



# Light Sheet Fluorescence Microscopy International Conference

31 August – 3 September 2016 Sheffield

In September 2016 the leading lights in the world of light-sheet-based imaging will be gathering at the edge of the Peak District in Sheffield for the 3rd International Light-Sheet Fluorescence Microscopy Conference.

Following on from the previous successful meetings in Barcelona and Genoa, this open conference brings together developers and users of light-sheet microscopy to provide the latest in what is new in technology development and application.

Light-Sheet Fluorescence Microscopy (LSFM) is a powerful technique for live imaging. The LSFM meeting is the only international conference dedicated to light-sheet microscopy, and with key figures in the field coming from the United States, Japan and all over Europe, we expect another excellent meeting. Applications are encouraged from light-sheet enthusiasts, developers, users or researchers interested in learning more about this technique.

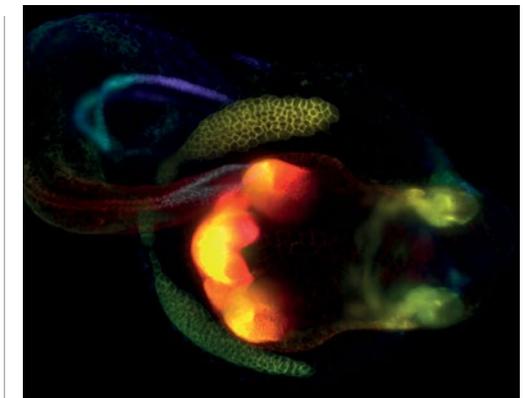
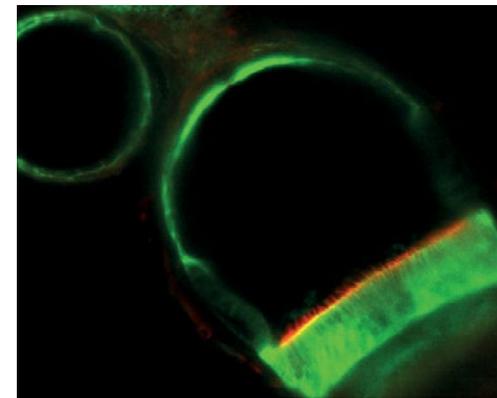
## Light-sheet fluorescence microscopy: optical sectioning at low light

Minimising photodamage is crucial for studies of developing organisms. With careful light exposure, phototoxicity can be reduced to physiologically manageable levels, ensuring that an organism's behaviour is normal and can be observed for long periods. Over the years, it has emerged that many conventional fluorescence microscopes use illumination at cell-damaging levels, leading to inconsistent and even misleading results. Light-sheet fluorescence microscopy (LSFM), also known as selective plane illumination microscopy (SPIM), is perfectly suited to minimising such photodamage. In its modern form, LSFM has been around for just over a decade, during which time this technique has allowed spectacular real-time imaging of developing organisms by combining high sensitivity with optical sectioning. It does so simply by uncoupling the illumination path from the detection path. Conventional approaches such as widefield fluorescence microscopy or confocal laser scanning microscopy illuminate the sample through the objective. As a consequence, for each frame acquired, multiple focal depths are illuminated. LSFM, by contrast, forms a sheet of light to illuminate the sample just in the focal plane that is being acquired. LSFM also uses sensitive cameras rather than photomultipliers, combining the best of both worlds: the low light level (and high speed) of widefield microscopy, and the optical sectioning of the confocal.

The scientific organising committee looks forward to welcoming delegates to Sheffield, a city with a great history of innovation and of microscopy. Henry Clifton Sorby FRS, a pioneer of microscopy techniques, worked here in the nineteenth century. Currently, the University of Sheffield is home to *Imagine: Imaging Life*, a multi-million collaborative project between physicists, chemists and life

scientists aimed at the development and exploitation of new microscopy technologies, including light-sheet imaging.

Professor Elizabeth Smythe, Head of the Wolfson Light Microscopy Facility at the University of Sheffield, writes: 'I am absolutely delighted to welcome the 2016 Light-Sheet Fluorescence Microscopy meeting



to the University of Sheffield. The recent acquisition of two light-sheet microscopes to our existing complement of microscopes has significantly extended the range of biological questions that can be addressed. We anticipate that by bringing together biologists, physicists and engineers this meeting will foster exciting new collaborations and extend understanding of the possibilities offered by this state-of-the-art technology.'

