ISMRM 19th ANNUAL MEETING & EXHIBITION
SMRT 20th ANNUAL MEETING

REGISTRATION
AND INFORMATION

REGISTER BY 31 MARCH AND SAVE!

Housing Deadline: 1 April 2011
For more information visit:
www.ismrm.org/11
**Weekend Educational Programs**

**Saturday, 7 May**
- Body MRI: Clinical Practice of Today & Tomorrow
- Advanced Neuroimaging 1
- Molecular & Cellular Imaging
- Predoctoral MR of Cancer: Addressing Clinical Needs
- Functional & Anatomic Data Analysis: Principles & Practicalities
- Diffusion, Perfusion & the Corresponding Physiology
- MR Systems Engineering
- MR Physics for Physicists

**Sunday, 8 May**
- MR Evaluation of the Athlete
- Advanced Neuroimaging 2
- Clinical MR of Cancer: Unsolved Problems from Head-to-Toe
- MR in Drug Discovery & Development
- CV MR Imaging: Clinical Needs & Research Promises
- Advanced fMRI Techniques & Functional Connectivity Assessment
- RF Engineering
- Imaging Strategies
- 17:45-19:15 Opening Reception

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**Overview**

**Monday, 9 May**

**Sunrise Educational Courses**
- 07:30-08:20
  - Welcome
  - ISMRM Medals & Fellow Awards

**Plenary Sessions**
- 8:20-09:00
  - Mansfield Lecture: Challenges in fMRI
- 09:00-10:15
  - Plenary: Functional Brain Networks at "Rest": Mechanisms, Methods & Clinical Utilization
  - Hip Bone & Soft Tissue Pathology – Case-Based Teaching *
  - Oncologic Body Imaging *

**Morning Parallel Sessions**
- 11:00–13:00
  - Scientific Sessions
  - MR Imaging in Brain Tumors – ISMRM/ASNR Joint Session
  - Clinical Protocol Challenges in MSK

**Lunchtime Symposia**
- 13:00–14:00
  - Gold Corporate Member Symposium

**Mid-Day Parallel Sessions**
- 14:00–16:00
  - Scientific Sessions
  - MR Imaging of the Foot & Ankle
  - Spine & Spinal Cord Imaging – ISMRM/ASNR Joint Session
  - Female Pelvis & Bladder – Case-Based Teaching
  - ISMRM/SMRT Joint Forum: DTI: Is It Ready for the Clinic?
  - Your Coils & You: A Primer for Clinician & Scientist

**Afternoon Parallel Sessions**
- 16:30–18:30
  - Scientific Sessions
  - MR Physics & Techniques for Clinicians

**Evening Activities**
- 18:45–20:45
  - Study Group Programs
## Overview

**Clinical Intensive Course (presented in teal color)**  
*Admission to session limited to Clinical Intensive Course registrants only. (See item #3 on registration form.)*

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<td><strong>08:15-09:30</strong></td>
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<td></td>
<td>• Hot Topics in Body MRI</td>
<td><strong>08:15-09:30</strong></td>
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<td>• Plenary: Clinical Needs &amp; Research</td>
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<td>• MRS: Metabolite Profiling &amp; Metabolism</td>
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<td>• Fast &amp; Furious: The New Era of Rapid</td>
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<td>Gold Corporate Member Symposium</td>
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<td><strong>13:30-15:30</strong></td>
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<td>• CV MRI Part 1: Molecular Imaging</td>
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### Mark Your Calendars!

**ISMRM 20th Annual Meeting & Exhibition**  
5-11 May 2012  
Melbourne, Australia
I would like to propose a modification to this quote by William Osler, one of the most revered physicians of his time worldwide: “To study the phenomena of disease without books is to sail an uncharted sea, while to study books without patients is not to go to sea at all.” Osler, a Canadian by birth, spent more than ten years at McGill University in Montréal as a medical educator. With his strong personality, principled morals and persistence, he inspired physicians worldwide to adopt a more humanistic approach to medicine “focused on patients,” rather than personal profit.

