

DANISH BIOIMAGING NETWORK NEWSLETTER

September 2018: Highlight

NETWORK NEWS

- Danish Bioimaging network performance report for the period 2017-2018 is added to the newsletter.

Contact Us

info@danishbioimaging.dk



[Danish Bioimaging network meeting 2018:](#)

02.10.2018, SDU Odense,

Registration: [fill the registration form and submit your abstract for a poster or a talk.](#)

Registration deadline is extended: 20th of September.

Keynote speaker: [Jennifer Lippincott-Schwartz](#), Janelia Research Campus.

Confirmed Speakers: [Jonas Ries](#), EMBL, Heidelberg

[Rainer Heintzmann](#), Friedrich Schiller University, Jena

[Paul Wiseman](#), McGill University, Montreal, Canada

[Jakub Sedzinski](#), Danish Stem Cells center

[Marja Jäätelä](#), Danish Cancer Society

[Christian Janfelt](#), Department of Pharmacy, Copenhagen Uni

DBI sponsors a prize for the best poster.

New DBI initiative, please support it:

We would like to share knowledge in our bioimaging communities. Therefore, we would like to ask you to participate in a very short survey: [Survey](#)

Revolutionize Your Confocal Imaging

ZEISS LSM 880 with Airyscan

[> Learn more](#)

MORE SIGNAL
MORE RESOLUTION
MORE SPEED



There is one advertisement slot in each newsletter, contact info@danishbioimaging.dk to book it.

OPEN CALLS (NEW SECTION AT THE WEBPAGE)

- **#LOCAL** [DBI Open Call 2018/19](#) to promote interactions between network members, for example for courses, meeting and seminars. Applications are welcome for 3.000 – 10.000 DKK.
- [2nd CORBEL Open Call for Research Projects](#), (up to 5000€) open access to cutting edge technologies and services available at research infrastructures working in fields such as advanced imaging technologies, high-throughput screening or structural biology and more. Deadline 31st of October
- [Short Term Scientific Missions \(STSMs\) to support Early Career Investigators \(ECIs\) and Experienced BioImage Analysts](#), NEUBIAS. Applications reviewed at the end of each month.
- **#LOCAL SDU:** [The SDU-Imaging steering group](#) invites applications to support Imaging related workshops taking place in 2019. It is expected to fund 3-4 workshops with 15-30.000 DKr each. Deadline 1st of October

COURSES (MORE ONLINE)



- [NEUBIAS BioImage Analysis Schools](#), Edinburgh, UK, October 16-19.
- **#LOCAL** [Electron Microscopy Course](#), Copenhagen, October 15-26.
- **#LOCAL** [Biophotonics PhD course](#), Odense, January 21-25

CONFERENCES AND WORKSHOPS (MORE ONLINE)

- **#LOCAL** [Danish Bioimaging network meeting 2018/SDU Imaging meeting](#): **02.10.2018**, SDU, Odense
- **#LOCAL** [Image Analysis workshop](#), 03.10.2018, SDU, Odense
- [Labeling & Nanoscopy 2018](#), Heidelberg, 5-7th of November 2018, organizers: Stefan W. Hell, Stefan Jakobs, Markus Elsner, Steffen J. Sahl
- [Translational Biomedical Imaging](#), November 26-27, G nzburg, Germany
- **#LOCAL** [Membrane Imaging: Structure and Dynamics in cells and models](#), December 4, 2018. SDU, Odense, Denmark
- [From Images to Knowledge with ImageJ & Friends](#), December 6-8, EMBL
- [The 3rd NEUBIAS Conference](#), February 2-8, Luxembourg
- [18th Annual Workshop on FLIM and FRET Microscopy](#), March 11-15, Charlottesville, USA

SEMINARS

- **#LOCAL** [High Content Screening Seminar & Usergroup Meeting. PerkinElmer](#), **October 4th** at 9am, M rsk Tower, 15 floor, room 7.15.92. Copenhagen, Denmark

JOB OPPENING

- [Postdoc Alzheimer's disease, Goethe University, Frankfurt, Germany](#)
- [Light Microscopy Specialist](#), Dandee, Scotland
- [Research Associate/Postdoctoral Fellow](#), Montreal, Quebec, Canada
- For more position visit https://www.danishbioimaging.dk/?post_type=jobs

