ESMRMB

European Society for Magnetic Resonance in Medicine and Biology

School of MRI 2017

Educational courses for physicians and MR radiographers/technologists

Advanced MR Imaging of the Musculoskeletal System
May 18–19, St. Petersburg/RU

Advanced Cardiac MR Imaging
May 18–20, Basel/CH

Clinical fMRI & DTI - Theory and Practice
June 15–17, Porto/PT

Advanced Neuro Imaging: Diffusion, Perfusion, Spectroscopy
August 31 – September 2, Geneva/CH

Advanced MR Imaging in Paediatric Radiology
September 7–9, Lille/FR

Advanced MR Imaging of the Abdomen
September 14–16, Palermo/IT

Advanced MR Imaging of the Musculoskeletal System
September 28–30, Lisbon/PT

Advanced Breast & Female Pelvis MR Imaging
September 28–30, Krakow/PL

MR Safety
October 5–7, Bolzano/IT

Body Diffusion-Weighted MRI: Solving Clinical Problems and Diagnostic Dilemmas
November 8–10, Brussels/BE

Advanced Head & Neck MR Imaging
November 16–18, St. Julian's/MT

eLearning: Basic Course on Applied MR Techniques

myESR.org/esor

Education in partnership

www.esmrmb.org

ESOR EUROPEAN SCHOOL OF RADIOLOGY

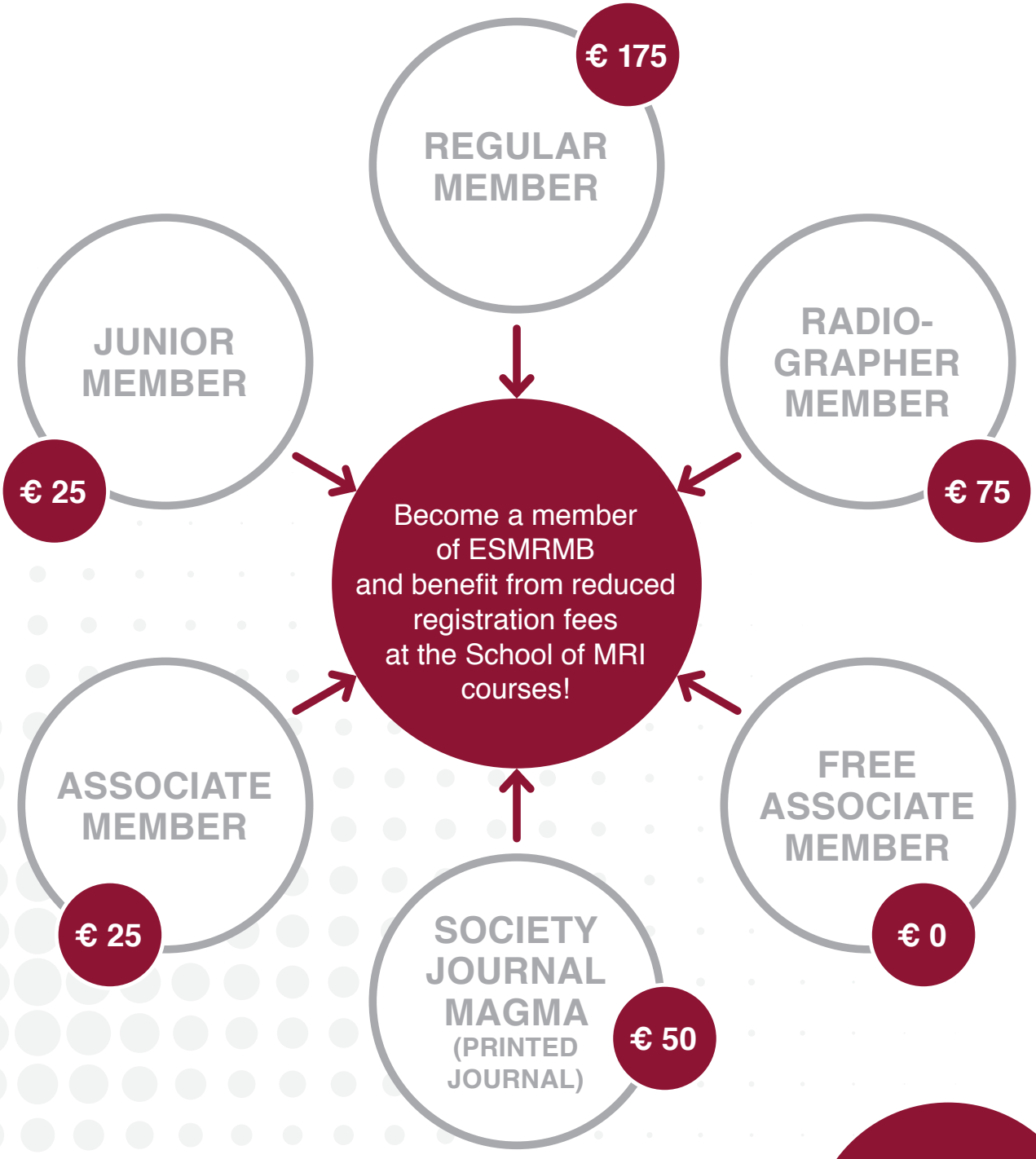
ESR EUROPEAN SOCIETY OF RADIOLOGY

ESMRMB

European Society for Magnetic Resonance in Medicine and Biology

Join the European Forum for MR Research and Clinical Practice

ESMRMB Membership Types



More information at **www.esmrmb.org**

ESMRMB Office: Neutorgasse 9, AT-1010 Vienna
www.esmrmb.org

Welcome from the Director of the School of MRI Programme

Dear Colleagues,

It is a great pleasure for me to inform you that after another successful year of 2016 we are delighted to offer all our courses again in 2017. We are proud of our long-standing collaboration with the course organisers who compiled another great programme for 2017. Yet, we should not forget the effort of the local organisers, who are essential for the local arrangement and the promotion of the courses in each country. Hence, the success of the individual courses also depends on their active engagement.

As an outlook for 2017, we plan 10 courses in Europe as well as one in Russia. We are more than pleased to be organising a course once again in Russia after a very successful course in Moscow in 2008. Our MSK course in St. Petersburg will be held by both our excellent European faculty as well as local speakers from Russia. Although the course will be reduced from 3 to 2 days, it will be an exceptional excursion to which we hope to welcome also many non-Russian participants.
Bear in mind that our MSK course will certainly be on the schedule in its regular format in the beautiful city of Lisbon and will again encompass the best speakers of their expertise. Lisbon is also a city with authentic history and individual charm located in a wide variety of beautiful landscapes.

Furthermore, I would like to inform you that the Body Diffusion-Weighted course will be again part of the programme, but this time in a new format, meaning the topics and learning objectives are adjusted to meet the current needs in the field. Therefore, you should read on to find out what new things this course has to offer!

In 2017, we are also offering our other courses in very appealing cities! Besides our Paediatric Radiology course in Lille, two courses will take place in Switzerland, namely in Basel and Geneva. Also, the School of MRI is heading South, as our Advanced Head & Neck MR Imaging course is planned in Malta, the course on Clinical fMRI & DTI is going to be in Porto, and two courses take us to beautiful Italy; more precisely to Palermo and Bolzano. Naturally, you will find more information on each city and topic in this brochure.

Moreover, for the very first time we offered online education within the School of MRI in 2016. Following the huge success of last year, we would like to offer also this course once again in 2017. As before, over the course of seven weeks, the course will concern one topic per lesson. The striking aspect of this web-based teaching is not only its steadily increasing global demand, but also the possibility to learn from anywhere. Due to its great success, eLearning is now an integral part of the School of MRI programme.

Let me end by expressing many thanks to everybody for making such a great programme possible. Besides the course organisers who compile fantastic programmes with brilliant speakers, special thanks also go to the local organisers who host us, as well as to our sponsor without whom it would not be possible to offer such a wide range of courses.

There are plenty of opportunities to expand your knowledge in the field of MRI and I hope to be welcoming you in 2017 either as a participant, teacher, or future organiser.

With my best greetings and best wishes for a healthy and successful 2017,

Prof. Siegfried Trattnig
Director of the ESMRMB School of MRI
Medical University, Vienna/AT

ESMRMB 2017
OCT. 19 – OCT. 21
BARCELONA/ES

ESMRMB
European Society for Magnetic Resonance in Medicine and Biology

34TH ANNUAL SCIENTIFIC MEETING

The European Forum for MR research
and clinical practice
www.esmrmb.org

Organisation Committee

Siegfried Trattnig
Director of the School of MRI
Medical Director of the Centre of Excellence for High-field MR
Department of Radiology
Medical University Vienna/AT

Fred Avni
Radiologist, Department of Radiology
Jeanne de Flandres Hospital, Lille/FR

Jens Bremerich
Radiologist, Department of Radiology
University Hospital of Basel/CH

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Radiologist, Department of Radiology
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Institute of Forensic Medicine
University of Basel/CH

Prudencia Tyrrell
Radiologist, Department of Radiology
Robert Jones and Agnes Hunt Orthopaedic Hospital
Oswestry/UK

Johan Wikström
Radiologist, Department of Radiology
Uppsala University Hospital, Uppsala/SE

Course Secretariat
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ESMRMB OFFICE

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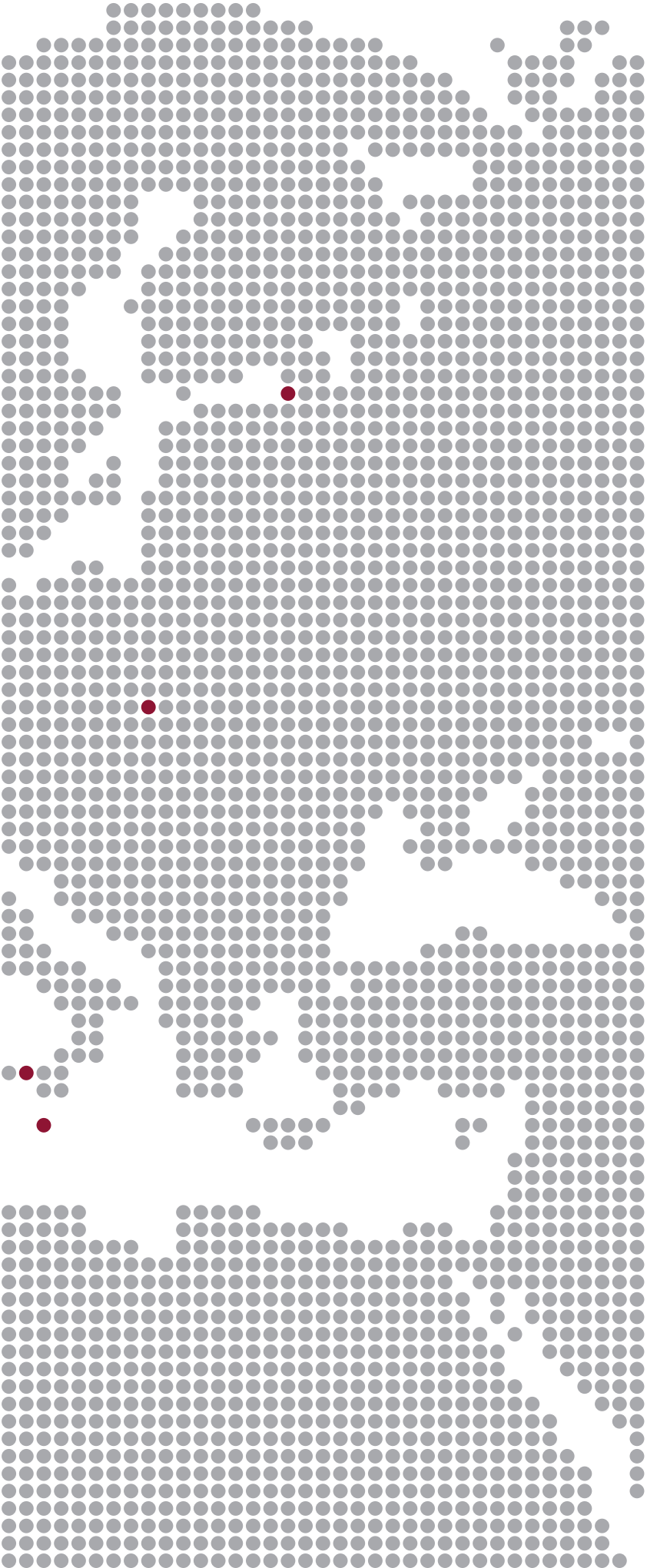
Scientific images kindly provided by the members of the Organisation Committee 2017.

Vienna, February 2017
Coordination: Denise Cosulich, Rebecca Goss
Layout: Barbara Biegl
ESMRMB Office, Vienna/AT

Content



General Information

Do you really know what k-space means, how to optimise contrast in MR images using a FLASH sequence, what a RARE sequence can be used for, and how to interpret artefacts in MR images? Do you know what the so-called BOLD effect is and how to apply diffusion imaging? Do you know the best imaging strategies to analyzing inborn heart defects and the optimal sequence to visualize cartilage? If you are easily able to answer all these questions, there is perhaps no need for you to sign up for the Basic Course on Applied MR Techniques or one of the Advanced Clinical courses of ESMRMB. If not, ESMRMB offers you with its educational courses the opportunity to enhance your knowledge and to get prepared for applying MR techniques in daily business and clinical research.

There are two types of courses available:

The ESMRMB School of MRI offers a Basic Course on Applied MR Techniques, which will enable you to:

- profoundly understand signal and contrast generation in MR images at different conditions (morphological, biophysical and technical)
- use the right measurement sequence for your clinical questions;
- optimise your MR examination (measurement protocol, sequence timing, etc.)
- verify image contrast by modifying measurement sequence or by applying contrast agents
- interpret MR images back to tissue components and functional activities
- understand advanced MRI techniques such as MR angiography, diffusion imaging, perfusion sequences etc.
- ensure safe application of MRI by knowing the involved hardware components and the safety risks

Participation Requirements

The course is particularly aimed at medical doctors (e.g. residents in radiology), biologists or technicians who work with MRI or have an interest in using MRI for research. Participants do not need previous experience in MR techniques and MR physics.