“Focusing on the patient” brings deeper meaning to the groundwork laid down by members of our Society over the years, and therefore it is fitting that the ISMRM 19th Annual Meeting will be held in Montréal 7–13 May 2011. Montréal was the home to several world renowned physicians including William Osler and Wilder Penfield, to name a few. Penfield (1891-1976) was a pioneer in cortical mapping of the brain and in the surgical treatment of epilepsy. Many of the cortical maps he generated are currently in use, unaltered. Penfield, who dedicated his life to unraveling the mysteries of the brain, would have marveled at the seemingly endless possibilities available today, for the noninvasive imaging of the brain and its function. Has it changed the world? Stay tuned for our eponymous lectures.

Incorporated into the logo for our 2011 Montréal Meeting is the theme: “Clinical Needs and Research Promises: Bridging the Gap.” Bringing novel applications from the bench to the bedside is one of the basic tenets of our society. Having a forum for dialogue between the basic scientists who are at the forefront of technology development, and the physicians who care for patients, is what draws us together in large numbers at the ISMRM Annual Meeting — “one community for clinicians and scientists.”

Our Montréal meeting theme is woven into the fabric of each plenary with a presentation of a clinical need, followed by potential solutions. These state-of-the-art plenary lectures will cover a wide range of topics that are sure to captivate clinicians and basic scientists alike.

Topics to be covered include Functional Brain Networks at Rest: Mechanism, Methods & Clinical Utilization, Diagnosis & Triage of Acute Coronary Syndromes in the ER, Reducing Radiation: MRI & CT in the Era of Radiation Dose Concern and MRI in the Compromised Pregnancy. In addition, the Wednesday plenary session will be a panel discussion of leading MR experts entitled: “Clinical Needs & Research Promises: In Practice.” This interactive discussion will focus on current and relevant clinical problems and their technological solutions.

We are honoured to have two extraordinary speakers for our Mansfield and Lauterbur lectures this year, whose career paths have intertwined to exemplify our meeting theme. Dr. Seiji Ogawa, a visionary researcher, renowned for his pioneer work in fMRI, will be delivering the Mansfield lecture with the title “Challenges of fMRI.” The Lauterbur lecture entitled “fMRI at 20 – Has It Changed the World?” will be delivered by Dr. Bruce Rosen, a leading researcher and clinician, who has spent the last 30 years focusing on the development and application of fMRI techniques.

The 2011 Montréal meeting promises a very rich and varied educational program under the expert guidance of Jim Pipe, Ph.D., Vice-Chair of the AMPC, and his team of dedicated volunteers. The attendees can select from a wide range of offerings that will satisfy the needs of physicians, clinical and basic scientists, engineers, MR technologists and other providers. Sixteen parallel weekend courses and over 50 weekday courses cover a broad range of topics including: Clinical MR protocols, neuro, body, MSK, CV imaging, cancer diagnosis, hardware engineering, MR physics and preclinical methods. Educational courses target a range of expertise, from the beginner to the expert.

The very enjoyable game show format of “What Went Wrong?” will be given in two parts this year, one for image artifacts and one for MR safety. Whether you attend just for the education or would like to brush up on selected topics while you attend the scientific sessions, education has something for you. In addition, you can learn at your own pace by browsing the Educational e-Exhibits offered for the first time at the Montréal Annual Meeting.
The Clinical Intensive Course for clinicians will be held once again due to popular demand. These interactive courses are designed for clinicians interested in learning best clinical practices from world leaders in areas of neurological imaging, musculoskeletal and body imaging.

Additional meeting innovations for 2011 include educational exhibits, case/artifact of the day, educational introductions in scientific oral sessions and a plenary film panel. Also, please join us Thursday evening for our surprise Montréal-based entertainment at the closing ceremony. Please feel free to visit www.ismrm.org/11 to follow the evolution of the various initiatives planned for the meeting.

Montréal is a beautiful city, combining the romantic aspects of European charm and the modernity of a North American metropolis (www.Montréal-kiosk.com/ Montréal-tourism.php). Montréal is known for its superb cuisine, vibrant nightlife, festivals, cultural diversity and that special “joie de vivre.” Be sure to set aside some time to enjoy the many tourist attractions Montréal has to offer. Take a stroll down the cobble-stoned streets of Montréal’s Old Port (Vieux Port de Montréal) and stop in at the Bonsecours Market, one of Canada’s finest heritage buildings. Bring your runners for an early morning jog on Mount Royal and enjoy a breathtaking view of the city. Stop in at one of the many sidewalk cafés for a delicious cup of morning coffee. The convention center (Palais des Congrès) is located in the heart of downtown Montréal, where the city’s main attractions converge. Fine dining, the shopping and entertainment districts, Chinatown and Old Montréal are all walking distance from the convention center.

