msis Society
The Home of Mass Spectrometry Imaging

March 2021

Vol 2 Issue 1

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Visit the updated MSIS website

You can now post job opportunities, check future events, and view past newsletters on our updated website

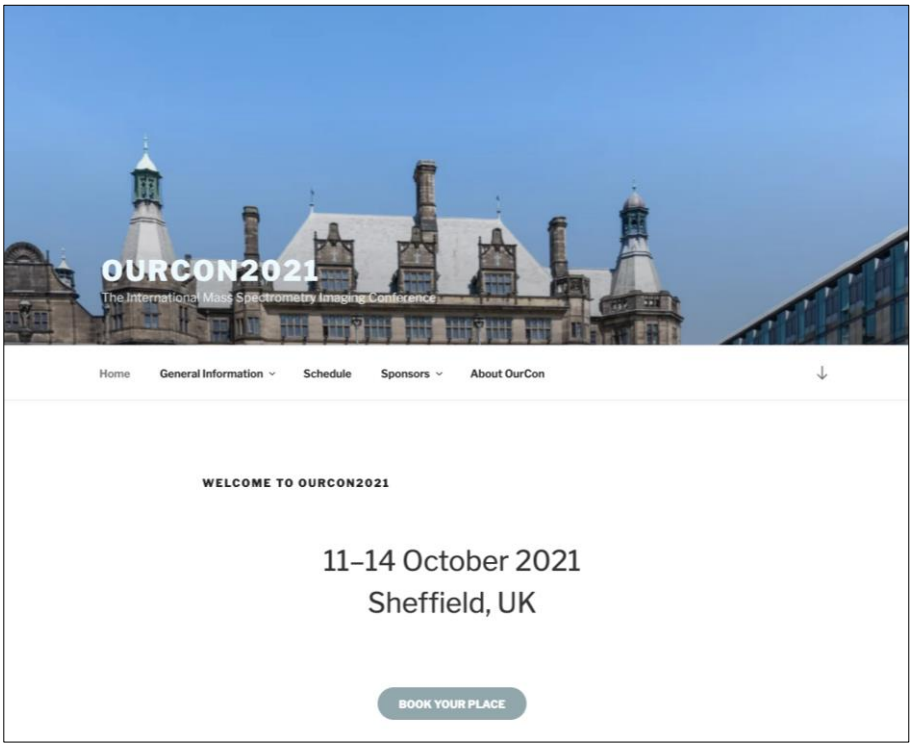
https://ms-imaging.org/wp/

OURCON2021

The International Mass Spectrometry Imaging Conference

The OurCon2021 website is now live! Find all the information you need and book your place for the upcoming OurCon2021 at Sheffield.

http://ourcon.org/2021/



DON'T MISS!

Registration and **abstract submission** are now open at:

http://ourcon.org/2021/abstract-submission/

and the launch of MSIS funded **travel grants** for PhD students and early career researchers**.**

Key dates:

- Oral presentations abstract deadline: 30th June
- Poster presentations abstract deadline: 31st July
- Travel grant applications closing date: 30th June

Become an **MSIS member** now for discounted registration prices in OurCon2021 and access to exclusive MSI material and events!

Travel grants

The MSIS executive board is happy to announce the sponsorship of 3 travel grants, worth **500 € to 3 eligible PhD students and 1 travel grant, worth 500 €, to an early career researcher**, to attend OurCon2021 at Sheffield.

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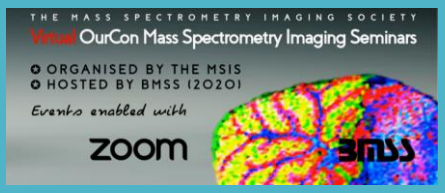
MSIS Calendar

MSIS VIRTUAL OURCON SEMINAR SERIES (HOSTED BY BMSS)



Online Event

For more information:
[MSIS virtual OurCon Seminar Series (Hosted by BMSS)]

OURCON 2021

11-14 Oct 2021

Sheffield, UK

For more information:
[ourcon.org/2021/]

IMSS 2021 MEETING

3 - 6 Oct 2021

Colorado Spring, CO

IMSS Imaging Mass Spectrometry Society

Mass Spectrometry Imaging Society:
Meet distinguished members of the MSI community

Alain Brunelle

Laboratory of Molecular and Structural Archaeology (CNRS and Sorbonne University, Paris)