The ESMRMB School of MRI offers Advanced Clinical Courses, which will enable you to:

- ensure optimum use of MRI in the relevant field of MR application
- know the indications and limitations of MRI compared to other imaging modalities
- acquire an in-depth understanding of measurement strategies in the relevant area
- optimise imaging strategies for the best visualisation of underlying structures and diseases
- interpret morphological data correctly back to tissue components and pathologic alterations of tissues
- interpret functional data back to physiological or pathological activities

Participation Requirements

All courses are held at an advanced educational level. Participants should be physicians with well-established knowledge in MRI physics and techniques. In addition, they should have a minimum of 6 months of experience in applied MRI in the relevant field.

- All courses are held in English language.
- The duration of each course is 2,5 days. The courses start either on Thursday between 8 and 9 am or between 1 and 2 pm and last until Saturday between 1 and 2 pm or between 5 or 6 pm. The Body-Diffusion course will take place from Wednesday to Friday.
- The detailed programme of each course as well as the exact time schedule is available on the ESMRMB website.
- 50% of the total teaching time is used for repetitions in small groups (maximum 17 people per group) to intensify the learning experience and offers high interactive teaching with the experts in the respective field.
- A maximum of 65 places per course is available. If less than 40 participants register, ESMRMB reserves the right to cancel a course at the latest 4 weeks prior to its beginning. The course on 'MR Safety' is limited to 35 participants.
- ESMRMB ensures the evaluation of all courses and guarantees professional and didactically experienced teachers.
- A voluntary examination will be held at the end of each course.

Details on the eLearning course can be found on page 30.

Filming and Recording Policy

Filming and recording during the courses is basically not permitted. Exceptions may be granted by the course organiser on-site. If you wish to record any lecture (for your personal use only), please contact the respective lecturer and course organiser for permission.

Accreditation

An application has been made to the UEMS-EACCME for CME accreditation of these events. A certificate of attendance will be available online.
An application for the ESSR Diploma will be made for the MSK course.

Registration Information

For information regarding registration and registration fees, please refer to page 32.
Please note that registration is possible online at www.esmrmb.org

Sponsoring

The ESMRMB School of MRI is kindly sponsored by

SIEMENS Healthineers

Advanced MR Imaging of the Musculoskeletal System

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May 18–19, 2017
St. Petersburg/RU

Course organiser:
Prudencia Tyrrell
Oswestry/UK

Local organiser:
Alla Karpenko, St. Petersburg/RU

Course venue:
Sokos Hotel Olympia Garden
Bataiskii Pereulok 3 A
190013 St. Petersburg
Russia

Preliminary faculty:
A. Karpenko, I. Nöbauer-Huhmann, N. Mamisch-Saupe, V. Pullicino, S. Trattnig, P. Tyrrell, A. Uchevatkin, F. Vanhoenacker

Course duration:
Thursday morning – Friday evening

The aim of this course:
MR imaging of the Musculo-Skeletal System including the spine, is one of the most common requests in routine clinical work. MRI is more sensitive than x-rays and CT in a wide variety of pathologies including tumour detection, degeneration, inflammation and trauma. However, specificity is often low and requires knowledge of specific sequence protocols, morphologic signs and pattern recognition.
In this course in St. Petersburg, as with all ESMRMB courses, it will be in the English language. There will be simultaneous translation of the lectures into the Russian language. The repetitions/small group tutorials/workshops will be performed in English with translator assistance. Eight topics will be addressed and will include bone marrow, spine, bone tumours, the shoulder, the hip, cartilage, sports injuries of the lower limb and MRI of musculo-skeletal trauma in the child and adolescent. Within each area 3-4 common or complex subjects will be addressed, reviewing the anatomy, typical and atypical imaging presentations and differential diagnoses. The course is a combination of lectures and case based repetitions in small groups.
We look forward to welcoming you at this international course which is delivered by renowned speakers.

Participation requirements:
Physicians and technician/radiographers who have a good knowledge of MR techniques; minimum of 6 months experience in applied MRI of the musculoskeletal system.

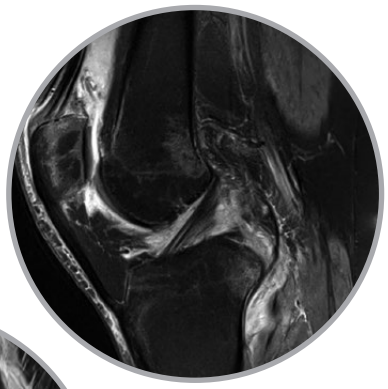
Learning Objectives

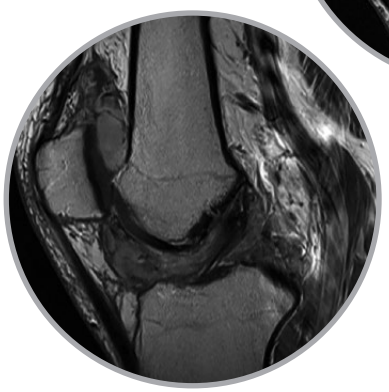
MRI of Cartilage
- Ultrastructural composition of articular cartilage
- How to image cartilage and cartilage repair tissue with basic and advanced MR imaging
- Cartilage lesions and how to describe them
- Cartilage repair tissue and how to classify it

MRI of MSK Trauma in the Child and Adolescent
- How I perform, read and report MRI of traumatic injuries of children and adolescent
- Bone and joint injuries in children of different age (including most common compartments of different joints)
- Growth plate injuries and their early and long term complications
- Role of MRI in differential diagnosis of traumatic and nontraumatic changes in growing skeleton

MRI of Sports Injuries of the Lower Limb
- Anatomy and pathology of the myotendinous unit
- Pelvic muscles and tendon injuries (including hamstring tendinopathy and athletic pubalgia)
- How I perform, read and report MRI of the ankle and foot
- Common ankle and foot injuries (ligament, tendon, bone)

MRI of Bone Tumours
- To define the role of MRI in characterization of bone tumours, in addition to age, location and other imaging
- To discuss the differentiation between benign and malignant bone tumours
- To learn how to use MRI for (local) staging, biopsy selection and therapy treatment





MRI of the Spine
- Disc degeneration and disc prolapse
- Spondylodiscitis
- Sero-negative spondyloarthropathy
- Sacrum and sacro-ileitis

MRI of Bone Marrow
- Introduction, normal BM and variants
- Diffuse BM replacement
- Focal BM replacement
- Therapy-related changes and WB-Imaging

MRI of the Hip
- How I perform, read and report MRI of the hip
- Labral anatomy and pathology
- Femoro-acetabular impingement
- Bone marrow oedema in the hip – transient osteoporosis, osteoarthritis or osteonecrosis (in part)

MRI of the Shoulder
- How I perform, read and report MRI of the shoulder
- Classification of impingement
- Rotator cuff lesions
- Shoulder instability and micro-instability

City Information: Saint Petersburg/Russia

Population:	approx. 5.2 million
Time zone:	CET +2
Currency:	Russian Ruble
Country dialling code:	+7
Closest airport:	Pulkovo Airport (LED / ULLI)

Saint Petersburg, besides being Russia's second-largest city after Moscow, is also the most westernized city of the country with an important Russian port on the Baltic Sea. Being one of the world's most beautiful cities, Saint Petersburg has all intriguing aspects one could ask for: high art, opulent architecture, wild nightlife, an extraordinary history and rich cultural traditions that have inspired and nurtured some of the modern world's greatest literature, music, and visual art. From the mysterious twilight of the White Nights to astonishing opera and ballet productions, Saint Petersburg has plenty to offer. The city is also the country's cultural heart. It is home to The Hermitage, one of the largest art museums in the world, including the superb collection of impressionist and post-impressionist art, as well as the incomparably ornate state rooms of the Winter Palace. The historic centre of Saint Petersburg, together with related groups of monuments, constitutes a UNESCO World Heritage Site.

Transportation:
Pulkovo Airport is located 14 km south of St. Petersburg and is well served by buses and Minivan Taxis. Express city buses run every 25-30 minutes and city buses every 12-20 minutes. You can also take a taxi from the airport to the city. Pulkovo Airport offers Taxi Pulkovo, a distinct fully licensed service. In general, official taxis have their reception desks at the airport, whereas illegal taxi drivers usually suggest their services in the airport hall. Please do not use an illegal taxi.
For further information please visit:
www.pulkovoairport.ru/en/transport

Hotel Information: www.esmrmb.org

Advanced Cardiac MR Imaging

Become a member and benefit from reduced registration fees

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May 18–20, 2017
Basel/CH

Course organiser:
Jens Bremerich
Basel/CH

Local organisers:
Jens Bremerich, Basel/CH
Claudia Miescher, Basel/CH

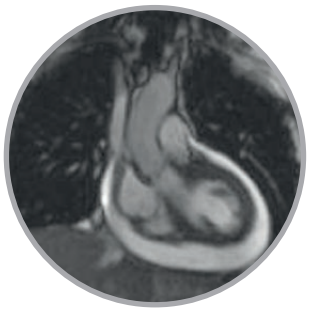
Course venue:
University Hospital Basel
Petersgraben 4
4031 Basel
Switzerland

Preliminary faculty:
J. Bremerich, P. Buser, M. Carlsson, M. Gutberlet, M. Hrabak-Paar, P. Hunold, A. Jacquier, L. Natale, A. Redheuil, F. Santini

Course duration:
Thursday morning – Saturday noon

The aim of this course:
MRI has evolved to a valid and robust clinical tool in everyday practice. The unique feature of tissue characterisation by means of T1-/T2-/T2*-/ECV-mapping together with cardiac morphology, function and flow with excellent spatial, temporal and contrast resolution explain its outstanding role in imaging cardiac disease. Multiple sequence options require stringent tayloring of imaging protocols and knowledge of both, pathology and modality. Beginners and advanced course participants learn basic principles of cardiac MR and discuss dedicated protocols based on real cases. Clinical topics provide deep insight into congenital, valvular, ischemic, inflammatory, and pericardial disease as well as storage disorders, masses and cardiomyopathy. Participants discuss these disorders with respect to relevant clinical questions. Strengths and limitations of MR and CT are highlighted. The focus of this course is MR, but CT and its role for coronary imaging and cardiovascular risk assessment are also addressed.

Participation requirements:
Physicians who have a good knowledge in MR techniques and a minimum of 6 months experience in applied Cardiac MRI.



Learning Objectives

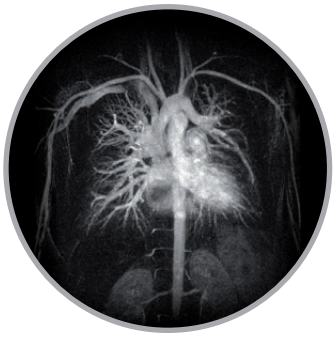
Tissue Characterisation, Fibrosis, Amyloidosis
- T1-/T2-/T2*-/ECV-mapping, Late Gadolinium Enhancement
- Sarcoidosis
- Amyloidosis
- Hemosiderosis, Thalassemia
- Myocarditis

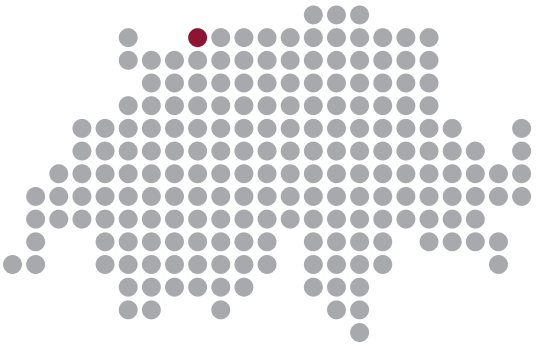
Heart Failure
- Definition
- Pathophysiology
- Clinical presentation
- Treatment options

Protocols Step-by-Step: Safety, Set-up for Stress
- Set-up for stress test
- Safety considerations
- Dedicated protocols
- Cooperation Radiology/Cardiology/Physics

Basic Principles of Cardiac MRI
- Spin-echo, Gradient-echo
- Triggering, gating
- Resolution of time, space, contrast
- Coronaries
- Contrast modulation by preparation pulses

Cardiac CT
- Basic principles
- Coronaries
- Calcium Score
- Valves
- Postprocessing





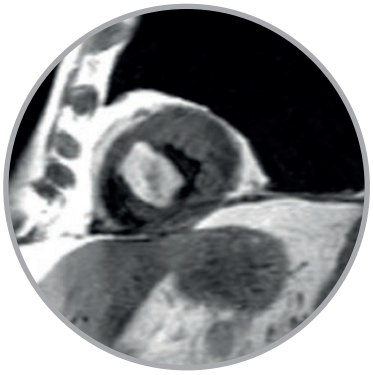
Congenital Heart Disease
- Segmental analysis
- Grown up congenital heart disease
- MR or CT
- Regurgitation, Insufficiency

Valvular Heart Disease
- Regurgitation
- Insufficiency
- Flow

Cardiomyopathy
- Pathophysiology
- ARVC
- Dilated cardiomyopathy and Non compaction
- Hypertrophic cardiomyopathy

Ischemic Heart Disease:
Infarct, Viability, Perfusion, Stress
- Function
- Perfusion
- Infarct, Viability, Late enhancement

Cardiac Masses, Pericardial Disease
- Systematic approach
- Benign and malignant tumours, metastasis, thrombus
- Acute vs. chronic pericarditis



City Information: Basel/Switzerland

Population:	approx. 175.000
Time zone:	CET
Currency:	Swiss Franc
Country dialling code:	+41
Closest airport:	EuroAirport Basel-Mulhouse-Freiburg (EAP / LFSB)

Lying at the heart of the three-country-triangle that joins Germany, France and Switzerland, **Basel** strikes you with its openness, cultural diversity, and economic strength. The Rhine flows right through the city, splitting it into Gross- and Kleinbasel ("Greater" and "Lesser" Basel). Hence, the river is a favourite meeting place as well as the city's major landmark. Packed into a small amount of space, there are treasures to discover from antiquity to modern times. Basel's nickname is also the "cultural capital of Switzerland". The city's almost forty museums display visual arts from antiquity to the present. The prestigious exhibitions hosted by Fondation Beyeler, Kunstmuseum (Museum of Fine Art) and Antikenmuseum (Museum of Ancient Art) draw international attention. Furthermore, Theater Basel captivates the imagination with drama, opera and ballet. It is in fact the largest theatre in Switzerland that features all three genres. Hence, the city lives and breathes culture, and promotes and celebrates the arts.