On behalf of the program committee, I warmly invite you to join us at the ISMRM’s 19th Annual Meeting in Montréal, May 2011. Combine work with play, discuss optimization of your MR imaging protocols over a fine dining experience with a colleague, and share your latest technical inspirations while climbing the 283 steps to St. Joseph’s Oratory!

À Bientôt!

Caroline Reinhold, M.D.
Chair, Annual Meeting Program Committee

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ISMRM ANNUAL MEETING SESSIONS

Education
Based on analyses of educational needs and practice gaps, our committees have organized over 50 focused educational courses offering CME credit, which will be presented throughout the seven days of the meeting. (Descriptions start on page 10.)

Science
The formal Scientific Sessions on Monday through Friday will include:
- Oral Sessions;
- Traditional Poster Presentations;
- Multi-Media Electronic Poster Presentations; and for the first time
- Educational Electronic Posters.
The content of these sessions will reflect the entire spectrum of submitted papers. This is where participants will present their most recent results. The Society aims to maintain the scientific quality and fair selection of the contributed presentations, based on an anonymous review process involving at least four peers. The composition and themes of the scientific sessions will reflect the number of submissions in a specific category and the most appropriate encompassing topic.

Oral Sessions
In oral scientific sessions, each author will make a nine-minute presentation, followed by three minutes for discussion. These sessions offer CME credit.

Multimedia Electronic Poster Presentations
A multimedia electronic poster session is an informal presentation of the poster at a computer kiosk with the opportunity for scientific or clinical interchange between the authors and other meeting participants. Specific times will be assigned for the authors to be present for discussion.
Electronic posters will be uploaded to the ISMRM prior to the meeting and will be available for viewing throughout the week on computer kiosks in the poster hall.

NEW
As an adjunct to the Scientific Meeting:

Educational Electronic Posters
An Educational E-Poster is a multi-media presentation of educational content on a computer. It may cover material of a technical or clinical nature of interest to society members and students.
Selected Educational E-Posters will be presented orally in a session offering AMA PRA Category 1 Credit™. Otherwise, there will not be formal, scheduled presentations of Educational E-Posters. However, authors are encouraged to be present at their E-Posters as their schedules permit to answer questions and discuss their posters with attendees. This will add substantially to the poster’s educational value.

Traditional Poster Sessions
A poster session is an informal presentation of the poster content with the opportunity for scientific or clinical interchange between the authors and other meeting participants. Specific times for the authors to be present for discussion will be assigned.
A poster may contain text, graphs, photographs, diagrams, etc. affixed to a poster board so it can be viewed.
CLINICAL INTENSIVE COURSE

Saturday, 7 May – Wednesday, 11 May
Clinical Intensive Course Program for CME Credit with Case-Based Teaching

We have selected key clinical educational sessions throughout the meeting, created exclusive additional content and organized them into two CLINICAL INTENSIVE PROGRAMS over five days. In most sessions, an audience response system will be used for an interactive educational experience. Complete overviews of the individual course components can be found on the following pages.

These two Clinical Intensive Course programs will run in parallel with the Annual Meeting from Saturday to Wednesday but will have a different flavor. The programs will incorporate some of the didactic and poster material from the main meeting along with exclusive additional lectures for clinical program registrants. There will also be the opportunity to earn even more CME credits by attending Annual Meeting lectures on hot topics such as MR safety, unmet needs of MRI in various areas and application of the newest hardware, coils and sequences in the field. Registrants will have time during and after the course to review scientific posters and to attend the wide array of other sessions of the main ISMRM meeting, or just simply to take advantage of the wonderful opportunities Montréal provides.

OVERVIEW
There will be one course series in NEURO, and another in BODY/MUSCULOSKELETAL. These two series of clinical course sessions are intended for radiologists and other medical professionals who are interested in brushing up and fine tuning their MR interpretation skills.

We aim to provide practical take-home messages for daily clinical practice:
• Optimizing imaging protocols;
• Recognizing common imaging artifacts (and their remedies); and
• Imaging pearls for diagnosis.

Some course sessions will be case-based, using an interactive audience response system.