## Programme highlights

LSFM2016 will be held from Wednesday 31st August to Saturday 3rd September 2016, at The Edge conference facility in Sheffield, UK. The programme will feature a mixture of invited and

selected talks, poster sessions and round table workshops covering a wide range of topics, from light-sheet live imaging and applications, through to new engineering developments and optimisation of techniques. Presentations will also span the range from super-resolution through to ultramicroscopy, using home-built, open source and commercial systems. The meeting will also include sessions on the challenges of big data and image analysis.

Prior to the Plenary talks on the Wednesday evening there will be a series of workshops for different mounting techniques, as well as demonstrations of the commercial systems from Leica and Zeiss.

A special highlight features the second EMBO





wanting to stay on and explore after the meeting, the varied countryside of the Peak District is right on Sheffield's doorstep.

A detailed, up to date programme and registration details can be found at the meeting website: [www.lsfm2016.org](http://www.lsfm2016.org)

### Presentations

The first talks will begin on the Wednesday with an evening of Plenary presentations by three of our invited speakers, including our keynote talk by Hari Shroff. The talks will be held in the University of Sheffield's Firth Hall, and will be followed by a drinks reception.

We are delighted to have many key players in the field giving talks and our invited speakers will also begin each of the different scientific sessions, which will be followed by four 15-minute oral presentations from selected abstracts.

Posters will be exhibited throughout the conference and there will be a dedicated session on the

course on lightsheet microscopy. This practical course takes place just before the conference, and comprehensively introduces the light sheet microscopy paradigm to a new generation of scientists. The group of students with the most impressive results achieved during the course are invited to present the findings at the conference. This will demonstrate what can be achieved in a concentrated and guided effort over ten days by newcomers to the field.

A full social programme of evening events is planned, including the conference dinner at Sheffield's beautiful City Hall Ballroom. For those

Thursday afternoon to both view the posters and to hear flash talks from some of the poster presenters. All posters will be judged in a poster competition for the best poster and best image prizes.

A selection of our commercial sponsors for the meeting will also give short oral presentations in a dedicated session, and there will be the opportunity to talk to representatives from a range of sponsoring companies throughout the meeting.

### Networking opportunities

The Edge is the perfect venue to meet other delegates: talks, meals, posters and exhibitors are all in the same location.

In addition, during the coffee breaks there will time to meet the speakers from the previous session and to view the posters and exhibitors.

During the lunch break there will be optional round table discussions, involving experts in the field presenting and discussing an overview of different light-sheet-related topics.

### Exhibitors

We already have a number of sponsors on board for the meeting, and a dedicated area in the same venue will be reserved as exhibition space. If you would like to sponsor this meeting, please contact Chloe Goode, [chloe@rms.org.uk](mailto:chloe@rms.org.uk)

### Venue

The Edge is situated near to the centre of Sheffield (a 20-minute walk) while still being close enough to the Peak District to walk, run or cycle into the countryside in under an hour. The Conference Centre is within a landscaped university student village with plenty of affordable accommodation and its own hotel.

The conference facilities include the auditorium, cafeteria and large bar area that will be available throughout the meeting. All meals will be provided, including evening drinks and a buffet reception on the Wednesday, and the Conference Dinner on the Friday evening, which will be held at the Sheffield City Hall Ballroom.

### Programme sessions

- Lightsheet live imaging & applications
- Lightsheet engineering
- High-speed, high-resolution, low-light techniques
- Ultramicroscopy & optical clearing
- Image analysis & big data challenges

### Invited Speakers

- Dr Hari Shroff, National Institutes of Health, Bethesda
- Dr. Francesca Cella-Zanacchi (IIT, NAPH, Genoa)
- Dr. Elizabeth Hillman (Columbia University, New York)
- Dr. Jan Huisken (MPI-CBG, Dresden)
- Prof. Dr. Alexis Maizel (Heidelberg University)
- Dr. Francesco Pampaloni (Frankfurt)
- Dr. Willy Supatto (CNRS, Paris)
- Prof. Jason Swedlow (Dundee)
- Dr. Jim Swoger (CRG, Barcelona)
- Prof. Hiroki Ueda (Tokyo)
- Dr. Laura Young (Durham)

### Workshops

- Demonstrations and training on Leica and Zeiss commercial systems
- Round table discussion groups with leading experts in the field



**Registration and Abstract Submission are now open for this conference.**

[www.lsfm2016.org](http://www.lsfm2016.org)