Transportation:
Just ten minutes' drive from the city centre and well served by buses, the EuroAirport boasts more than 90 direct flights within Europe, North Africa, Canada and Russia. All other destinations can be reached via intercontinental hubs or nearby Zurich airport. Buses from Basel Airport run to the SBB main train station in the city centre via Line 50. The journey takes around 20 minutes from the airport to Kannenfeldplatz and Basel main train station. The buses are operated by BVB and their timetable can be consulted at www.bvb.ch. Buses leave from the Swiss/German sector of the terminal building. Services for buses from the airport start at 4.50 am every day of the week, running at roughly 10-minute intervals from 5.30 am onwards until 11.50 pm at night. Tickets cost EUR 4,40. There is also a tram line (no. 2) which connects Basel's train station Badischer Bahnhof to the airport. From Badischer Bahnhof passengers will also be able to get a tram connection to the central SBB train station in Basel.

Hotel Information: www.esmrmb.org

Clinical fMRI & DTI – Theory and Practice

Become a member and benefit from reduced registration fees

June 15–17, 2017
Porto/PT

Course organiser:
Alexander Leemans
Utrecht/NL

Local organiser:
Antonio Bastos Leite, Porto/PT

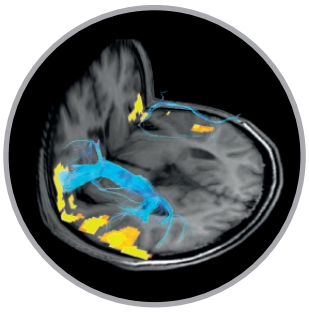
Course venue:
CINTESIS FMUP
Center for Health Technology and Services Research
Piso 2, edifício nascente
Rua Dr. Plácido da Costa, s/n
4200-450 Porto
Portugal

Preliminary faculty:
A. Bastos-Leite, V. Giampietro, D. Jones, A. Leemans, S. Lehéricy, R. Peeters, S. Rombouts, M. Smits, S. Wastling, S. Williams

Course duration:
Thursday morning – Saturday noon

The aim of this course:
The aim of this course is to convey in-depth knowledge about functional MR imaging (fMRI) and diffusion tensor imaging (DTI), with a focus on clinical practice. These advanced MR neuroimaging techniques are increasingly applied to the study of the healthy and diseased human brain and provide information about the brain's activity and its connections. The course will offer an overview of present methodologies, an update about functional anatomy and an overview of clinical as well as some research applications. These topics are taught using a mixture of lectures and small group exercises. In addition, a practical session on a 3T MR system performing fMRI studies in healthy volunteers complements the taught elements of the course. Finally, special attention is given to the (clinical) interpretation of specific cases, including results from both routine presurgical fMRI examinations and more advanced fMRI (group) studies. We are happy to welcome you to this course in Porto!

Participation requirements:
Physicians and technicians/radiographers with good knowledge of MR techniques; minimum of 3 months' experience in applied MR imaging and/or fMRI or DTI.



Learning Objectives

Basics of fMRI
- Physiological principles of fMRI
- Blood oxygen level dependent contrast (BOLD) MR technique and imaging sequences
- Resting state fMRI

Basics of DTI
- Physiological principles of anisotropic diffusion
- DTI technique and imaging sequences
- Concepts of quantification of white matter integrity
- Concepts of fibre tractography

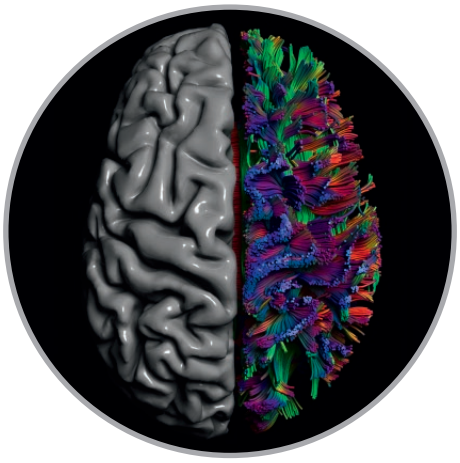
Experimental and Paradigm Design
- Technical set-up for fMRI
- Categorical, factorial, parametric designs
- Blocked versus event-related paradigms
- Paradigms: development, implementation and pitfalls

Data Analysis
- Spatial preprocessing
- Statistical analysis
- Fibre tractography

Functional Anatomy
- Motor system
- Language system
- Visual system
- Auditory system
- Applications and (clinical) interpretation

Presurgical fMRI/DTI
- Risk estimation in brain tumour patients
- Combining fMRI and DTI in brain tumour patients
- Challenges and pitfalls

fMRI/DTI in Psychiatry
- Applications in psychiatric disease
- Pharmacological fMRI
- Pitfalls



City Information: Porto/Portugal

Population:	approx. 220.000
Time zone:	CET -1
Currency:	Euro
Country dialling code:	+351
Closest airport:	Francisco Sá Carneiro Airport Oporto (OPO / LPPR)

The Latin name of **Porto**, Portus Cale, is the origin of the country's name Portugal. Porto is the second largest city of Portugal and is located in the estuary of the Douro River, in northern Portugal. Historic references to the city go back to the 4th century and to Roman time. In the Roman period the city developed its relevance as a commercial port, primarily in the trade between today's Lisbon and Braga. One of Portugal's most internationally famous products, Port wine, is named after the city because it is bottled in Porto and shipped from the area. Furthermore, the famous writer J.K. Rowling started to draft her story about Harry Potter during her stay in Porto, where she worked as an English teacher. Porto offers a wide range of cultural activities such as theatre, concerts, exhibitions, etc., as well as a bustling nightlife and a historic downtown, with many famous and beautiful sights. Porto's downtown itself is remarkably romantic in its narrow streets and the cascade of houses perched on top of one another, and can be admired from across the Douro River, where the Port wine cellars, themselves worth a visit, are located.

Transportation:
Porto airport is located approximately 11 km northwest of the city. The metro Line E connects the airport to the city centre. The journey takes about 30 minutes and costs approximately EUR 2,50. Furthermore, there are regular bus connections to the city centre. Porto offers a wide range of public transportation, such as railway, subway, buses and trams. Porto's main railway station is located in Campanhã, in the eastern part of the city. From here, trains go to the city centre. The central railway station ('São Bento Station') is situated in the city centre of Porto.

Hotel Information: www.esmrmb.org

Advanced Neuro Imaging: Diffusion, Perfusion, Spectroscopy

August 31 – September 2, 2017
Geneva/CH

Course organiser:
Johan Wikström
Uppsala/SE

Local organiser:
Sven Haller, Commugny/CH

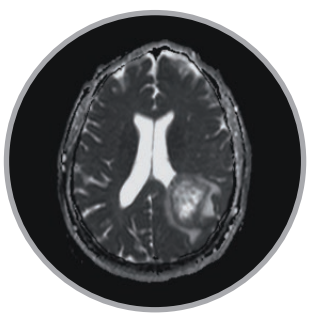
Course venue:
Campus Biotech
Chemin des Mines 9
1202 Geneva
Switzerland

Preliminary faculty:
A. Bjornerud, S. Brockstedt, E.R. Danielsen, S. Haller, L. Knutsson, M. Koch, R. Kreis, E.M. Larsson, J. Wikström, P. Due-Tönnesen

Course duration:
Thursday morning – Saturday noon

The aim of this course:
The aim of this course is to convey in-depth knowledge about advanced functional MR techniques for imaging of the central nervous system. The combination of MR physics (at a level for radiologists) and clinical applications in this course provides an excellent opportunity to improve the understanding as well as the clinical interpretation of diffusion- and perfusion-MRI and MR spectroscopy. During the last decade, these techniques have matured and are now frequently incorporated into daily clinical work. Furthermore, significant progress in the development of refined techniques, such as diffusion tensor imaging, has been made during the last few years. The course will offer an overview of present methodology with clinical applications in neuroradiology, as well as promising new methods, using a mixture of lectures and small group exercises. We are happy to welcome you to this course in Geneva where European experts in the field will share their knowledge with you.

Participation requirements:
Radiologists, neuroradiologists, physicians, physicists, radiographers, MRI nurses and others who have good knowledge in MR techniques; minimum of 6 months experience in applied MRI and/or Neuro Imaging.



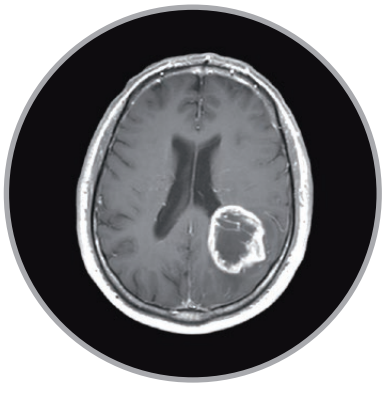
Learning Objectives

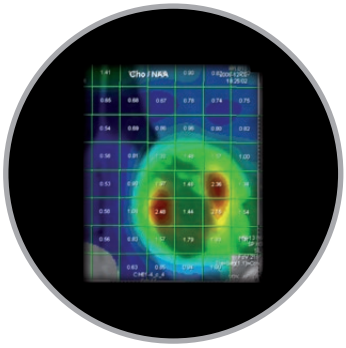
Diffusion (dMRI: DWI and DTI)
- Basic mechanisms
- Isotropic diffusion
- Anisotropic diffusion
- The ADC concept
- Pulse sequences and acquisition techniques
- Diffusion tensor imaging
- Diffusion kurtosis imaging
- Introduction to axonal fibre tracking and q-space imaging
- Pitfalls, practical issues, implementation

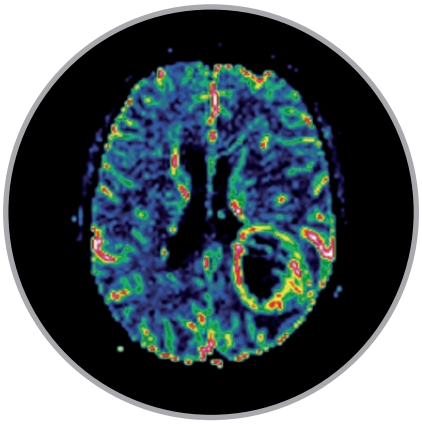
Perfusion (pMRI or PWI)
- Basic Physiology
- Dynamic Susceptibility Contrast (DSC) methods
- Pulse sequences
- Modelling, implementation and pitfalls
- Convolution and deconvolution
- Advanced modelling, heterogeneity, leakage correction
- Arterial spin labelling (ASL)

Clinical Applications of dMRI and pMRI
- Stroke
- Epilepsy
- Brain tumours
- Infection/inflammation
- Dementia
- Trauma
- Metabolic diseases

MR Spectroscopy (MRS)
- Basic principles
- Sequences for proton spectroscopy
- Postprocessing
- Metabolite quantification
- Quality Control and artefacts
- Clinical aspects
- Interpretation
- Pitfalls
- Applications







City Information: Geneva/Switzerland

Population:	approx. 201.000
Time zone:	CET
Currency:	Swiss Franc
Country dialling code:	+41
Closest airport:	Geneva International Airport (GVA / LSGG)

Geneva is the most populous city of Romandy, the French-speaking part of Switzerland, and the capital of the Canton of Geneva. Situated where the Rhône exits Lake Geneva, it is a global city, a financial centre, and a worldwide focal point for diplomacy as it hosts the highest number of international organizations in the world; among them the European headquarters of UNO. In addition, a dynamic, international city like Geneva devotes a large part of its budget also to cultural affairs. Geneva's ancient Old Town offers a living glimpse of the past while Geneva's more than thirty museums and art galleries capture the rich and vibrant history of the city including the International Red Cross and Red Crescent Museum and the Museum of Modern and Contemporary Art (MAMCO). For a change of pace take a cruise on the lake or relax in one of Geneva's main waterfront parks.
Geneva's most famous monument, Jet d'Eau, is the world's tallest water fountain and provides a constant landmark for exploring the city. Moreover, be sure to check out Geneva's famed Market Street to buy a Swiss watch or just window shop. Whatever your interest, Geneva has a wide range of hotel options to accommodate your stay offering renowned service and easy access to the city's major sites.

Transportation:
Geneva International Airport is situated just 4 km from the city center and well served by public transport. The train from the airport to the city center takes only 6 minutes and runs at 12-minute intervals. The airport train station can be reached directly from the arrival and departure levels. All trains stop at Geneva's main station 'Genf-Cornavin'. Passengers can pick up a free ticket for public transportation from the machine in the baggage collection area at the Arrival level. This Unireso ticket, offered by Geneva Airport, allows you to use public transport in Geneva free for a period of 80 minutes. A taxi ride to the city center ranges from CHF 35,- to CHF 45,-.