NEUROIMAGING COURSE
Organizers:
Pia C. Maly Sundgren, M.D., Ph.D. & Jeffrey Joseph Neil, M.D., Ph.D.

EDUCATIONAL OBJECTIVES
Upon completion of the neuro program, participants should be able to:
• Describe recent overall advances in neuroimaging;
• Describe some of the new advances in MRI of the brain and brain tumors;
• Decide when to use MR spectroscopy in clinical situations;
• Describe common infections of the brain and spine; and
• Explain new MR sequences and what they may add to the diagnosis of different diseases.

BODY & MUSCULOSKELETAL IMAGING COURSE
Organizers:
Christine Chung, M.D., Shahid M. Hussain, M.D., Lynne S. Steinbach, M.D. & Bachir Taouli, M.D.

EDUCATIONAL OBJECTIVES
Upon completion of the body and musculoskeletal program, participants should be able to:
• Implement optimized protocols for musculoskeletal and body imaging;
• Describe anatomy, normal variants and pitfalls in MR images of the musculoskeletal system and the body;
• Diagnose abnormalities on MR images of the musculoskeletal system and body;
• Implement recent updates in the field of MRI; and
• Describe current MR approaches for a variety of abnormalities in the musculoskeletal system and the body.
MANSFIELD LECTURE (Monday, 9 May)

Challenges in fMRI
Professor Seiji Ogawa, Ph.D.

Dr. Ogawa is currently Professor at Kansei Fukushi Research Center, Tohoku Fukushi University, Sendai, Japan.

Dr. Ogawa trained as an applied physicist in Tokyo and obtained his doctorate degree in chemistry at Stanford University, California, in 1967. In 1968 he joined the Technical Staff in Biophysics Research at the Bell Laboratories in Murray Hill, New Jersey, where he established himself as a distinguished researcher during his 33-year career. In 2001 he became Director of the Ogawa Laboratories for Brain Function Research in Tokyo. During his career he has published several landmark papers on fMRI. Overall, Dr. Ogawa has published over 90 peer-reviewed articles and has edited two books.

Dr. Ogawa is the recipient of several prestigious awards in magnetic resonance, including the Gold Medal Award from the Society of Magnetic Resonance in Medicine in 1995. In 2003 he received the Japan International Prize from the Japan Science Technology Foundation for discovery of the principle for fMRI, and the Gairdner International Award from the Gairdner Foundation for his use of fMRI in the non-invasive imaging of the brain.

LAUTERBUR LECTURE (Thursday, 12 May)

fMRI at 20 – Has It Changed the World?
Professor Bruce R. Rosen, M.D., Ph.D.

Dr. Rosen is Professor of Radiology at Harvard Medical School and Professor of Health Sciences and Technology at the Harvard Medical School-Massachusetts Institute of Technology Division of Health Sciences and Technology. He is Director of the Athinoula A. Martinos Center for Biomedical Imaging at Massachusetts General Hospital, MIT and the Harvard Medical School. He received his Ph.D. in medical physics from MIT and his M.D. from the Hahnemann Medical College in Philadelphia, PA, and is board certified in radiology.

Dr. Rosen’s research over the past 30 years has focused on the development and application of physiological and functional NMR techniques. His recent work has focused on the fusion of fMRI data with information from other modalities, including very high temporal resolution signals using magnetoencephalography (MEG), noninvasive optical imaging and now PET. His work has been published in more than 240 peer-reviewed articles as well as 39 book chapters and reviews.

Dr. Rosen leads the activities of several large interdisciplinary and inter-institutional research and training programs that focus on the development of novel biomedical imaging technologies and their application to diverse programs of basic and clinical research. These programs include the NIH/NCRR Regional Resource Center, the Center for Functional Neuroimaging Technologies (CFNT), the Biomedical Informatics Research Network (BIRN) and others. He has mentored dozens of graduate students and research fellows through the years, including several ISMRM Young Investigator Award winners and finalists.

A Fellow of the Society, Dr. Rosen was honored with the Gold Medal in 1997 for his work in fMRI, and he has chaired and served on numerous committees of the ISMRM.

PLENARY SESSIONS

Preceding the scientific sessions each day, the plenary sessions will cover a broad range of critical and contemporary topics that will appeal to all attendees and dovetail with the Mansfield and Lauterbur lectures. This year’s meeting theme, Clinical Needs & Research Promises: Bridging the Gap, has been woven into the fabric of each plenary with the goal of:

- Presenting an important clinical need;
- Reviewing current practices and their limitations; and
- Outlining MR developments that can bridge this gap.