WORK GROUPS CONTACT INFORMATION

WG1: Image Analysis tools and data management

Sune Darkner, DIKU – darkner@di.ku.dk

WG2: Pre-clinical imaging

Eastern Denmark: Henrik El Ali, KU – helali@sund.ku.dk

Western Denmark: Michael Pedersen, AU – michael@clin.au.dk

WG3: Electron Microscopy

Casper Hempel, DTU, Nanotech – cash@nanotech.dtu.dk

Alexander Shulz, KU-SCIENCE – als@plen.ku.dk

WG4: Light Microscopy

Aarhus/Aalborg – Morten Nielsen, AU – mn@biomed.au.dk

Odense – Jonathan Brewer, SDU – brewer@memphys.sdu.dk

WG5: Correlation and connectivity please come forward if you would like to join

WG6: Training and knowledge exchange

Jutta Maria Bulkescher, SUND-KU – jutta.bulkescher@sund.ku.dk

DBI coordinator: Vita Solovyeva vita@sdu.dk

Danish BioImaging annual report

2017/2018



Danish BioImaging (DBI) was officially created April 2017, under a three years collaboration agreement signed by a national consortium of Danish universities, research institutions and commercial companies (see table 1: DBI partners) with a common interest in bioimaging as a tool for life science. It was established to foster research collaboration, share expertise, best practice and bioimaging research infrastructures within the medical and natural sciences, nationally and internationally. During the first year, DBI has grown from 120 to 205 members.

First Danish Bioimaging meeting took place in Copenhagen on the 8th of November 2017 and gathered about 180 participants.

Networking

The first DBI scientific meeting took place in the Faculty of Health and Medical Sciences, University of Copenhagen on the 8th of November 2017. The communities needs and interest were clear, as registration had to be closed due to limitations in forum capacity of the venue. With more than 180 registrations, the meeting gathered scientists from all Danish Universities (AU, DTU, KU, RUC, SDU and AaU), Lund University, Helmholtz Zentrum Berlin, the Danish Cancer Society, Steno Diabetes Center, *Det Nationale Forskningscenter for Arbejdsmiljø*, Research Center, 3 hospitals (Hvidovre Hospital, Bispebjerg Hospital and Rigshospitalet), 2 Farma companies (LEO Pharma and Novo Nordisk), 11 commercial companies (Agilent, BioNordika, Carl Zeiss, ChemoMetec, GE Healthcare, Holm&Halby, Leica, Nikon, Olympus, PerkinElmer and Visiopharm). Speakers included Prof. Soichiro Yamada from the Biomedical Engineering Department, at the University of California, USA; Henrik Lauridsen, from the Clinical Medicine Department, at Aarhus University Hospital; Jutta Maria Bulkescher, from the Center for Protein Research and Danish Stem Cell Center, at the University of Copenhagen; Lene N. Nejsum, from the Clinical Medicine Department, at Aarhus University; Jesper Nylandsted, from the Membrane Integrity Group, at the Danish Cancer Society Research Center; Irina Iachina, from the University of Southern Denmark; Poul Kempen, the Department of Micro- and Nanotechnology, at the Technical University of Denmark; Emilie Tresse-Gommeaux, from BRIC, Copenhagen University; Jeppe Thagaard, from Visiopharm and DTU compute; and Hans J.T. Stephensen, from the Image group, at the Computer Science Department, University of Copenhagen. Short talks from selected posters were followed by a poster session with snacks and drinks to boost interaction and facilitate networking.



Education, Knowledge exchange and Bioimaging career path

In spring 2018, DBI hosted the **first DBI Cross Institutional Bioimaging course**, organized by:

Spring 2018	Content	Teachers and trainers	Location
Tuesday January 30	Introduction to Fluorescence Microscopy and Image Analysis	Jonathan Brewer & Eva Arnspang Christensen	SDU
Tuesday February 6	Confocal Microscopy	Clara Prats, Thomas H Braunstein and Laure Plantard	KU
Tuesday February 13	Non-invasive imaging modalities (PET-SPECT-CT-R)	Henrik H. El Ali	KU
Tuesday February 20	Image Analysis	Jon Sparring, Sune Darkner	KU
Tuesday February 27	Single particle & Fluorescent Proteins	Victoria Birkedal, Lene Nejsum and Morten Schallburg Nielsen	AU
Tuesday March 6	Super-resolution, STED, ICS and Raman	Eva Arnspang Christensen Jonathan Brewer & Martin Hedegaard	SDU
Tuesday March 13	Image analysis	Rasmus Reinhold Paulsen Anders Nymark Christensen, Anders Bjorholm Dahl	DTU
Tuesday March 20	Electron Microscopy	Klaus Qvortrup, Michael J Johnson and Tillmann Pape	KU
Tuesday April 10	Presentation of personal projects and per-review Examination	Eva Arnspang Christensen & Jonathan Brewer SDU Clara Prats & Thomas H Braunstein KU	SDU KU

