERSITY

Sheffield Hallam University (SHU) is the optimum location for the IMSF Workshop in Forensic Mass Spectrometry. Located close to the geographic center of the UK it provides an internationally accessible and affordable venue.

The City of Sheffield offers comprehensive public transport including an extensive bus and tram network. The Sheffield Hallam University (SHU) City Campus is located adjacent to the city's main train station. Sheffield benefits from high-speed road and rail links to the rest of the UK and Europe.

Three major international airports, London Heathrow (LHR), Manchester (MAN) and Birmingham (BHX) are accessible by train. In addition Sheffield is served by three regional airports: Doncaster-Sheffield (DSA), Leeds-Bradford (LBA) and East Midlands (EMA).

TRAVEL ASSISTANCE

The BMSS Administrator will provide letters of invitation, on request, to IMSF Workshop delegates that require a visa to enter the UK. The BMSS Meetings Secretary will endeavour to provide international delegates with general advice on travel to and within the UK.

FORENSIC MASS SPECTROMETRY

SHU is the natural UK location for an IMSF Workshop in Forensic Mass Spectrometry - anchored by the research group of Professor Simona Francese (IMSF 2021 Workshop Chair).



The universities of the region and their associated institutes and hospitals form a network of MS excellence. Most of the major MS instrument companies have facilities in the region together with numerous independent MS service providers and technology innovators.



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SHEFFIELD HALLAM UNIVERSITY



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SHEFFIELD HALLAM UNIVERSITY

THE IMSF WORKSHOP VENUE

The SHU City Campus, just five minutes walk from Sheffield train station, offers convenient and modern conference facilities in the heart of the city.

The SHU Event Services team are well-established partners of the BMSS. The BMSS MALDI & Imaging Special Interest Group (Clench & Francese) has arranged very successful meetings annually, at this venue, since 2014.

Based on the strength of that relationship the Society has elected to hold its 41st BMSS Annual Meeting at the SHU City Campus in 2020. The BMSS and the SHU Event Services team have evolved a professional and productive working relationship over five plus years. Consequently the BMSS has no reservations whatsoever in proposing the SHU City Campus as the venue for the IMSF 2021 Workshop in Forensic Mass Spectrometry: <https://www.shu.ac.uk/business/event-services>



AFFORDABLE ACCOMMODATION

ACCOMMODATION:

Sheffield offers a wide range of hotels located close to the SHU City Campus.

The local organising committee will enter into a contractual arrangement with **SHU Event Services** to block book sufficient affordable hotel accommodations for all students and the International Faculty participating in the proposed IMSF workshop in 2021.

SHU Event Services offer preferential rates at a selected portfolio of the city's hotels from £56 ppn. All SHU Event Services portfolio hotels offer en-suite accommodation, include breakfast and some also feature leisure facilities. View the current (2019) SHU portfolio of hotels at: <https://www.shu.ac.uk/business/event-services>



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IMSF WORKSHOP FINANCIAL MANAGEMENT

BUDGETING & ACCOUNTING

The British Mass Spectrometry Society is a UK registered charity (No: 281330) and adheres to the good financial management practices expected of a UK charity.

The UK has one of the world's most stringent regulatory frameworks for charitable foundations. The BMSS employs **Howard Worth** (<https://www.howardworth.co.uk/>) a UK firm of chartered accountants to facilitate the society's continuous compliance since its foundation in 1964 with all prevailing UK/EU legislation.

The BMSS shall instruct its accountants (Howard Worth) to prepare audited accounts for the proposed IMSF workshop in Forensic Mass Spectrometry 2021.

RISK MANAGEMENT

The BMSS has developed a cordial working relationship with its event insurer (Hiscox Underwriting Ltd.) for the Society's significant endeavours including its 3-Day Annual Meeting (and integral educational training course) Ca 450 delegates.

The BMSS will enter into an insurance contract (Hiscox) to arbitrage the Society's risk incurred in hosting the IMSF Workshop in Forensic Mass Spectrometry 2021.

FINANCIAL LIABILITY

The BMSS will underwrite the whole financial risk for the proposed IMSF Workshop in Forensic Mass Spectrometry, Sheffield (2021).