Dr. Brunelle obtained his Ph.D. from the Paris-Sud University in Orsay, France, in 1990, under the supervision of Dr. Yvon Le Beyec. He is a Director of Research at the CNRS. Until 2002, his research was focused on the study of the interactions of energetic particles (ions, clusters, molecules, photons) with matter. He particularly studied secondary ion emission and sputtering under the impact of gold clusters having energies ranging from a few keV to several tens of MeV. Between 2002 and 2018 he developed a project of biological imaging mass spectrometry by cluster-TOF-SIMS and MALDI-TOF, at the Institute of Natural Substances Chemistry (CNRS), where he headed the mass spectrometry group. He was a partner of the European pioneering project COMPUTIS and a member of the COST action “Mass Spectrometry Imaging: New Tools for Healthcare Research”. He moved in 2019 to the Laboratory of Molecular and Structural Archaeology (CNRS and Sorbonne University, Paris) with a new project which aims to use TOF-SIMS imaging in the field of cultural heritage, in particular for the analysis of old painting samples.

How you came to be involved in MSI?

The first fourteen years of my scientific career, including my doctoral thesis, were spent studying desorption-ionization phenomena, particularly under the impact of polyatomic projectiles with a team of physicists led by Yvon Le Beyec. We were then amongst the first laboratories to discover the enormous potential of cluster ions for chemical surface analysis. In 2002, I joined the mass spectrometry team of the Institute of Chemistry of Natural Substances headed by Olivier Laprévote. This allowed me to transition from a fundamental to a more applied environment where physics principles could be applied to chemistry and biology. This is where I became interested in MSI. Indeed, our lab was amongst the first in France, around the same time as our colleague Isabelle Fournier, to embark on the MSI journey. Our goal was to develop new methods and original applications, mainly to detect and image small molecules in biological samples. We were particularly interested analyzing lipids by TOF-SIMS, then called a "lipid microscope", and later by MALDI-TOF MS, when many others were removing these intruders to better detect proteins. For the past two years, I have once again chosen to challenge myself with a new scientific orientation and environment. At the Laboratory of Molecular and Structural Archeology (CNRS and Sorbonne University, Paris), with chemists, restorers and art historians, I now focus on the analysis of cultural heritage objects.

What do you think MSIS brings to the MSI field? What else would you like to see from the society?

MSIS creates a network! It allows the whole community to meet and get to know each other better: young and seniors investigators, experts in method developments, instrument manufacturers, service companies or simple users of MSI technology.

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General Assembly 2020

New MSIS executive board member

Gregory Hamm (PhD) is Associate Principal Scientist at AstraZeneca from the Imaging & AI team in Clinical & Pharmaceutical Safety Sciences (CPSS).

Gregory elected in the position of Outreach representative of the MSIS members during the annual general assembly of the society that took place on Wednesday 16 Dec 2020.

MSIS Executive board elections

The Society has decided to postpone the board elections for another year due to COVID-19 pandemic and for the conclusion of the unification work with IMSS.

MSIS membership and activities

The society has decided to offer educational tutorials and activities exclusively to its members. Don't miss this opportunity and sign up for a membership now:

https://ms-imaging.org/wp/membership-account/membership-levels/

Have you participated in OurCon and if yes what are your best memories? (please share photos if you have)

I participated in four OurCon conferences: the inaugural one in Ourense in 2012, the second in Antalya in 2014, the fourth in Ustron in 2016, and finally the seventh edition in Saint-Malo in 2019. I have excellent memories from each of these conferences not only because of the excellent scientific programs, but also the discovery of wonderful local cultures. This type of specialized conference is very important because it brings together scientists from different thematic origins and scientific disciplines around a common idea. In addition to the size of the conference, its number of participants is perfect for generating new networks and for minimizing generation gaps. This is mainly what sets a conference like OurCon apart from larger, more generalist conferences.

An evening at OurCon-II in Atalya, 2014 with French speaking friends. From left to right: Pierre Chaurand, Martin Dufresne, Alain Brunelle, Mathieu Gaudin, Grégory Hamm

What drives your enthusiasm for the field of MS imaging?

I have always enjoyed working at the interface of fundamental research, instrumentation, and applications. These three aspects feed on each other and have always propel my research activities. MSI is one such technology which reunites fundamental aspects of desorption-ionization combined with method development for a wide range of applications. Further, MSI is an unsurpassed imaging method that provides precise chemical information perfectly correlated with the geometry of the sample analyzed for a wide range of (bio)molecules. This possibility is very exciting for multiple fields of research.

How do you think the field will be in 5-10 years from now?