Seventeen PhD students from different universities and research institutions attended the course, visited 8 different labs around Denmark and learned from bioimage acquisition and image analysis experts. The course gave unique possibility for PhD students to build their network within the Danish Bioimaging community and experience interdisciplinary environments. The overall response was very positive, 100% of participants will recommend this course for their colleagues. The next course is planned for the Fall semester 2019. DBI allocated 10.000 DK to support travelling costs for the PhD students and other associated costs.

Boost international interactions and collaborations

Danish BioImaging Seminar

Imaging life with the new frontiers in spatial and temporal resolution



by Dr. Teng-Leong Chew
Director of Advanced Imaging Center at Janelia
Howard Hughes Medical Institute, Virginia, USA
March 12th at 11:00 - Nielsine Auditorium
Faculty of Health and Medical Sciences, University of Copenhagen

DBI organized two seminars by **Dr. Teng Leong Chew**, **Director for the Advanced Imaging Center at Janelia Research campus**. Dr. Teng-Leon talked about “Imaging life with the new frontiers in spatial and temporal resolution” at the University of Copenhagen and at the Southern Denmark University on March 12 and 13th

2018, respectively. After the talk, Dr. Teng-Leong had one-to-one meeting with groups interested in having access to the latest microscopy applications at Janelia.

DBI is organizing the two life science sessions at **SCANDEM 2018 conference** (the 69th Annual Conference of the Nordic Microscopy Society). One of the sessions will focus on single cell imaging, while the other will focus on imaging of multicellular systems/organs. The conference is organized by the Center for Electron Nanoscopy at DTU, Kg. Lyngby, DENMARK, June 25-28, 2018.

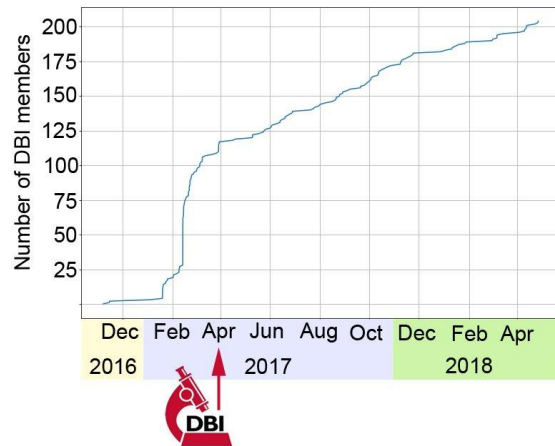
DBI aims at joining the European research infrastructure EuroBioImaging (EuBI - www.eurobioimaging.eu). With this view, Troels Rasmussen from the Ministry of High Education and Science and Clara Prats from the DBI Management Committee have attended as observers the last EuBI board meetings; January 19th 2017 - 12th EuIB Meeting in Porto, Portugal, and July 5th, 2017 - 13th EuBI Interim Board Meeting in Frankfurt. In addition, DBI will meet with EuBI coordinator, Antje Keppler at the next ELMi meeting (Dublin June 2018) to coordinate the steps for DBI to join

EuBI and with members of other Nordic Bioimaging networks to discuss the creation of a **Nordic Bioimaging Network** to link the existing networks on the different Nordic countries.