Hotel Information: www.esmrmb.org

Advanced MR Imaging in Paediatric Radiology

16

September 7–9, 2017
Lille/FR

Course organiser:
Fred Avni
Lille/FR

Local organiser:
Fred Avni, Lille/FR

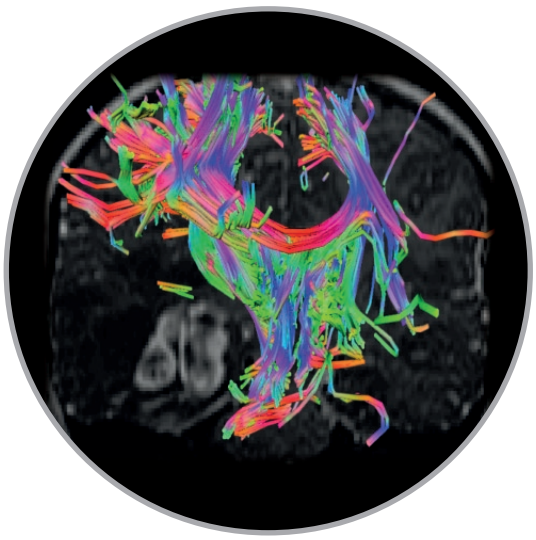
Course venue:
Faculté de Médecine Henri Warembourg
Pôle Formation
59045 Lille-Cedex
France

Preliminary faculty:
S.F. Franchi-Abella, F. Avni, P. Humphries, J. Lefaivre, O. Olsen, L.-S. Ording Muller, M. Panuel, P. Petit, A. Smets, E. Vazquez Mendez

Course duration:
Thursday morning – Saturday noon

The aim of this course:
With this course, we intend to familiarise the attendees with MR Imaging in children so that the indications would be better understood and the examinations optimised. The ten topics that have been chosen cover most of nowadays indications. Experienced lecturers have been chosen according to their technical and pedagogic skills.

Participation requirements:
Physicians and technicians/radiographers who have good knowledge of MR techniques; minimum of 6 months experience in Paediatric Radiology.



Learning Objectives

Paediatric MRI - Physics and Technique
- To identify the main physical principles underpinning practical clinical MRI in children
- To discuss the usefulness of specific sequences, weightings and imaging planes in body imaging

MRI of the Digestive Tract
- To illustrate basic and advanced MRI applications in the pediatric abdomen focusing on MRI-enterography
- To discuss indications and pitfalls
- To describe the potential and use of specific sequences in the bowel and abdomen

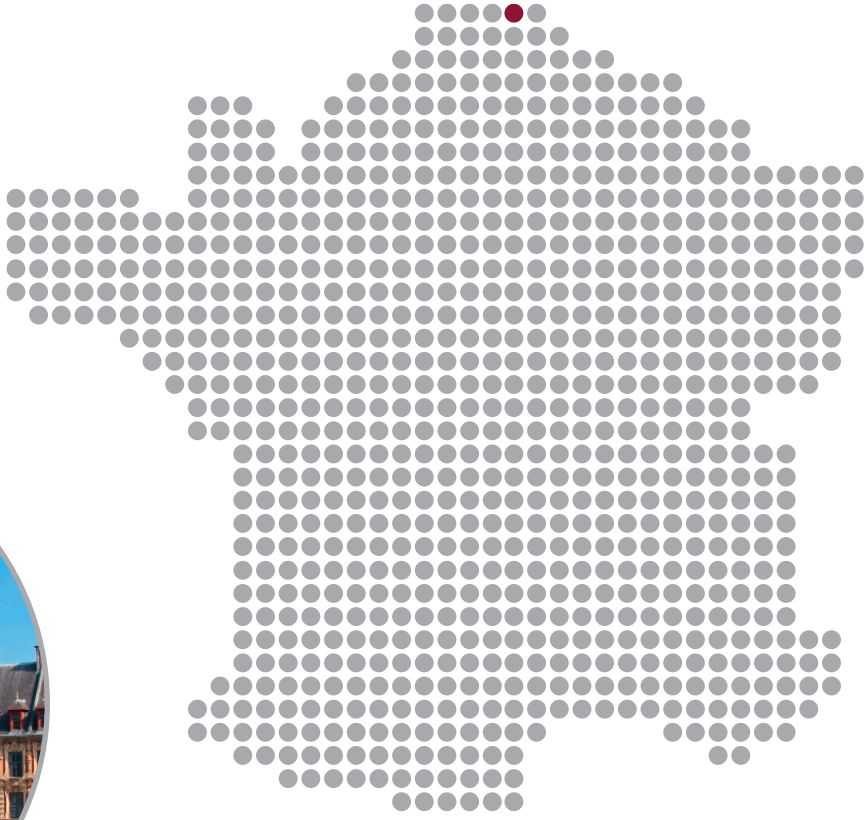
MRI of the Urogenital System
- To discuss appropriate sequences and techniques for urological and genital imaging
- To discuss where MRI can add value in urogenital imaging
- To highlight difficult areas and pitfalls

Fetal MRI
- To revisit what we need to know from fetal development, anatomy and physiology
- To discuss the best indications and sequences of fetal MR imaging
- To illustrate anomalies affecting the fetal brain, chest and abdomen

Oncology MRI and Full Body Applications
- To describe the advantages and disadvantages of MRI compared to CT for oncology imaging
- To discuss the role of MRI in paediatric tumour staging and response assessment
- To discuss the concept of whole body MR imaging in paediatrics

Hepatobiliary MRI
- To illustrate MR applications in the paediatric liver, including biliary tract evaluation and liver tumour imaging
- To address specific technical challenges for liver and biliary imaging in neonates and infants
- To address limitations of MR and the role of other imaging for hepatobiliary diseases

Neuro MRI 1
(Tumours, Differential Diagnoses and Techniques)
- To describe the role of advanced MRI in assessing pediatric tumors of the brain and the spinal cord in children
- To illustrate the most specific MRI findings in each particular tumor and its main differential diagnosis
- To review the role of these advanced MRI techniques in monitoring treatment response and prognosis



Neuro MRI 2
(Neonatal Imaging and Congenital Anomalies)

- To learn the increasing role of MRI as an essential tool either in the acute setting of term neonates with hypoxic-ischemic encephalopathy and similar conditions, as well as in the research field, for prognosis of neurodevelopmental outcome in preterm neonates.
- To illustrate the technical advances in spectroscopy, diffusion tensor imaging, perfusion imaging, functional MR imaging, as well as the use of higher magnetic field strengths that make MRI an invaluable tool for deeper evaluation of the developing brain.
- To review some logistic challenges and safety concerns specifically related to neonatal MRI (higher magnetic field, transporting, monitoring considerations, etc.)

MSK 1
(Infection/Inflammation)

- To describe relevant techniques and sequences for the assessment of infectious and inflammatory disorders of the musculoskeletal system
- To discuss the current state of the art in imaging juvenile inflammatory disorders, including potential pitfalls
- To describe the added value in MR imaging compared to conventional imaging for the assessment of infectious musculoskeletal pathologies

MSK 2
(MRI in Skeletal Trauma and Look-Alikes in Children)

- To discuss the main indications of MR imaging in skeletal trauma
- To provide the audience with the clues for the differential diagnosis and diagnosis "not to miss"
- To discuss technical optimization of MRI in MSK

City Information: Lille/France

Population:	approx. 229.000
Time zone:	CET
Currency:	Euro
Country dialling code:	+33
Closest airport:	Lille-Lesquin Airport (LIL / LFQQ)

Lille is the capital of the Hauts-de France region in Northern France, lying on the border with the Flemish part of Belgium. Due to its location in the Flanders plain, Lille's Flemish influence can be seen not only in its architecture but also in the irrepressibly cheerful nature of its residents. Admire the distinctly Flemish-influenced façades as you stroll among the arcades and galleries and enjoy some *moules-frites* (mussels with fries), *gaufres* (waffles) and regional beers. Sights worth visiting include the "Palais des beaux Arts" (Fine Arts museum), which has the richest collection of any museum in France after the Louvre, and Euralille, a modern district comprising futurist architectures. Furthermore, all aspects of Lille are again reinforced by its exceptional location as it lies at the heart of Europe and so close to such capitals as Paris, Brussels, London or Amsterdam. There are only a few places in France with such an architectural and cultural diversity; thus, Lille constitutes an eclectic place, cherishing past but also present exchanges.

Transportation:
Lille Airport is located 7 km south-east of Lille. The airport is served by a shuttle bus that takes you to the city center in around 20 minutes. Buses from the airport to the city run from 5.30 am to 22.10 pm from Monday to Saturday, and from 11.30 am to 22.10 pm on Sundays. A taxi ride to the city center should take around 15 minutes and costs between EUR 25,- and EUR 30,- depending on the time of day.
Lille is also reachable by TGV and Eurostar trains from Brussels (30 minutes), Paris (60 minutes) and London (90 minutes).

Hotel Information: www.esmrmb.org

Advanced MR Imaging of the Abdomen

18

September 14–16, 2017
Palermo/IT

Course organiser:
Nicholas Gourtsoyiannis
Athens/GR

Local organiser:
Giuseppe Brancatelli, Palermo/IT

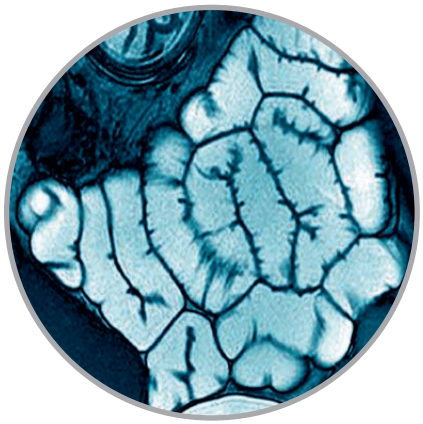
Course venue:
Sezione di Scienze Radiologiche
Policlinico Universitario
University of Palermo
Via del Vespro, 127
90127 Palermo
Italy

Preliminary faculty:
L. Blomqvist, G. Brancatelli, J. Futterer, N. Gourtsoyiannis, C. Matos, N. Papanikolaou, R. Pozzi-Mucelli, M. Ronot, A. Sahdev

Course duration:
Thursday morning – Saturday noon

The aim of this course:
The course aims to convey an in-depth knowledge about MR imaging of the abdomen. The topics covered include modern MRI techniques and updated MR applications for diagnosing focal and diffuse liver disease as well as recent developments in MR imaging of the pancreatic disorders and gynaecological disorders. The course also focuses on MR imaging of the GI tract, the kidneys, adrenal glands and prostate. A team of renowned teachers with expert knowledge in abdominal imaging ensures a high quality teaching programme and looks forward to welcoming you in Palermo.

Participation requirements:
Physicians who have good knowledge in MR techniques; minimum of 6 months experience in applied MRI of the Abdomen.



Learning Objectives

Diffusion-Weighted Imaging & MR Perfusion Studies: Clinical Applications in the Abdomen
- To be familiar with the principles of diffusion & perfusion MRI
- To be familiar with the technical aspects related to diffusion & perfusion MRI
- To be aware of the additional information these techniques provide in clinical practice

MR Imaging of Focal Lesions in the Non Cirrhotic Liver
- To know the frequent and rare focal liver lesions developed on non-cirrhotic liver
- To understand the role of MRI in diagnostic strategies
- To understand the concept of non-invasive characteriszation of lesion
- Role of in- and opposed phase imaging
- Role of diffusion-weighted sequences
- Role of hepatospecific contrast agents

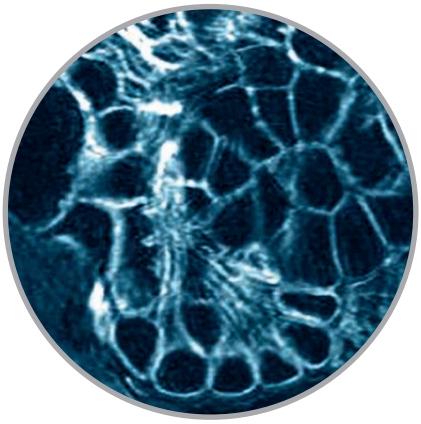
MR Imaging of Focal Lesions in the Cirrhotic Liver
- to be able to discuss the process of hepatocarcinogenesis
- to understand the vascular changes of nodules undergoing malignant transformation
- to present current knowledge to characterise nodules
- to recall the most frequent lesions occurring in the cirrhotic liver other than hepatocellular carcinoma

MR Imaging of Pancreatic Lesions
- Appearance of the normal pancreas and tumours on T1-weighted sequences
- Appearance of the normal pancreas and tumours on T2-weighted sequences with short TE
- Enhancement patterns of focal pancreatitis versus pancreatic tumours
- Staging of pancreatic tumours
- Contribution of diffusion-weighted imaging

MR Enteroclysis of the Small Bowel
- To discuss the advantages of volume challenge
- To describe the examination protocol in detail
- To explain the comparative merits of the multiple contrast mechanisms
- To present normal appearances
- To familiarise with MRE imaging findings
- To review crohn disease activity

MR Imaging of Kidneys and Adrenal Glands
- MRI appearance of the normal kidneys and adrenals
- The enhancement patterns of the renal and adrenal masses
- Characteristics of the renal tumours, including RCC, oncocytomas, angiomyolipomas etc.
- Staging of the RCC, including the diameter of the lesions, and extra-renal and vascular extension
- In- and opposed-phase imaging
- Benign and malignant adrenal tumours

Become a member and benefit from reduced registration fees



City Information: Palermo/Italy

Population:	approx. 676.000
Time zone:	CET
Currency:	Euro
Country dialling code:	+39
Closest airport:	Palermo Falcone Borsellino International Airport (PMO / LICJ)

Palermo, the cultural, economic and touristic capital of Sicily, is well-known for its art, history, architecture and gastronomy, playing an important role throughout much of its 2,700 years of existence. Since the history of Palermo dates back to the Prehistoric Age its sights range from historical and ancient museums to Medieval castles and churches. There is a lot to see in Palermo, such as the Modern Art gallery, the Catacombs of the Cappuccini, as well as Italy's largest indoor theatre, the Teatro Massimo. Also, it is the main seat of the UNESCO World Heritage Site of Arab-Norman Palermo and the Cathedral Churches of Cefalú and Monreale, located at the northern coast of Sicily. Layered with history as well as modern attractions, Palermo is a vibrant city that functions as both a living museum and a good starting point for exploring modern Italian culture. Developing, innovating and growing, you will find a city that is always on the move.