The epicenter of MSI is today located in medical, clinical and pharmacology research mainly investigating animal or human tissue samples with a strong emphasis on the study of disease, and I expect this to continue. There are also incredible upcoming challenges for other fields of research such as plant biology and microbiology, to which I have contributed in the past. In the field of cultural heritage and in archeology, MSI is only in its infancy. From an instrument point of view, we see today the emergence of new generations of SIMS instruments equipped with analyzers (TOF/TOF or Orbitrap) allowing tandem mass spectrometry analysis and offering resolutions and precisions equivalent to what is already achievable for MALDI and DESI. In my opinion, this will undoubtably expend the use of SIMS imaging technology to the field of biology because of its unequaled spatial resolution, its reproducibility, and its ability to analyze organic and mineral compounds in one single experiment.

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A big thank you to ***Garry Corthals*** for his service as an Outreach representative for the MSIS

The MSIS Executive Committee would like to acknowledge the valuable contribution of former board member Prof. Garry Corthals, who recently gave up his role on the executive committee to allow newer members to join. Garry secured funding for some of the first European MSI training courses (funded through Nordic Signals), was the vice Chair of COST Action BM1104, and one of the co-organizers of the first OurCon conference. Garry's support and encouragement helped the society to emerge, and to establish important links with international bodies such as the HUPO-PSI (essential for the development of the imzML data format standard). Garry is no longer a member of the board but remains a valued member of the society and support of MSI.

What are the main challenges and the biggest success you have encountered in your career and what do you think can be improved in the field of MSI?

To become integrated into chemistry with a background in physics was, I think, my first main challenge, but repeating it today with art historians is no less difficult! The result is to have articles published in periodicals as scattered as *Nuclear Instruments in Methods in Physics Research, Physical Review Letters,* the *Journal of Lipid Research,* the *Journal of Cultural Heritage, Acta Neuropathologica,* and the *Journal of Natural Products*, with also three seminal articles on the use of bismuth clusters in TOF-SIMS imaging, published in 2004-2005 in *Analytical Chemistry*, the *Journal of Mass Spectrometry*, and the *Journal of the American Society for Mass Spectrometry.*
I am watching with interest the growing interest for multimodal imaging. Not only the combination of two or more MSI methods, but also the complementary between MSI and other modes of imaging.

What advice would you give to a student entering an MSc/PhD project?

Always stay curious and keen to learn, specifically looking beyond the boundaries of one's scientific background, without getting locked up in a comfort zone. As a mass spectrometrist, this includes being familiar with the operation and physics behind the mass spectrometer you are using. Ask yourself each evening what you have learned today and what you have passed on. And always remain humble in front of your results and colleagues.

Marta Sans Escofet

CPRIT TRIUMPH Postdoctoral Fellow at MD Anderson Cancer Center, Austin Texas

Dr. Sans Escofet is originally from Castellar Del Valles, a small town near Barcelona, Spain. In 2011, Marta moved to the US to pursue her Bachelor's Degree in Chemistry at the University of New Orleans while competing as a student athlete on a NCAA DI tennis scholarship. In college, Marta was exposed to various research opportunities, such as the Louisiana Biomedical Research Network REU Summer Program at Louisiana State University, and decided to o pursue a PhD in Analytical Chemistry once she graduated. In the Fall of 2015, she joined the laboratory of Professor Livia Schiavinato Eberlin, who was just starting her laboratory at the University at Austin with an impressive early career on her shoulders and very exciting ideas and projects in mind. In Dr. Eberlin's group, Marta was introduced to various mass spectrometry imaging techniques and rapidly became very interested in the field and its applications. During her graduate career, Marta lead and was involved in several research projects, including method development projects in ambient ionization and mass spectrometry imaging for cancer research and diagnostics, such as the MasSpec Pen, as well as focusing on applying such methods to investigate ovarian cancer towards improving the treatment and diagnosis of the disease. While getting her PhD, Marta received various awards, such as the Excellence in Research Award and the University Graduate Continuing Fellowship from UT Austin, and had the opportunity to attend various national and international conferences to meet the community and present her work. One of her favorite

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24hr IMSI and 2020 IMSI POSTER GALA

The highlights of the 2020 MSI events

In November 2020, ***the 24 hours of International Mass Spectrometry Imaging*** gathered scientists who shared their passion for MSI from all over the globe and for 24 hours non-stop. The event was a success with more than 600 registrants.

In addition to the 24hr IMSI event, last December IMSS and MSIS hosted together ***a virtual poster session*** with the help of sponsors, Bruker, HTX Imaging and N-zyme Scientifics. The poster session produced an exciting array of new technology, applications, and data strategies from around the globe, this time with a chance to chat with poster authors. Thank you to our poster committee, session chairs who worked hard to organize the event and the imaging community who attended the event!