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<th>Mansfield Lecture: Challenges in fMRI</th>
<th>Professor Seiji Ogawa, Ph.D.</th>
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<td>Monday, 9 May</td>
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<td>Organizers: Peter A. Bandettini, Ph.D. Mark J. Lowe, Ph.D.</td>
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<td>Tuesday, 10 May</td>
<td>Diagnosis &amp; Triage of Acute Coronary Syndromes in the Emergency Room</td>
<td>Organizers: David E. Sosnovik, M.D. Matthias Stuber, Ph.D.</td>
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<td>Wednesday, 11 May</td>
<td>Clinical Needs &amp; Research Promises: In Practice, Panel Discussion</td>
<td>Organizers: Vivian S. Lee, M.D., Ph.D. Mark A. Griswold, Ph.D. Georg Bongartz, M.D. Caroline Reinhold, M.D.</td>
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<th>Thursday, 12 May</th>
<th>Lauterbur Lecture: fMRI at 20 – Has It Changed the World?</th>
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<td>Reducing Radiation: MR &amp; CT in the Era of Radiation Dose Concerns</td>
<td>Organizers: Bachir Taouli, M.D. Thoralf Niendorf, Ph.D.</td>
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<td>Friday, 13 May</td>
<td>MRI in the Compromised Pregnancy</td>
<td>Organizers: Penny Anne Gowland, Ph.D. Evis Sala, M.D., Ph.D., F.R.C.R.</td>
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**ANNUAL MEETING 7-13 MAY 2011**

**Location**
Palais des congrès de Montréal
201 Viger Street West, Montréal, QU, H2Z 1X7, Canada

**Meeting Program Details**
The meeting program will be available online through the ISMRM Website:
www.ismrm.org/11

**For more information please contact the ISMRM Central office**
E-mail: info@ismrm.org
Telephone: +1 510 841 1899

**Credit Designation**
The International Society for Magnetic Resonance in Medicine designates this educational activity for a maximum of 52.75 AMA PRA Category 1 Credits. Physicians should only claim credit commensurate with the extent of their participation in the activity.

**Admission**
By meeting badge only

**Restrictions**
Children under 16 are not allowed in any meetings or evening events

**TECHNICAL EXHIBITION HOURS**

**Location**
Palais des congrès de Montréal
201 Viger Street West, Montréal, QU, H2Z 1X7, Canada

**Dates and Open Hours**
17:45–19:15  Sunday, 8 May (Opening Reception)
09:30–16:30  Monday–Wednesday, 9–11 May
09:00–16:00  Thursday, 12 May

**Poster Viewing Hours**
07:00–14:00  Sunday, 8 May (Poster Installation)
07:00–20:30  Monday, 9 May (Viewing)
07:00–19:45  Tuesday, 10 May (Viewing)
07:00–21:30  Wednesday, 11 May (Viewing)
07:00–16:30  Thursday, 12 May (Viewing); 16:30–18:00 (Dismantle)

**Admission**
By meeting badge only

**Restrictions**
Children under 16 are not allowed on the exhibit floor

**EDUCATIONAL COURSES LISTED BY TOPIC**

The ISMRM is pleased to present educational courses at the 19th Annual Meeting & Exhibition in eight industry-critical categories.

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ISMRM EDUCATIONAL COURSE TOPIC:

BODY IMAGING

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Body MRI: Clinical Practice of Today & Tomorrow
Clinical Intensive Course Option
Saturday, 7 May • Skill Level: Basic–Intermediate

This one-day course will cover cutting-edge MR technical and clinical areas for body MR radiologists, residents and MR technologists looking to introduce or improve the use of advanced methods into their practice. Lectures will address in detail the current state-of-the-art protocols at 1.5T, recent advances in abdominal MRI at 3.0T, pertinent aspects of diffusion imaging for body MR and applications of such MRI techniques in different disease processes involving liver (including liver transplant), kidneys, pancreas, rectal cancer staging, multi-parametric prostate imaging and female pelvis focused on the uterus.

Organizers:
Shahid M. Hussain, M.D.
Caroline Reinhold, M.D.
Evis Sala, M.D., Ph.D., F.R.C.R.