Transportation:
Palermo Airport is situated 35 km from the city centre. A taxi ride to the centre will cost you between EUR 35,- and EUR 45,-. There are also shared taxies, with a cost of EUR 7,- per person. They accommodate 7 people and leave the airport once the car pool is full of passengers. The most convenient way to travel to the city centre is by bus. Buses to and from the airport are operated by Prestia e Comandè and run every thirty minutes. Tickets cost EUR 6,30 for a single and EUR 11,- for a return fare. Bus tickets can be purchased on board of the bus or at the ticket office at the airport.

Hotel Information: www.esmrmb.org

MRI of the Prostate
- To learn about the multiparametric MRI of the prostate
- To understand the role of MRI in the detection of significant prostate cancer
- To know about image-guided biopsies of the prostate (MR- and MR/US-guided biopsies)
- To learn about MRI in the staging of prostate cancer

MR Imaging in Diagnosing and Staging of Ovarian Cancer
- To be able to describe radiological findings of OC
- To be able to differentiate the most common pathologies mimicking cancer
- To be able to describe tips and pitfalls in imaging
- To be able to stage ovarian cancer
- To identify findings associated with in-operability

MR Imaging of Rectal Cancer
- To understand the role of MRI for staging and restaging of rectal cancer
- To learn about the imaging features relevant for clinical decision making
- To understand potential pitfalls in interpretation

Advanced MR Imaging of the Musculoskeletal System

September 28–30, 2017
Lisbon/PT

Course organiser:
Prudencia Tyrrell
Oswestry/UK

Local organiser:
Vasco Mascarenhas, Lisbon/PT

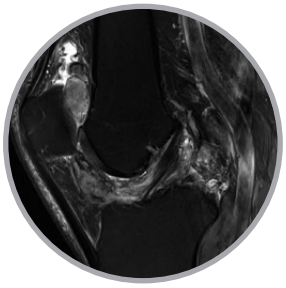
Course venue:
Hospital da Luz
Av. Lusíada 100
1500-650 Lisbon
Portugal

Preliminary faculty:
A. Baur-Melnyk, J. Gielen, C. Glaser, A. Karantanas, N. Mamisch-Saupe, E. McNally, V. Pullicino, N. Theumann, P. Tyrrell, K. Verstraete

Course duration:
Thursday morning – Saturday noon

The aim of this course:
MR imaging of the Musculo-Skeletal System including the spine, is one of the most common requests in routine clinical work. MRI is more sensitive than x-rays and CT in a wide variety of pathologies including tumour detection, degeneration, inflammation and trauma. However specificity is often low and requires knowledge of specific sequence protocols, morphologic signs and pattern recognition.
In this course in Lisbon, ten topics are addressed. These topics include bone marrow, spine, the shoulder, elbow, wrist and hand, the hip, knee, ankle and foot, bone tumours and sports injuries of the lower limb.
Within each area 3-4 common or complex subjects are addressed, reviewing the anatomy, typical and atypical imaging presentations and differential diagnoses. The course is a combination of lectures and case based repetitions in small groups.
We look forward to welcoming you at this international course which is delivered by renowned speakers.

Participation requirements:
Physicians and technician/radiographers who have a good knowledge of MR techniques; minimum of 6 months experience in applied MRI of the musculoskeletal system.



Learning Objectives

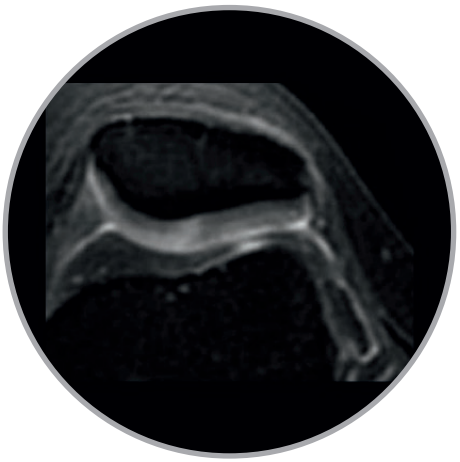
Bone and Soft-Tissue Tumours
- How to perform an MRI for bone tumours
- How to perform MRI for soft-tissue tumours
- Differential diagnosis of soft-tissue lesions
- Differential diagnosis of bone lesions
- Joint tumours and pseudotumoural lesions

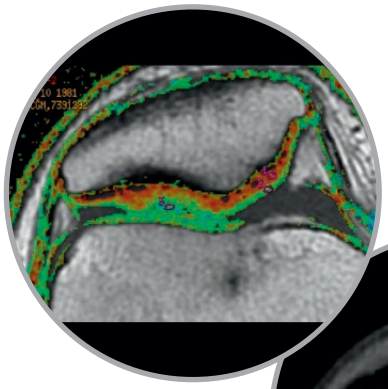
Hip/Pelvis
- How I perform, read and report a hip exam
- Labral anatomy and pathology
- Types of femoro-acetabular impingement (FAI)
- BME in the hip: Transient osteoporosis, osteoarthritis or osteonecrosis?

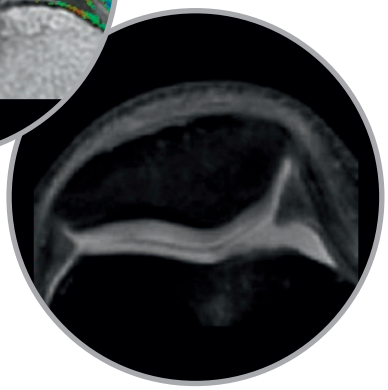
Bone Marrow
- Normal distribution of bone marrow and bone marrow variations
- Principles of focal and diffuse bone marrow replacement
- Benign versus malignant vertebral compression fractures
- Multiple myeloma/whole body Imaging

Knee
- Imaging strategies and sequence protocols
- Cruciate and collateral ligaments and menisci
- Osteochondral defects and osteonecrosis
- Bone marrow oedema

Sports Injuries
- Lesions of the muscle tendon unit
- Sports injuries of the pelvis
- Sports injuries of the lower limb







Shoulder
- How I perform, read and report a shoulder exam
- Classification of impingement
- Rotator cuff lesions
- Shoulder instability

Elbow
- How I perform, read and report an exam of the elbow
- Anatomic variants simulating disease
- Lesions in lateral/medial/anterior/posterior pain

Hand and Wrist
- How I perform, read and report an exam of the wrist
- TFCC lesions
- Carpal instability
- Tumours of the hand and wrist

Spine
- Disc degeneration and disc prolapse
- Spondylodiscitis
- Sero-negative spondylarthropathies
- Sacrum and sacroilitis

Foot/Ankle
- How I perform, read and report a foot exam (including ligaments and tendons)
- Normal variants and variants sometimes associated with disease
- Bone marrow oedema - transient osteoporosis – osteonecrosis – mechanical stress reaction
- Nerve entrapments including Morton´s neuroma and its differential

City Information: Lisbon/Portugal

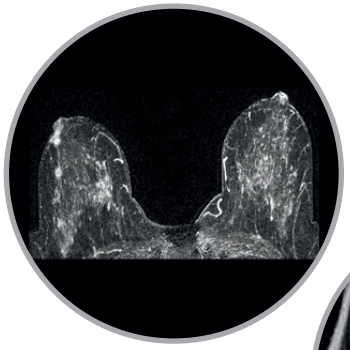
Population:	approx. 600.000
Time zone:	CET -1
Currency:	Euro
Country dialling code:	+351
Closest airport:	Lisbon Humberto Delgado (LIS / LPPT)

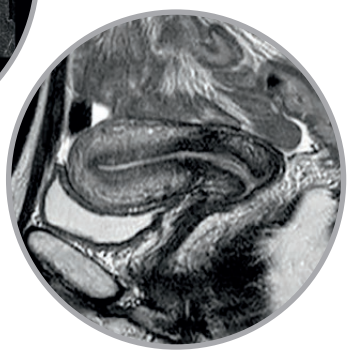
Lisbon is a historical capital city with 800 years of cultural influences that mingle with modern trends and lifestyles creating intricate and spectacular contrasts, which are spread across its seven hills, providing a view over the majestic Tagus River. Lisbon is the only European capital with sandy beaches, which are within 20 minutes from the cobbled streets of Lisbon's city centre. There are also the luxuriant hills of nearby Sintra, an oasis of lush parks dotted with fairy-tale palaces, and Estoril, a cosmopolitan resort with Victorian-era charm. Other famous sights worth visiting include São Jorge Castle, Tower of Belem, Monastery of Jerónimos, Avenida da Liberdade, Sé Cathedral and Alfama Borough.

Transportation:
Lisbon's Humberto Delgado Airport is located within the city limits. Every day there is a special service named 'Aerobus'. This line connects the Airport to the city centre. It is a service with a special fare (only tickets sold on-board by the driver are valid) and runs every 20 minutes. The 'Linha vermelha' of the metro system also gets you to the city centre. Within the city, the major public transport companies – Carris and Metro – serve the entire city with regular buses, trams and subway services. Apart from these transport companies, there are more than 3.500 taxis operating in Lisbon.

Hotel Information: www.esmrmb.org

Advanced Breast & Female Pelvis MR Imaging





September 28–30, 2017
Krakow/PL

Course organiser:
Riccardo Manfredi
Rome/IT

Local organisers:
Andrzej Frycz Modrzewski, Krakow University
Agata Bień-Krawiec, Krakow/PL

Course venue:
Krakowska Akademia im. Andrzeja Frycza Modrzewskiego
Gustawa Herlinga-Grudzińskiego 1
30-705 Krakow
Poland

Preliminary faculty:
B. Hamm, K. Kinkel, R. Kubik, F. Maccioni, R. Manfredi, V. Martinez de Vega, S. Mehrabi, T. Metens, M. Müller-Schimpfle, A. Rockall

Course duration:
Thursday morning – Saturday noon

The aim of this course:
Technical advances have opened up new diagnostic applications in female MR imaging with MRI gaining an increasing role in this patient population also in a clinical routine setting.
This course will offer an overview of current MR imaging strategies for the diagnosis of breast and pelvic diseases including foetal imaging and pelvic floor MRI. Established as well as potential future indications will be reviewed compared to other imaging examinations. We will discuss hard- and software requirements of MR systems for optimal clinical use as well as the optimisation of imaging strategies and diagnostic advantages arising from the application of contrast agents.
The aim of the course is furthermore to convey in depth knowledge of morphological changes of the breast and pelvic female organs under pathological conditions.
We would like to welcome you to this course in Krakow, where European experts in the field of female MR imaging will be given the opportunity to share their knowledge with you in plenary lectures and reinforce the information in small group discussion.

Participation requirements:
Physicians who have good knowledge in MR techniques and some experience in applied MRI of the breast and female pelvis.

Learning Objectives

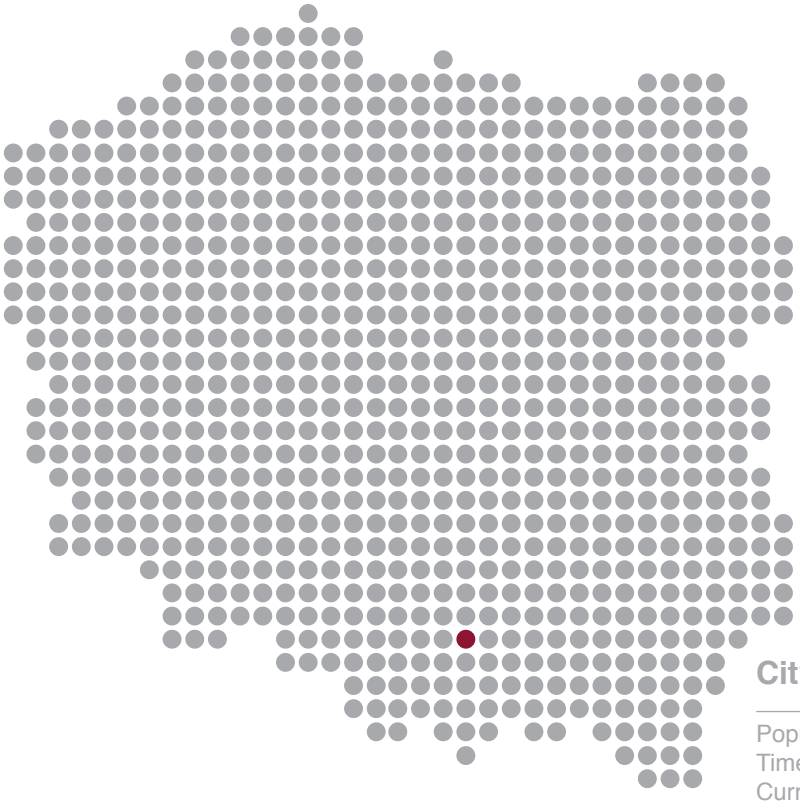
MR Imaging Techniques (Breast & Female Pelvis)
- Hard- and software requirements
- Basic pulse sequences for breast and pelvic MRI
- Advanced pulse sequences (including ultrafast sequences)
- Image post-processing
- Recent and future developments