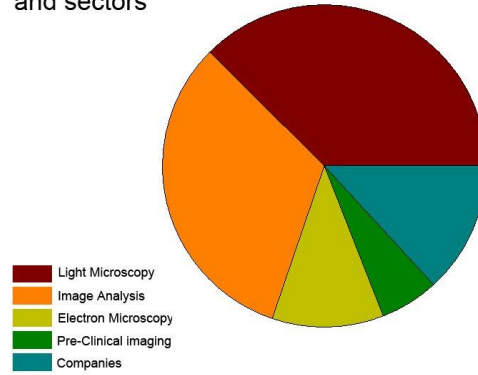
DBI management and organization

The DBI management committee (DBI-MC) is composed of Jon Sparring (DIKU), Clara Prats Gavalda (SUND KU), Christoffel Dinant (Danish Cancer Society), Casper Hempel (Nanotech DTU); Michael Lisby (bio KU), Michael Pedersen (SUND AU), Morten Schallburg Nielsen (Biomedicin AU), Jonathan R. Brewer (SDU) and Rasmus Reinhold Paulsen (DTU compute) and has the mandate to ensure the implementation of DBI objectives. During the 2017/2018 year, the DBI-MC has met 6 times (see Appendix 1). Troels Rasmussens from the Ministry of High Education and Science was invited to inform about the status of the Danish road map proposal DBN and, discuss how DBI can become part of the ESFRI EuBI.

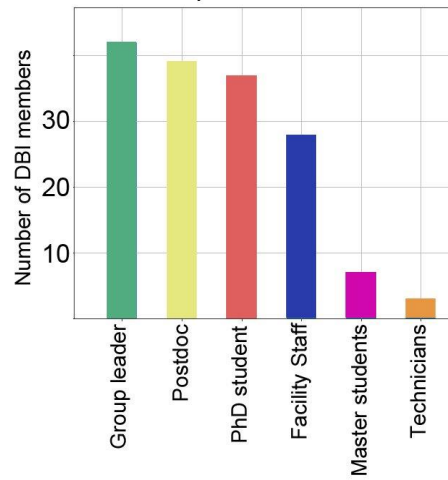
(a)
DBI is continuously growing



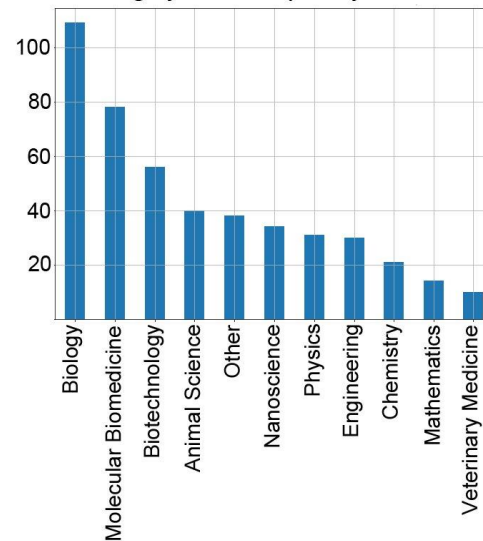
(b)
DBI gathers professionals from different fields and sectors



(c)
DBI members - positions



(d)
DBI is a highly interdisciplinary network



Appendix 1 Management meetings dates

24.03.2017

16.06.2017


08.09.2017

16.11.2017

09.01.2018

09.04.2018


Appendix 2 1st Danish Bioimaging Network meeting program



1st Scientific meeting in Danish Bioimaging Network

8th of November 2017
The Faculty of Health and Medical Sciences, University of Copenhagen
Haderup auditorium, Nørre Alle 20, Copenhagen.