Big thanks to ***Tiffany Porta Siegel (M4I, Maastricht, MSIS)*** and ***Peggi Angel (Charleston, IMSS)*** for the initiative and chairing the events.

graduate school experiences was participating in the SXSW MasSpec Pen showcase and attending the award ceremony with the MasSpec Pen team being awarded first place! Marta defended her PhD defense in February 2020, and driven by her passion for translational cancer research, started her postdoctoral career as a CPRIT TRIUMPH Postdoctoral fellow at the MD Anderson Cancer Center in March 2020, where she joined the laboratory of Professor Anirban Maitra, a leader in the field of pancreatic cancer research and pathology. Currently, Marta is exploring applications of mass spectrometry imaging to investigate the pancreatic cancer tumor microenvironment and therapeutically induced molecular changes in conjunction with innovative techniques in molecular pathology and genetics, which has already been an incredibly rich learning experience. Marta was recently awarded the Bertha Condron Award from the FeMS organization in honor of the many females in history whose stories inspire the success of future generations, and is excited to continue to contribute to the field of mass spectrometry imaging and its community and one day lead her own team and laboratory.

How you came to be involved in MSI?

I was introduced to mass spec imaging when meeting Livia (my PhD advisor) and joining her laboratory for my PhD studies! I am very grateful that I met her and joined her lab as her passion for mass spec imaging and its applications in biomedical research is surely contagious. During my PhD I used mass spec imaging for various projects related to ovarian cancer proliferation and diagnosis and also did some method development to test other MSI methods.

What do you think MSIS brings to the MSI field? What else would you like to see from the society?

I think it is great to have a platform and community where scientists working in mass spec imaging are able to meet and discuss exciting new results as well as ongoing challenges that we all encounter in the field and how to address them. It is a great place to network as well!

Have you participated in OurCon and if yes what are your best memories? (please share photos if you have)

Unfortunately, I have not! I have been able to meet a lot of the MSI community in other conferences such as ASMS and MSACL but I sure would love to attend OurCon in the near future (hopefully in person!).

What drives your enthusiasm for the field of MS imaging?

I think what drives my enthusiasm is particularly seeing how many exciting applications it has and can have in clinical research. I think there is still a lot to explore with these technologies. Now, doing my postdoc in a lab more focused in cancer biology and early detection and diagnosis, I really enjoy teaching my fellow peers about the capabilities of MSI methods and the type of information that you can obtain with these analyses. I think that working together with clinicians and cancer biologists will be critical to continue improving MSI methods to make them more useful for these type of applications and become more routinely used in clinical settings.

How do you think the field will be in 5-10 years from now?

That is a hard question! I would love to see it being a more routine tool to make discoveries in cancer biology and assist in diagnosis and stratification. We see technologies such as imaging mass cytometry that have started to spark so much interest among pathologists with its high spatial resolution and sensitivity for protein

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Don't miss…
In the next issue

We are discussing MS Imaging with:

The newly elected MSIS board member, ***Dr Gregory Hamm*** from AstraZeneca

AND

MSIS Vice President **Prof Martina Marchetti-Deschmann**

imaging. I also think there is much promise in lipidomic research where they are still many unknowns and interesting questions to ask.

What are the main challenges and the biggest success you have encountered in your career and what do you think can be improved in the field of MSI?

During grad school I had a project that was very technical and involved some experiments that required lots of preparation and optimization. I think that carrying through that project was a big challenge research-wise but also mentally, trying to stay motivated through all the hurdles, and so at the end I consider completing that study a big success. I have also been very fortunate and experienced many exciting developments in the laboratory, such as the studies with the MasSpec Pen, from doing the initial tests in the lab to being able to witness its first use in the operating room was a truly incredible feat! I think there is still much to improve with MSI, such as improving sensitivity for compounds of interest, standardization, better software and data analysis, etc, but I do see all of these being continually addressed by the community. Ultimately, I think it is still important to acknowledge that even though MSI methods will always have their limitations, we have to focus on exploiting their current capabilities with tailored applications which I think are still very powerful and useful!

What advice would you give to a student entering an MSc/PhD project?

My first advice would be to make sure that you understand the background and objectives of your project, know why it is that you are doing what you are doing! I think that is very important so that you can plan your experiments well and analyze your data adequately to address the questions you are asking. Also, use those years in your MSc or PhD studies to learn as much as you can! And try to enjoy it as much as you can as well, even though some days will seem very challenging, you will realize at the end how much you have accomplished and grown.

MSIS Executive Committee

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