Female Pelvis:
Protocol Optimisation, Benign Disease of the Uterus
- Optimised MR imaging strategy
- Normal MR appearance of the female pelvis according to age and menstrual cycle
- Muellerian duct abnormalities: Indication for MRI compared to HSG and US
- To diagnose and differentiate leiomyoma from adenomyosis
- Questions to be answered by MRI before and after leiomyoma embolization

MR Imaging of the Cervix and the Uterus:
Malignant Lesions
- Optimised MR imaging strategy
- MR appearance of malignant lesions of the cervix
- MR appearance of malignant lesions of the uterus
- Staging of malignancies
- Follow-up of malignant tumours

MR Imaging of the Ovaries
- Optimised MR imaging strategy including DWI
- Appearance of the normal ovaries on T1-, and T2-weighted images and the enhancement patterns
- Indications for MRI compared to US and CT for imaging in patients with adnexal masses
- Benign and malignant lesions
- Staging and follow-up of ovarian carcinoma

MR Imaging of the Pelvic Floor
- Hard- and software requirements
- Application of open magnet systems
- Optimised MR imaging strategy
- Anatomy of the pelvic floor
- Indications for MRI in the incontinent patient
- Ano-rectal diseases



City Information: Krakow/Poland

Population:	approx. 755.000
Time zone:	CET
Currency:	Polish Zloty
Country dialling code:	+48
Closest airports:	J. Paul II International Airport Krakow-Balice (KRK / EPKK) Katowice Airport (KTW / EPKT)

Krakow, Poland's ancient royal capital is one of the great survivors of this part of Europe. And much like the embattled old countess, who managed to come through the war and the Soviet era, it is a proud city having retained much of its splendour. It is the kind of place where each day you can stumble across something that you haven't noticed before – a little baroque church, a hidden courtyard, or perhaps just one of the myriad gargoyles and sculptures that peer down from the city's houses. Krakow's seven universities (the most famous is Jagiellonen University established in 1364), plus almost twenty other institutions of higher education, make it the country's leading centre of science and education. When in Krakow, you should really visit the Rynek Glówny (market), Kazimierz (the old Jewish district if Krakow), the Royal Castle, the cathedral and the salt-mines Wieliczka. The temperatures in Krakow can vary enormously, with temperatures of -20°C not uncommon in winter and 30°C during summer. Autumn can be surprisingly mild, with t-shirt weather lasting until October or even November (known as 'Golden Autumns').

Transportation:
One can easily get to the city by taxi, train, or bus. A taxi ride to the city centre takes around 30 minutes and costs approx. between PLN 70 and PLN 90. As the Krakow airport is situated just 15 km west from the city centre, the journey by train lasts under twenty minutes. Shuttle trains link the airport with the Krakow Glowny central station, located close to the historic district in the middle of the city. They run every 30 minutes and a one-way ticket costs PLN 8. Also, two bus services are available and the fare is an equivalent of roughly one euro. Line 292 runs to Krakow's central rail and bus stations every 20 minutes. A fair number of routes also land at nearby Katowice airport. The Matuszek Buses connect the city of Krakow with the Katowice airport. The Krakow's main railway station is within walking distance of the city centre. In the city centre, the network of trams and buses is cheap and efficient. Buy your tickets from any of the little kiosks that are dotted around the town.

Hotel Information: www.esmrmb.org

MRI in the Obstetric Patient/Fetal MRI
- Safety considerations
- Contrast agents in the pregnant and nursing patient
- Optimised MR imaging strategy, including ultrafast sequences
- Indications for MRI in the obstetric population
- MRI of the healthy foetus and the utero-placental unit
- Morphological changes in foetal malformation and pathology

Technical Aspects of Breast MRI
- Hard- and software requirements
- Currently used 2D and 3D techniques
- Post-processing of the source images
- Importance of temporal and spatial resolution
- New sequences: Diffusion-weighted image (DWI) and spectroscopy of the breast

MR Imaging of the Breast
- Breast imaging protocol
- BIRADS-classification for breast MRI
- Indications of breast
- Pitfalls & limitations
- Interventional techniques in breast MRI
- Breast MRI following breast surgery
- Breast implants and implant failure

MRI of the Breast: Screening the High Risk Population
- Pros and Cons of breast cancer screening using MRI
- How to select women who benefit most?
- How and when to perform MRI?

MRI of Advanced Gynecologic Cancer: Lymph Node Staging, Peritoneal Dissemination, Metastases
- Imaging strategy
- Plain MRI
- Contrast-enhanced MRI
- Lymphatic spread in uterine tumours

MR Safety

October 5–7, 2017
Bolzano/IT

Course organiser:
Siegfried Trattnig
Vienna/AT

Local organiser:
Nadia Oberhofer, Bolzano/IT

Course venue:
Ospedale di Bolzano
Via Lorenz Böhler 5
39100 Bolzano
Italy

Preliminary faculty:
D. Beitzke, K. Bräuner, J. Felblinger, L. Hanson, A. Jones, M. Krssak, A. Melzer, G. Schaefers, F. Schick, H. Thomsen, S. Trattnig

Course duration:
Thursday morning – Saturday noon

This course is limited to 35 participants!

The aim of this course:
The aim of the course is to provide a systematic overview of the risks connected to superconductive clinical MR systems. It will cover both patient safety and personnel safety. The potential hazards related to the 3 different electromagnetic fields used in MR (the static magnetic field, the switched gradient field and RF field) will be presented and experienced in practical sessions. Another important aspect are the standards of MR Safety and compatibility testing in active as well as non-active implants, with a focus on a training in clinical strategies how to handle implant safety issues in the MR environment, enhance patients safety and improve the MR workflow in daily routine. Special aspects such as cardio-vascular implants and MR Safety issues in interventional MR will be presented, too. The most recent developments and risks of Gadodolinium-based MR contrast agents will be covered. Additionally, an introduction to risk management in clinical MR systems will be given. The course will provide a combination of lectures and practical training sessions in smaller groups.

Participation requirements:
The target group can be subdivided into the following two categories:
Health care personnel: radiologist, radiological technologist, physician, ongoing MR safety expert and Safety Officer, occupational physician
Other personnel: medical physicists, MR researcher, hospital safety manager, maintenance manager

Learning Objectives

Introduction to Construction and Function of MRI Scanner
- Update on MR scanner components
- Update on MR basics

A Systematic Overview on MR Interactions with Magnetic and Electrically Conductive Materials
- Characteristics of the static magnetic field inside and around a clinical MR system
- Forces and torques acting on magnetic materials in static magnetic fields
- Characteristics of the radiofrequency electromagnetic transmitter field and of the gradient field
- Induction of electrical currents by time varying electrical and magnetic RF fields in conductive structures and tissue

Risks in MRI I:
Static Bo Field, Dangers Due to Superconductors
- Value of the static magnetic field around the magnet
- Exposure limits for static magnetic fields
- Potential risks for human exposure to static magnetic fields
- Dependence of physiologic effects on relevant parameters of the static magnetic field
- Potential risks of superconducting magnets

Risks in MRI II:
MR Gradients and RF
- Exposure limits for low frequency gradient fields
- Potential risks for humans with gradient fields
- Exposure limits for high frequency RF fields
- Potential risks of high frequency RF fields
- Dependency of SAR from the static magnetic field

Implant Testing and Safety Considerations
- Active definitions of MR Safety and terms
- Standards of MR Safety and compatibility testing
- Presentation of standard test methods
- Simulation of RF heating using human models
- MR Labelling of active and non-active implants with respect to static magnetic and switched gradient magnetic fields and RF fields

MR-Safety Considerations in a Clinical Environment
- How to prepare the patient for the MR examination
- To learn about the impact of different implants on clinical MRI
- To understand the patient related MR safety issues without implants (burning incidents)
- To be aware of emergency situations in the scanner room

Implant Problems and Optimisation.
Researching Implants
- Impact of implants on clinical MRI and financial consequences
- Strategies of improvement, workflow
- Effective research of MRI-conditions of implants
- MR Conditionals pacemaker
- Fixed Parameter mode

Cardiovascular Implants and Cardiac Pacemarkers in MRI
- Risks and subsequent limitations of MR imaging after stents and stent graft implantation
- The risks of conventional,'old' cardiac pacemarker implantation
- Newest guidelines of MR safety after stent and pacemaker implantation

MR Safety Issue in Interventional MR
- Principles of Interventional MRI and intraoperative MRI
- Potential risks for clinicians and patients
- Technical requirements for safe Interventional MRI and intraoperative MRI
- Limitations of visualisation and tracking of interventional devices
- How to avoid reaching exposure limits during interventions
- Examples from clinical and pre-clinical studies

Contrast Agents
- Chemical caracteristics of Gd chelates
- Risks of Nephrogenic Systemic Fibrosis
- Evaluation of renal function
- Allergic reactions with Gd chelates
- New developments of Gd based contrast agents

EU Directive and MR Worker Training
- MRI in the context of European health and safety legislation
- Existing national and international EMF exposure guidelines and standards
- EC standard 60601-2-33
- The Physical Agents (EMF) Directive: state of play and possible future developments

Risk Management in MR
- Risk assessment
- Instruments for risk management (reporting, root cause analysis,…)
- Strategies for risk reduction in MR
- Considerations regarding ferromagnetic detectors and the commitment to a ferrous-free MR environment

Practical Session I
System-Related MR Safety
The goal is to give the participants a hands-on experience of the potentially dangerous interactions of metallic objects with the intense static magnetic field.

Practical Session II
Patient-Related MR Safety
This session is focused on safe patient handling in MR: how to avoid rf-burns and emergency situations including fire and quench.

Practical Session III
RF Heating
Participants will experience the RF heating issue with an experiment. The goal is to understand the parameter complexity related to SAR and to know the necessities for interpretation of the RF part of the MR labelling of devices/items.

City Information: Bolzano/Italy

Population:	approx. 106.000
Time zone:	CET
Currency:	Euro
Country dialing code:	+39
Closest airports:	Innsbruck/AT (INN)
	Verona-Villafranca/IT (VRN)
	Munich/DE (MUC)
	Bergamo-Orio al Serio (BGY)
	Milano-Malpensa/IT
	Milano-Linate/IT (LIN)

Bolzano is the capital city of South Tyrol; an autonomous province in the heart of the Italian Alps. Having belonged for centuries to the Austro-Hungarian-Empire it was incorporated to Italy 100 years ago. It now represents an important meeting point between the German- and Italian-speaking cultural and economic areas, characterized by bicultural daily life among the big urban centres in the alpine region. Thanks to its double perspective, Bolzano represents a perfect union, which can be clearly seen in the historic and artistic treasures of this city. Today, the capital of Südtirol/Alto Adige has become a cosmopolitan city that knows how to be lively, cheerful, modern and yet refined all at the same time! Also, the mountains surrounding Bolzano offer countless possibilities for hiking and many day-trips by public transport. Additionally, Bolzano is a true conference centre as it makes itself readily available for events and business affairs. Bolzano is a clear reflection of a place where different cultures meet and intercultural exchange takes place.

Transportation:
Bolzano is best reached by train. Regular train service is offered between Innsbruck, as well as Verona Porta Nuova train station, and Bolzano. Direct trains depart respectively every two hours, regional trains depart every hour. Tickets cost between EUR 12,- and 30,-. The nearest international airports are Innsbruck and Verona (both 2 hours away). Flights to Innsbruck and Verona are usually more expensive and require connecting flights. Other options are direct flights to Munich airport, or Milano-Malpensa, Milano-Linate, Bergamo, or Venice. There are also direct shuttle buses every 3 hours from Munich airport (EUR 55.-), Milano-Malpensa (EUR 78.-), Bergamo airport (EUR 58.-), and Verona airport (EUR 48.-).

Hotel Information: www.esmrmb.org

Body Diffusion-Weighted MR Imaging: Solving Clinical Problems and Diagnostic Dilemmas

Become a member and benefit from reduced registration fees

November 8–10, 2017
Brussels/BE

Course organiser:
Dow-Mu Koh
London/UK

Local organisers:
Maria Antonietta Bali, Brussels/BE
Pietro Scilla, Brussels/BE

Course venue:
Musée de la Medicine
Campus Erasme – Place Facultaire
Route de Lennik 808
1070 Anderlecht, Brussels
Belgium

Preliminary faculty:
M.A. Bali, H. Chandarana, D. Collins, F. De Keyzer, L. Fournier-Dujardin, N. Grenier, D.-M. Koh, C. Matos, A. Padhani, I. Thomassin-Naggara

Course duration:
Wednesday – Friday

The aim of this course:
Diffusion-weighted MR imaging is now widely used in the body to improve patient management. In this newly revised course, we will emphasize on the practical aspects of using diffusion-weighted MRI to solve common clinical problems and diagnostic dilemmas in the body. We will review both the basic and advanced theories of body diffusion-weighted MRI, as well as the implementation of imaging protocols at 1.5T and 3.0T, including whole body imaging. The growing use of diffusion-weighted MRI for evaluating disease heterogeneity will be discussed, as well as the complimentary role of the technique on a hybrid MR-PET imaging system.

Participation requirements:
Participants should be physicians or technicians/radiographers who have basic knowledge in MRI techniques and are experienced in MRI (6 months minimum).