10:50	Welcome and Network updates Clara Prats & Morten Schallburg Nielsen
Morning session. Chair: Michael Lisby and Christoffer Dinant	
11:05-11:35	Keynote - Force-dependent regulation of adhesive contacts Soichiro Yamada, Biomedical Engineering Department, University of California, Davis, USA.
11:35-11:55	Overview of in vivo imaging in animal experiments Henrik Lauridsen, Clinical Medicine Department, Aarhus University Hospital
11:55-12:15	Whole tissue imaging of macrophage subsets in a mouse model of ovarian cancer Anders Etzerodt, Biomedical Department, Aarhus University
12:15-12:35	High-Throughput Screening – Challenges & Opportunities Jutta Maria Bulkescher, Center for Protein Research and Danish Stem Cell Center, University of Copenhagen
12:30-13:15	Lunch Sponsored by Leica
Mid-session. Chair: Casper Hempel and Jonathan Brewer	
13:15-13:35	Aquaporin-5 and the effects on cell adhesion Lene N. Nejsum, Clinical Medicine Department, Aarhus University
13:35-13:55	Membrane damage and repair Jesper Nylandsted, Membrane Integrity Group, Cell Death and Metabolism, Danish Cancer Society Research Center
13:55-14:15	Linear- and nonlinear optical microscopy combined with force measurements for the characterization of spider silk. Irina Iachina, University of Southern Denmark
14:15-14:35	Electron microscopy characterization of nanomaterials; ex-situ, in-situ and in-vivo. Paul Kempen, DTU NANOTECH, Department of Micro- and Nanotechnology, Technical University of Denmark
14:35-14:55	Coffee break Sponsored by GE Healthcare
Afternoon session. Chair: Jon Sparring and Rasmus Reinhold Paulsen	
14:55-15:15	Serial block face, segmentation and 3D rendering with Amira Emilie Tresse-Gommeaux, BRIC, Copenhagen University
15:15-15:35	Application of deep learning for tissue-based cancer screening and research Jeppe Thagaard, Visiopharm and DTU compute
15:35-15:55	Measuring sub-cellular structures in neurons from electron microscopy Hans J.T. Stephensen, The Image group, Computer Science Department, University of Copenhagen
15:55-16:30	Selected Flash Talks
16:30-17:45	Poster session and networking – find your new collaborator! Beers and snacks will be sponsored by Holm & Halby
17:45-18:00	Image and Poster prizes Prizes sponsored by Zeiss



.... or go to: goo.gl/A9V9mQ

Appendix 3 Cross institutional Bioimaging PhD course Program

January 30	Fluorescence Microscopy, two photon and Image Analysis	Jonathan Brewer & Eva Arnspang Christensen	SDU
February 6	Confocal Microscopy	Clara Prats	KU
February 13	Non-invasive imaging modalities (PET-SPECT-CT-R)	Henrik H. El Ali	KU
February 20	Image Analysis	Jon Sparring, Sune Darkner	KU
February 27	Single particle & Fluorescent Proteins	Victoria Birkedal, Lene Nejsun and Morten Schallburg Nielsen	AU
March 6	Super-resolution, STED, ICS and Raman	Eva Arnspang Christensen, Jonathan Brewer & Martin Hedegaard	SDU
March 13	Image analysis	Rasmus Reinhold Paulsen, Anders Nymark Christensen, Anders Bjorholm Dahl	DTU
March 20	EM	Klaus Qvortrup	KU
April 3	Preparation for the exam		Home
April 10/20	Evaluation and Student Talks	Eva Arnspang Christensen & Jonathan Brewer SDU; Clara Prats KU	KU/SDU

Appendix 4 Cross institutional Bioimaging PhD course description

Objectives of the course:

The Cross Institutional Bioimaging Ph.D. course is interdisciplinary and cross-institutional and will be given by a series of lecturers who are experts within each their field of bioimaging. The course will take place at different institutions in order to expose the students to different research groups, their researchers and experimental research facilities. The course will thus give the students a unique opportunity of orienting him or herself within an active and diverse field of interdisciplinary science within bioimaging.

The course is relevant for PhD students within medicine, physics, chemistry, biochemistry, molecular biology, nano-bioscience, pharmaceutical sciences, agricultural science or biology. The emphasis of the course is a tour of all bioimaging techniques available in Denmark and will cover subjects like live cell imaging, spinning disk microscopy, electron microscopy, photoactivated localization microscopy, single particle techniques, structured illumination, stimulated emission depletion microscopy, imaging of neurons and cell migration.

Time schedule for the course:

The course starts January 30th 2018, and **consecutive Tuesdays for 9 weeks at 4 different universities** and by different lecturers. Each day of the course covers around 8 hours, from 09:30-17:30. In general, the morning session will consist of a set of lectures and the afternoon session will predominantly involve either the student's active participation in experiments, specific numerical exercises, or inspection of the local experimental facilities. [Program.](#)

Course credit and evaluation

The workload of the course corresponds to 9 ECTS points, the total workload includes reading material for each lecture and the preparation of the final talk (presentation). Credit for the course requires the student's presence at 7 of 9 lectures. For missed lectures students will have to write 3 pages reports on the topic of the missed lecture. Also the students presence on the exam is mandatory.

The course is evaluated with: Internal oral examination with co-examiner assessed passed/not passed at KU and SDU depending where for students it is more convenient. 20 minutes presentation of a project and 15 minutes questions from examiners and from a student opponent. Each student has to be an opponent for one presentation of another student. In the presentation each student has to present a description of an experiment using one of the applications described in the course and include an image analysis strategy. The task for the presentation will be given in advance (on the last lecture day the 20th of March).