REGISTRATION FEES

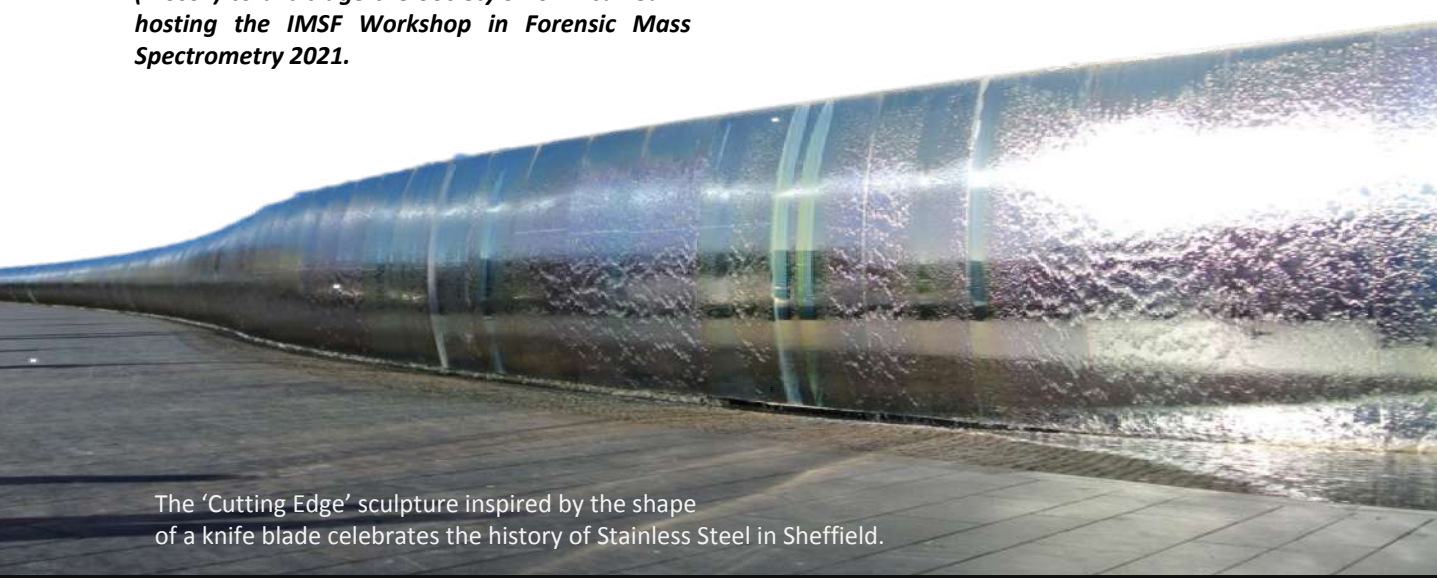
The BMSS intend to keep the delegate registration rates to a minimum. Students will be encouraged to join the BMSS. For a membership fee of £28.00 *bona fide* students will be eligible to apply for a **BMSS John Beynon Travel & Conference Fund** grant to support their attendance at this workshop: <https://www.bmss.org.uk/grants/>

VAT EXEMPT CERTIFICATION

The BMSS is a UK registered charity (No: 281330) and thus expects to obtain a UK VAT exemption certificate for the proposed IMSF workshop. Consequently student delegate's fees should not be subject to VAT.

SPONSORSHIP

At the time of submission, the South Yorkshire Police and Crime Commissioner has generously agreed to contribute significant support to the IMSF Workshop in Forensic MS.



The 'Cutting Edge' sculpture inspired by the shape of a knife blade celebrates the history of Stainless Steel in Sheffield.

IMSF WORKSHOP BUDGET

ITEM	EXPENDITURE	INCOME
Day Delegate Charges:		
1. 75 Delegates x 5 days x £45 <i>pppd</i>	£ 16,875	
2. 20x Faculty + 2x Staff x 5days x £45 <i>pppd</i>	£ 4,950	
Faculty & BMSS Staff Accommodation Charges:		
1. 20x Faculty + 2x Staff x 5 days x £100 <i>pppd</i>	£ 11,000	
Faculty & BMSS Staff Travel Allowance:		
1. UK 16x £200	£ 3,200	
2. European 2x £400	£ 800	
3. North American 2x £1,500	£ 3,000	
4. BMSS Staff (UK) 2x £ 50	£ 100	
Social Event:		
1. 75x Delegates + 20x Faculty + 2x Staff x £35	£ 3,395	
Conference Dinner:		
1. 75x Delegates + 20x Faculty + 2x Staff x £50	£ 4,850	
Coach Hire (Site Visit to Yorkshire Police Labs):		
1. 2x 50-Seat Coaches x £400	£ 800	
Poster Board Hire:		
1. 40x Double Sided x £20	£ 800	
Poster Prize:		
	£ 500	
Event Insurance:		
	£ 1,000	
Delegate Registration Fees:		
1. BMSS Student Member 55 x £499		£ 27,445
2. BMSS Ordinary Member 15 x £699		£ 10,485
3. BMSS Non-Member 5 x £ 899		£ 4,495
Sponsorship:		
1. Anticipated Total Sponsorship		£ 11,500
SUB TOTALS:	£ 51,270	£ 53,925
Contingency Provision (Ca 5%):	£ 2,500	
PROJECTED SURPLUS: £ 155		

The total cost per delegate, for implementing this IMSF workshop, calculated by dividing the total expenditure (including the contingency provision) by 75 delegates amounts to £717pp. Thus the BMSS Student Member registration fee of £499pp represents a significant return of value to the student body. All bona fide students, irrespective of nationality, may become members of the BMSS for an annual fee of £28. The delta (£400) between the BMSS Non-Member fee of £899 and the BMSS Student Member fee of £499 offers outstanding value to the student body.

IMSF WORKSHOP CONTACT DETAILS

BMSS CHAIR DESIGNATE:

Dr Jackie Mosely
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J.Mosely@tees.ac.uk

BMSS ADMINISTRATOR:

Mrs Lisa Sage:
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admin@BMSS.org.uk

BMSS MEETINGS SECRETARY:

Dr Mark McDowall JP
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REGISTERED OFFICE:

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