Learning Objectives

DWI: Principles, Theory, Nomenclature and Beyond ADC
- Principles of DW-MRI
- Diffusion-weightings: b-values
- Monoexponential ADC quantification
- Non-monoexponential diffusion models: IVIM, Stretched exponential, diffusion kurtosis imaging
- Measurement repeatability of DWI quantification

Getting the Best Body DWI at 1.5T and 3.0T: A Practical Approach
- Imaging sequences for body imaging
- Technical implementation at 1.5T and 3.0T
- Pros and Cons of DWI at 1.5T and 3.0T
- Strategies to improve image signal-to-noise and reduce artefacts for DWI

Problem Solving in the Liver and Upper Abdomen
- Clinical protocols of DWI in the liver and upper abdomen
- Evaluation of focal lesions in the cirrhotic and non-cirrhotic liver
- Applications in the small bowel and colon
- The value of DWI for tumour detection, disease characterization and assessment of treatment response

What is the Role of DWI for Pancreatic and Biliary Diseases?
- Technical implementation of DWI for evaluating the pancreas and biliary tree
- Combining DWI with conventional MRI for disease detection and characterization
- Advanced DWI models for pancreatic diseases
- Assessing treatment response using DWI
- Diagnostic pitfalls

Renal Pathologies: The Added Value of DWI
- Clinical implementation of DWI in the kidneys and upper urinary tract
- Clinical applications of DWI for diffuse renal disease and assessment of renal function
- The application of DWI for the assessment of focal renal lesions
- Advanced DWI models for evaluating the kidneys

Improving the Assessment of the Uterus and Adnexal Masses
- Technical implementation for evaluating the female pelvis
- DWI evaluation of the uterus and adnexal masses
- Application of DWI for tumour detection, disease characterization and the assessment of treatment response
- Potential diagnostic pitfalls

Peritoneal Disease: Improving Detection and Patient Management

- Current limitations of peritoneal disease assessment using CT and PET imaging
- Impact of peritoneal disease in cancer management
- Role of DWI for detecting peritoneal disease, evaluation for debulking surgery and assessing treatment response in ovarian cancer
- Unmet challenges

Assessing and Directing Treatment of Bone Disease

- Current challenges of evaluating metastatic bone disease and diffuse marrow involvement
- Implementation of whole body DWI to assess marrow disease
- Image interpretation (including MET-RADS-P reporting system)
- Understanding bone marrow ADC and fat fraction quantification
- Avoidance of pitfalls

Tumour Heterogeneity in the Era of Targeted Treatments: What Can MRI and DWI Tell us?

- Understand tumour heterogeneity as a major challenge in oncology
- Techniques to describe inter-tumour and intra-tumour heterogeneity
- Applying MRI and DWI to demonstrate tumour heterogeneity linked to tumour biology
- The role of radiomics in assessing tumour heterogeneity

Advanced DWI Methods and Use with other Quantitative and Hybrid Imaging Technologies

- Understand the emerging use of advanced DWI methods in oncology
- The role of multiparametric MRI for the disease assessment (including prostate cancer as example)
- Combining DWI with hybrid Imaging (including PET-MRI) as potential one-stop-shop for cancer assessment

City Information: Brussels/Belgium

Population:	approx. 180.000
Time zone:	CET
Currency:	Euro
Country dialling code:	+32
Closest airport:	Brussels Airport (BRU)

The City of **Brussels**, *de jure* capital of Belgium, is the largest municipality of the Brussels-Capital Region covering most of the region's centre, as well as northern outskirts where it borders municipalities in Flanders. Brussels city consists of the central historic town and additional areas within the greater Brussels-Capital Region, namely Haren, Laeken and Neder-Over-Heembeek to the north, and Avenue Louise and the Bois de la Cambre to the south. Moreover, the city has a rich cultural offer in its cultural sites, theatres and museums. Moreover, important events of historic, folkloristic, and cultural value and lots of leisure activities attract a big variety of people.
Furthermore, as Brussels began to host institutions in 1957, the city has become the administrative centre of many international organisations. The European Union (EU) and the North Atlantic Treaty Organisation (NATO) have their main institutions in the city, along with many other international organisations and corporations. Due to its high number of international conferences Brussels hosts, it is also becoming one of the largest convention centres in the world. Consequently, the presence of all these organisations has contributed significantly to the importance of Brussels as an international centre.

Transportation:
Compared to most airports around the world, Brussels airport is only 12 km away from the city centre. Trains to all 3 main Brussels stations run from the airport station roughly 4 times an hour. The price for a single journey is EUR 8,60 and tickets can also be purchased online at www.belgianrail.be. Journey time into/from Brussels is about 20 minutes and trains start running from the airport at around 5.30 am until past midnight. There is also the possibility to take the Airport Line Bus 12 which operates between the airport and Place du Luxembourg. In addition, the De Lijn bus company also offers regular transfer services between Brussels Airport and Brussels city centre. Lines 272 and 471 can be used to reach Brussel-Nord station, taking about 45 minutes. Tickets cost EUR 4,50 from the ticket machines or EUR 6.- from the bus driver. There also taxis operating at the airport. Yet, it is recommended to use only official, metered taxis. The usual price from the airport to the city centre is between EUR 45.- and EUR 50.-. You can order an airport taxi at the Brussels airport webpage http://www.brusselsairport.be/en/. However, there is also the possibility to reach Brussels by train from many European cities. International high-speed trains such as Thalys, Eurostar, TGV and the German ICE stop at the main railway station Brussels South (Bruxelles-Midi/Brussel Zuid).

Hotel Information: www.esmrmb.org

Advanced Head & Neck MR Imaging

November 16–18, 2017
St. Julian's/MT

Course organiser:
Roberto Maroldi
Brescia/IT

Local organiser:
Edith Vassallo, Msida/MT

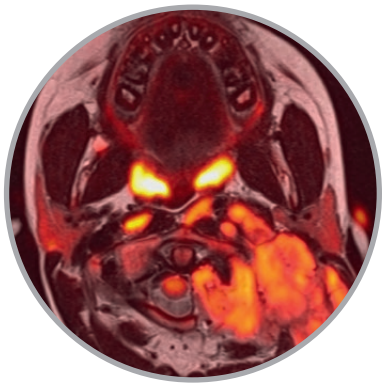
Course venue:
Marina Hotel Corinthia Beach Resort
St. George's Bay
St. Julian's STJ 3301
Malta

Preliminary faculty:
T. Beale, A. Borges, C. Czerny, F. de Keyzer, M. de Win, D. Farina, N. Freling, R. Maroldi, B. Schuknecht, A. Trojanowska, B. Verbist

Course duration:
Thursday morning – Saturday noon

The aim of this course:
The aim of this course is to offer an in-depth knowledge of current MR imaging techniques for the diagnosis of head and neck lesions. The course will provide the participant with an update on fundamental and advanced sequence protocols to image the different head and neck regions. A comprehensive coverage of the MR signal of the normal tissues will give the preliminary basis for head and neck anatomy. We will focus on imaging strategies, recent developments and specific MR findings to characterise head and neck congenital, inflammatory, benign and malignant diseases. Special emphasis will be placed on differential diagnosis and on grading tumour extent. The course will provide a combination of lectures and case based interactive teaching in small groups.

Participation requirements:
Physicians who have good knowledge in MR techniques; minimum of 6 months experience in applied Head and Neck MRI.



Learning Objectives

Basic and Advanced MR Imaging Techniques
- DW Imaging
- IVIM DW derived perfusion-fraction Imaging (D*)
- Which sequences on head and neck on 3T?
- 3T Isotropic and non-isotropic high-res imaging
- DCE-MR: Which use in the head and neck?
- Isotropic T1w and T2w imaging at 1.5T
- Imaging arteries and veins. Black blood, TOF, PC, CE-MR

DWI in the Head and Neck
- Which protocol for oncologic imaging?
- Critical issues in managing artefacts
- Low b, high b, ADC map: low ADC vs high ADC
- Applications in the Head and Neck: primary tumor & recurrences
- DWI and cholesteatoma

MR Imaging of the Oral Cavity and Oropharynx
- MR anatomy of the oral cavity and oropharynx
- MR examination of the cooperative & uncooperative patient
- The submucosal mass
- Patterns of growth of malignant neoplasms
- Key information and MR most frequent pitfalls

MR Imaging of the Sinonasal Tract and the Skull Base
- MR anatomy of the anterior skull base floor, orbit, pterygopalatine fossa, cavernous sinus and Meckel's cave
- MR examination of the sinonasal tract and anterior skull base
- Polypoid masses. Feasibility of endonasal surgery. Grading skull base invasion. MR in predicting orbit preservation

MR Imaging of the Nasopharynx and Parapharyngeal Space
- MR anatomy of the nasopharyngeal walls and parapharyngeal space
- How to study the nasopharynx and parapharyngeal space lesions
- Differential diagnosis of submucosal masses
- MR patterns of pre- and post-styloid masses
- Staging nasopharyngeal neoplasms

MR Imaging of the Oropharynx and Oral Cavity
- MR anatomy of key oral cavity structures
- MR strategies to image flaps and post-treatment changes
- Role of DCE-MR and DWI imaging
- Role of MR in detecting mandible invasion. Perineural spread and bone invasion

MR Imaging of Major and Minor Salivary Glands
- MR anatomy of key landmarks
- Fat sat sequences, DCE-MR and DWI imaging. MR Sialography
- Distinguishing parapharyngeal from parotid gland 'deep lobe' tumours

Island Information: Malta

Population:	approx. 500.000
Time zone:	CET
Currency:	Euro
Country dialling code:	+356
Closest airports:	Malta International Airport (MLA)

Malta is an island nation in the Mediterranean Sea just south of Sicily, Italy. The country of Malta is actually an archipelago, although only three of the largest islands are inhabited: Malta, Gozo, and Comino. Over the last decade, the island became a major freight shipping hub, financial centre, and tourist destination. In fact, if any country deserves the reputation of a being a melting pot of cultures, Malta certainly does, having been ruled by the Phoenicians, Greeks, Carthaginians, and Romans.

Saint Julian's (San Ġiljan) is a famous holiday resort on the coast of Malta. The little town encompasses the charm of a fishing village while also being a tourist centre. Maltese architecture highlights such as the Spinola Palace, built in 1688, and the Old Parish Church, are historic points of interest. Also, the lovingly restored quarter 'Paceville', a former military area of the 1930s, is now the heart of the nightlife of Saint Julian's due to its variety of restaurants, bars and clubs.

Further points of interest, such as Balluta bay and Sliema promenade, are located just within walking distance from St. Julian's. Also, for those interested in history and culture, the capital city Valletta and the beautiful old capital Mdina are definitely worth a visit.

Transportation:

The airport of Malta is only 10 km away from St. Julian's. Reaching the airport in Malta by bus is very straightforward thanks to four express lines designated X1, X2, X3 and X4, as well as other bus lines serving the airport. Also, it is possible to go by "Malta Transfer"; the aiport's official shuttle service. It offers convenient trips to and from your hotel in Malta or Gozo. You can manage your transfers with fixed prices through the booking system at www.maltatransfer.com. Alternatively, you can visit the booking desk at the airport and make your transfer arrangements on site.

In general, the cities on the island of Malta are well connected with several bus lines and the bus company offers an online journey planner via their website at www.publictransport.com.mt/. Taxi services between the airport and any destination in Malta are available 24 hours a day. Pre-paid tickets can be purchased at fixed rates from a booth in the Welcomers' Hall.

Hotel Information: www.esmrmb.org

Surface Coil MR Imaging of the Larynx and Hypopharynx

- How to image the larynx and hypopharynx: tips and tricks
- Which sequences? Which study planes?
- New insights on muscles and fat spaces: high-res anatomy
- How to recognise edema of fat, muscles and cartilage

MR Imaging of Lymph Nodes and Lumps in the Neck

- Imaging techniques to detect and characterise neck nodes. Which role for DWI?
- Retrolatero-pharyngeal and parotid nodes
- MR of cystic, vascular and solid masses in the neck
- The unknown primary. Is MR imaging useful?

MR Imaging Techniques and Assessment in the Follow up of Cancer

- The timing of MR follow up and the integration with Molecular Imaging
- How to tune an effective Imaging protocol in the treated patient
- Tissue changes due to therapy and the correspondant patterns on MR sequences
- MR follow up and the assessment of the feasibility of salvage therapy for recurrent tumor

MR Imaging of Temporal Bone and CPA Lesions

- MR anatomy of VII and VIII cranial nerves. The normal membranous labyrinth. Landmarks for the jugular foramen
- Imaging temporal bone and CPA lesions. 3D T2 sequences
- DWI imaging
- Inner ear malformations: is cochlear implant feasible? Neuro-vascular conflict. Detecting the recurrent cholesteatoma

MR Imaging of the Orbit

- MR anatomy and imaging techniques
- Extra-ocular vascular lesions: cavernous hemangioma, lymphatic malformations, varices, AV malformations
- Inflammatory pseudotumour, lymphoma and orbital metastasis
- Thyroid ophthalmopathy: MR Imaging

eLearning:
Basic Course on Applied MR Techniques

Course organiser:
Eva Scheurer
Basel/CH

Preliminary faculty:
F. Breuer, J. Felblinger,
B. Jung, J. Reichenbach, K. Scheffler

The aim of this course:
The course is aimed at those of you who have no or little physical and mathematical background, but would like to understand the process of image formation and the sequences of usual clinical MR imaging. The course consists of 7 modules of 60 minutes, which take place once a week, and a self-assessment test. Thus, the course extends over a period of 7 weeks. Each module consists of a presentation in form of a live lecture given by experienced teachers, and additionally offers direct interaction with the speaker with question/answer time at the end of each module. The presentations can be followed on any computer with internet access.
The course is particularly aimed at medical doctors (e.g. residents in radiology), biologists or technicians who work with MRI or have an interest in using MRI for research. Participants do not need previous experience in MR techniques and MR physics.