In order to get credits for the course, every student has to be present at all the other students' talks in their session (at KU / SDU) on the exam day.

Registration and transportation: Registration is open by email to

[vita\(at\)bmb.sdu.dk](mailto:vita(at)bmb.sdu.dk)

Prerequisites:

PhD course for students with Master Degree in Physics, Engineering, Life Science, Biology, Medicine
Accepted at a PhD program

Course responsible:

Eva Arnsfang Christensen and Jonathan Brewer (SDU)

Lecturers:

(AU) Lene Niemann Nejsum, Morten Nielsen, Victoria Birkedal

(DTU) Rasmus Reinhold Paulsen, Anders Nymark Christensen, Anders Bjorholm Dahl

(KU) Clara Prats, Klaus Qvortrup, Henrik H. El Ali, Sune Darkner, Jon Sporning

(SDU) Eva Arnsfang Christensen, Martin Hedegaard, Jonathan Brewer

Literature:

Will be announced every week during the course.

Course homepage:

All materials will be published on the open black board platform (SDU).

If you have any questions, please contact Vita Solovyeva, Email:

Short lecture description

Electron microscopy: Klaus Qvortrup

The course provides an introduction to the essential grounding in the basic principles of electron microscopy, covering topics such as electron optics, electromagnetic lenses, principles of transmission and scanning electron microscopy, electron sources, vacuum systems, specimen-electron interactions and diffraction. The state-of-the-art facilities available at CFIM allow for a strong practical element of demonstrations of both cryo- and room temperature electron microscopy. The course will be run by experienced microscopists in a relaxed atmosphere with the aim of promoting discussion and exchange of ideas between students and tutors.

Single particle & Fluorescent Proteins: Morten Nielsen

In this lecture we will focus on how to study receptor trafficking using imaging technologies. We will go through methods to follow endocytic receptors from the surface and through the endo-lysosomal system and demonstrate how we analyze if receptors are transcytosed in polarized endothelial and epithelial cells.

Confocal Microscopy: Clara Prats

Students will be introduced to the Principles and Essentials of Single Point Scanning Microscopy. Lectures and hands-on practical exercises will be combined to teach the students the critical components of a Confocal Microscope and, how to properly construct imaging light paths and settings to avoid artifacts and collect proper bioimaging data

The basic principals of non invasive imaging modalities and their in vivo applications in preclinical research: Henrik H. El Ali

The course session provides an introduction to the technique of non invasive 3D imaging modalities (such as PET/SPECT/CT/MRI) and what applications it can be used for in the field of molecular imaging. The aim is to provide the students with basic knowledge about the different non invasive imaging techniques and how to use/select right technique for different applications.

The basic physical principles, instrumentations including data acquisition and image formation, post-processing, displaying of the images will be covered in the morning session. In the afternoon session, factors affecting image quality and quantification will be discussed. In addition, hands-on practical exercises related to clinical and preclinical applications will be provided to promote discussion and exchange of ideas between students about the selection of “best” imaging technique application for their own research field. In the end of the course session the students will improve their ability to understand the limitation of the different imaging technologies and be able to properly select the imaging technique that best answer their scientific question.

Fluorescence Microscopy, two photon and Image Analysis Jonathan Brewer & Eva Arnspang Christensen

Photoactivatable localization microscopy (PALM) is a recent developed technique which is optimal for membranes. It takes benefit from activating a subset of the fluorophores at each timepoint in the sample and reconstituting the full image from mapped positions in a series of images. K-space image correlation spectroscopy is a technique in which the bulk diffusion coefficient is calculated after conventional epi fluorescence or TIRF imaging.

Image Analysis Jon Sporring, Sune Darkner

Image Analysis Rasmus Reinhold Paulsen, Anders Nymark Christensen, Anders Bjorholm Dahl

Super-resolution, STED, ICS and Raman Eva Arnspang Christensen, Jonathan Brewer & Martin Hedegaard

Confocal Raman imaging is a label free imaging technique based entirely on molecular vibrations. This course will include an introduction to basic working principles and choice of instrumentation including lasers, microscopes and spectrometers. In addition, there will be an introduction to pre-processing and analysis of Raman imaging data.