Goals of the course:
Attendance at the Basic Course on Applied MR Techniques will enable you to

- profoundly understand signal and contrast generation in MR images at different conditions (morphological, biophysical and technical);
- use the right measurement sequence for your clinical questions;
- optimise your MR examination (measurement protocol, sequence timing, etc.);
- verify image contrast by modifying measurement sequence or by applying contrast agents;
- interpret MR images back to tissue components and functional activities;
- understand advanced MRI techniques such as MR angiography, diffusion imaging, perfusion sequences etc.
- ensure safe application of MRI by knowing the involved hardware components and the safety risks

Course details:

- The course consists of 7 modules of 60-90 minutes each (time for questions included).
- The lecture material will be uploaded approx. 1-3 days prior to the respective module. Only watermarked and secured PDF documents will be available for participants. The webinar itself will not be provided on demand.
- It is recommendable to use a headset for the interactive part of the course, but you can also log-in by phone.
- A confirmation of attendance will be provided at the end of the course. Please be informed that you have to be present 70% (5 out of 7 modules) of the course in order to receive a confirmation of attendance. We would appreciate to receive a short notification in case you will not be able to attend one of the modules.
- The webinar will consist of a power point presentation shown via computer and a live talk of the speaker. After the 45-50-minute talk there will be a question/answer session.

Course dates:
Please visit www.esmrmb.org for a list of all 7 course module dates.

Learning Objectives

The Physical Basis of Nuclear Magnetic Resonance
- Magnetic field
- Spin and magnetic moment
- Spin precession and Larmor frequency
- Magnetic properties of nuclei
- Resonance
- FID
- Fourier transform
- Relaxation, T1 and T2

Magnetic Resonance Imaging: Formation of the Imaging
- Gradients
- Localization principles
- Slice selection and slice parameters
- Frequency encoding
- Notion of phase encoding

Basic Clinical Sequences, Tissue Contrast and Image Quality
- Image quality: contrast, spatial resolution and Signal-to-Noise Ratio
- Main artifacts
- Tissue parameters and pathological variations
- Spin echo sequence and parameters: TR, TE
- Proton density, T1- and T2-weighting
- Slice thickness, FOV, Matrix size
- Gradient echo techniques and steady state free precess (SSFP)
- Spoiling techniques and T1 contrast
- Contrast-enhanced-SSFP and T2* contrast
- Saturation pulses

Basic Methods of Contrast Enhancement
- Presaturation
- Water and Fat imaging and artifact
- Basic principles, classification and biodistribution of contrast agents
- Basic principles of MR angiography using contrast agen

MR Hardware and Safety Aspects
- Magnets and cryogeny
- Gradient coils
- Radiofrequency coils
- Computers
- Metal in a magnetic field
- Gradient intensity and slew rate
- Specific Absorption Rate (SAR)
- Safety limits

Registration Information

Reduced registration fee for **ESR & ESMRMB members!**

Registration

In order to register for your desired course(s), please visit our website at www.esmrmb.org.

Please note that your registration becomes valid only after the receipt of payment and after confirmation by the ESMRMB Office. The confirmation of payment is available for download online in the 'MyUser Area'.

Terms of cancellation
In case of written cancellation of the registration by the participant

> 4 weeks before the course date: the registration fee less 20% for administrative costs will be refunded.
< 4 weeks before the course date: no refund will be granted.

If less than 40 participants register, ESMRMB reserves the right to cancel a course at the latest 4 weeks prior to its beginning. Please keep this in mind for your travel arrangements.

Information regarding the confirmation/cancellation of a course will be announced on our website.

Registration Fee

The registration fee includes:
- Course attendance
- Teaching material for the course (digital syllabus)
- Coffee and Lunch
- Welcome Reception

Participants are responsible for their travel and hotel arrangements.

A list of suitable hotels for the individual courses is available on the ESMRMB website. When making your flight bookings, please make sure that you will be able to stay for the entire course duration.

Courses either start on Thursday morning or noon and last until Saturday noon or evening. The Body Diffusion course starts on Wednesday and lasts until Friday.

A detailed programme of each course can be found online.

Registration is possible online at **www.esmrmb.org**

Early registration fees
(until 8 weeks prior to the course)

Physicists, Physicians, Chemists and other professionals with equivalent university degree:

ESMRMB Members***.....€ 450
ESR Members***.....€ 600
Non-Members.....€ 630

Students*, Residents* and MR radiographers/ technologists:**

ESMRMB Members***.....€ 300
ESR Members***.....€ 350
Non-Members.....€ 380

Late registration fees
(after 8 weeks prior to the course)

Physicists, Physicians, Chemists and other professionals with equivalent university degree:

ESMRMB Members***.....€ 550
ESR Members***.....€ 700
Non-Members.....€ 730

Students*, Residents* and MR radiographers/ technologists:**

ESMRMB Members***.....€ 350
ESR Members***.....€ 420
Non-Members.....€ 450

Rates refer to one course.
If more than one course is booked at once, a 10% reduction will be granted.

MSK Course in St. Petersburg/Russia

As the course on 'Advanced MR Imaging of the Musculoskeletal System' in St. Petersburg lasts only 2 days, instead of the usual 2.5 days, the registration fees for this course are as follows:

Early registration fees
(until 8 weeks prior to the course)

Physicists, Physicians, Chemists and other professionals with equivalent university degree:

ESMRMB Members***.....€ 350
ESR Members***.....€ 500
Non-Members.....€ 530

Students*, Residents* and MR radiographers/ technologists:**

ESMRMB Members***.....€ 200
ESR Members***.....€ 250
Non-Members.....€ 280

Late registration fees
(after 8 weeks prior to the course)

Physicists, Physicians, Chemists and other professionals with equivalent university degree:

ESMRMB Members***.....€ 450
ESR Members***.....€ 600
Non-Members.....€ 630

Students*, Residents* and MR radiographers/ technologists:**

ESMRMB Members***.....€ 250
ESR Members***.....€ 320
Non-Members.....€ 350

eLearning: Basic Course on Applied MR Techniques

Physicists, Physicians, Chemists and other professionals with equivalent university degree:

ESMRMB Members***.....€ 100
ESR Members***.....€ 150
Non-Members.....€ 200

Students*, Residents* and MR radiographers/ technologists:**

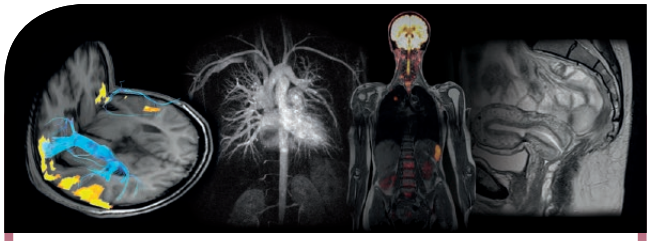
ESMRMB Members***.....€ 50
ESR Members***.....€ 80
Non-Members.....€ 100

* Eligibility for the student and resident status is limited to 6 years following the date of the last diploma (bachelor, masters, medical degree; not applicable for PhD degrees!). A copy of the diploma (bachelor, masters, medical degree) has to be sent to the ESMRMB Office no later than 10 days after the registration in order to validate your registration.
Please note that for residents an attestation from the head of department is not sufficient!
According to the ESMRMB regulations a copy of the diploma is required.

** MR radiographers/technologists are requested to provide an attestation from the head of the institution / head of department no later than 10 days after the registration.

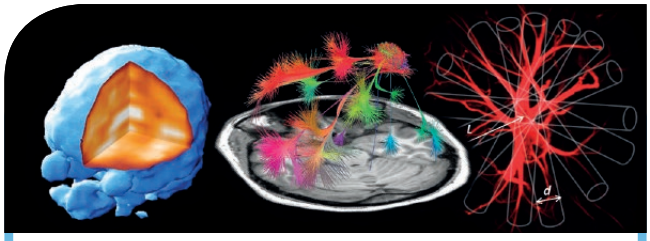
*** Reduced course fees are available for members in good standing who have paid their 2017 ESMRMB/ESR membership fee.

ESMRMB Education



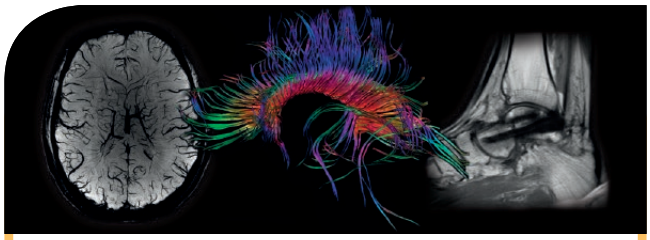
School of MRI

Advanced clinical courses in MR for physicians and technicians



Lectures on MR

Educational courses, exercises, and practical demonstrations on MR physics and engineering



Hands-On MRI

Clinical courses for MR radiographers/technologists and interested physicians with hands-on training (scanner & workstation)

eLearning

ESMRMB School of MRI Online Education – learn from anywhere

ESMRMB

European Society for Magnetic Resonance in Medicine and Biology

ESMRMB Certificate of MR Excellence

APPLY NOW!

The ESMRMB Certificate of MR Excellence honours physicians and scientists, being active members of the ESMRMB and who have made a significant contribution to the field of MR.

There are 3 categories you may apply for:

- Clinical certificate of MR Excellence
- Basic science certificate of MR Excellence
- Educational certificate of MR Excellence

If you are a members of ESMRMB for 3 or more years, make sure to apply for the ESMRMB Certificate of MR Excellence now to prove your excellence in the field of MR.

Find out more on all application details and upcoming deadlines on our website at **www.esmrmb.org.**

ESMRMB

European Society for Magnetic Resonance in Medicine and Biology

ESMRMB Society Journal MAGMA

MAGMA *(Editor-in-Chief: P.J. Cozzone)* is a multidisciplinary international journal devoted to the publication of articles on all aspects of magnetic resonance techniques and their applications in medicine and biology. In addition to Regular Issues, the journal also publishes Special Issues:

Two NEW Special Issues in 2016 !

"Tissue segmentation in MRI"
with Fritz Schick as Guest-Editor

"Ultrahigh Field MR: Cutting Edge Technologies Meet Clinical Practice"
with Thoralf Niendorf, Markus Barth, Frank Kober, Siegfried Trattnig as Guest-Editors

RECENT SPECIAL ISSUES

2014 "X-nucleus magnetic resonance imaging"
with Lothar Schad and Simon Konstandin as Guest-editors

2013 "MRI and PET together: friends or foes"
with Thomas Beyer and Ewald Moser as Guest-editors

MAGMA's impact and dissemination is rapidly increasing

2014 Impact Factor: 2.869 (rank 30 / 125)

2015 Impact Factor: 2.638 (rank 35 / 124)

(category "Radiology, Nuclear Medicine & Medical Imaging")

- MAGMA offers the shortest publication cycle among all MR journals! Only 5 weeks for the reviewing process and 3 weeks for time to publication online after final acceptation
- MAGMA is currently read by thousands of institutions worldwide through the Springer library consortia
- More than 100 full-text articles were downloaded daily in 2015
- As a bonus to authors, MAGMA keeps with its policy of NOT applying charges for color illustrations

An ESMRMB Membership is already available from € 25!

Visit **www.esmrmb.org** for more information on MAGMA, ESMRMB's membership types and benefits as well as membership application.

ESOR
EUROPEAN SCHOOL OF RADIOLOGY

ESOR 2017

OVERVIEW OF ACTIVITIES IN EUROPE

GALEN Foundation Course

Neuroradiology LEVEL I+II
May 25–27, Prague/Czech Republic

GALEN Advanced Courses

Contrast Media for Better Diagnostic Accuracy LEVEL II+III
May 11–12, Valencia/Spain

Advances in Clinical CT LEVEL III
September 8–9, Zurich/Switzerland

Cardio-Thoracic Cross-Sectional Imaging LEVEL II
September 28–29, Heidelberg/Germany

ESOR Courses for EDiR LEVEL II

Chest Imaging
November 6, Vienna/Austria

Cardiac Imaging
November 7, Vienna/Austria

Breast Imaging
November 8, Vienna/Austria

Neuroradiology
November 9, Vienna/Austria

Head and Neck Radiology
November 10, Vienna/Austria

Musculoskeletal Radiology
November 11, Vienna/Austria

Abdominal Imaging
November 13, Vienna/Austria

Hybrid Imaging
November 14, Vienna/Austria

Paediatric Radiology
November 15, Vienna/Austria

Please note that programmes are marked with a logo to indicate their classification according to the European Training Curriculum.

LEVEL I — First three years of training

LEVEL II — Fourth and fifth year of training (general radiologist standard)

LEVEL III — Subspecialty training standard

ASKLEPIOS Courses

Challenges in Head and Neck Imaging LEVEL II+III
March 30–31, Serock/Poland

Emergency Radiology LEVEL II+III
May 4–5, Bucharest/Romania

Advanced Oncologic Imaging LEVEL II+III
May 19–20, Ekaterinburg/Russia

Advanced Abdominal Imaging LEVEL II+III
June 29–30, Yerevan/Armenia

Introduction to Hybrid Imaging in Oncology LEVEL III
August 31 – September 1, Vienna/Austria

Multimodality Course LEVEL II
September 1–2, Split/Croatia

Cardiac and Abdominal Imaging LEVEL I+II
October 18–20, Graz/Austria

Symposium on Imaging Hallmarks of Cancer LEVEL III
October 26–27, Lisbon/Portugal

Multidisciplinary Approach to Cancer Imaging LEVEL III
November 2–3, Rome/Italy

Women's Imaging LEVEL II+III
December 7–8, Bratislava/Slovakia

Visiting Professorship Programmes within the ESR Support Initiative

Oncologic Imaging LEVEL II+III
5th Ukrainian Congress of Radiology
March 21, Kiev/Ukraine

Advanced Neuroimaging LEVEL II+III
Balkan Congress of Radiology
October 12, Budapest/Hungary

Tutorials

Graz Tutorial LEVEL I+II
October 16–20, Graz/Austria

Visiting Scholarship Programmes (3 months) LEVEL II

Exchange Programmes for Fellowships EUROPE/USA LEVEL III
(3 months/6 months)

One-year Fellowships LEVEL III

For the full list of ESOR activities, please visit myESR.org/esor.

ESR EUROPEAN SOCIETY OF RADIOLOGY

Education in partnership