Hot Topics in Body MRI (Four Sessions)
Sunrise Educational Course • Tuesday–Friday, 10–13 May • Skill Level for All Days: Intermediate–Advanced

Day 1: Diffusion Imaging: Body Applications
Clinical Intensive Course Option
This session will cover the technique of diffusion weighted imaging as applied to body MRI and two clinical areas. We will address in detail the technique of diffusion weighted imaging and its applications to liver and renal lesion detection and characterization.

Organizers:
Dow-Mu Koh, M.D., M.R.C.P.
Bachir Taouli, M.D.

Day 2: MRI of the Uterus
Clinical Intensive Course Option
This session will cover the pelvic pain and the uterine congenital abnormalities relevant to body MRI with the goal of improving knowledge of the role of MRI in pelvic pain and uterine congenital abnormalities. Lectures will illustrate how MRI can be applied to assess the disease processes in both areas.

Organizers:
Caroline Reinhold, M.D.
Evis Sala, M.D., Ph.D., F.R.C.R.

Day 3: Treated Liver & Renal Lesions
This session will cover the treated liver lesions and small renal lesions that often create diagnostic challenges in daily clinical practice. Increasing numbers of patients with primary liver lesions and liver metastases undergo minimally invasive treatment, altering the appearance of the liver lesions. MRI is a unique modality that can monitor these effects of treatment. Comprehensive MRI can also facilitate the detection and characterization of small renal lesions that often are difficult to diagnose with other imaging modalities, including CT.

Organizers:
Shahid M. Hussain, M.D.
Bachir Taouli, M.D.

Day 4: Male & Female Pelvis
This session will cover the male and female pelvic floor, in particular, the non-oncologic aspects. Lectures will describe in detail the anatomy of the pelvic floor, illustrate female pelvic floor abnormalities and non-oncologic abnormalities of the male pelvis.

Organizers:
Caroline Reinhold, M.D.
Evis Sala, M.D., Ph.D., F.R.C.R.
ISMRM EDUCATIONAL COURSE TOPIC: BODY IMAGING

(continued on page 12)

**Oncologic Body Imaging**
**Clinical Intensive Course Option**
*Monday, 9 May • Skill Level: Intermediate–Advanced*

This 1½-hour course is designed to demonstrate the current/traditional (morphology-based) methods as well as novel methods for tumor response assessment. Speakers will describe:
- How we currently utilize CT and MRI to assess treatment response;
- How the novel methods based on diffusion and perfusion imaging can be utilized to improve the assessment of tumor response; and
- The role of whole body MRI in oncology.

Organizers:
Shahid M. Hussain, M.D.
Bachir Taouli, M.D.

**Female Pelvis & Bladder**
**Clinical Intensive Course Option**
*Monday, 9 May • Skill Level: Intermediate–Advanced*

This interactive two-hour course will utilize an audience response system. Topics include bladder tumors, ovarian lesion characterization, ovarian cancer staging and follow-up after treatment, and pregnant patients. Lectures will address how to utilize MR imaging to:
- Assess bladder tumors;
- Characterize adnexal lesions;
- Stage ovarian cancer, evaluate the treatment response and detect recurrence; and
- Apply MRI to meet the diagnostic challenges of pregnant patients.

Organizers:
Talissa Altes, M.D.
Shahid M. Hussain, M.D.
Evis Sala, M.D., Ph.D., F.R.C.R.

**Liver MRI: How I Do It**
**Clinical Intensive Course Option**
*Tuesday, 10 May • Skill Level: Intermediate–Advanced*

Liver MRI can often provide very specific diagnosis of focal liver lesions, biliary abnormalities and vascular disorders. It is often challenging to make the right choice of sequences and contrast media to perform and interpret liver MRI. This 1½-hour course will describe:
- How to optimize liver MRI protocol;
- The available contrast media and their choice;
- A step-by-step approach essential to assess focal liver lesions; and
- How to evaluate diffuse liver disorders.

Organizers:
Shahid M. Hussain, M.D.
Bachir Taouli, M.D.
Artifacts in Body MRI – Case-Based Teaching
Clinical Intensive Course Option
Tuesday, 10 May • Skill Level: Intermediate–Advanced
This interactive two-hour course will utilize an audience response system. The focus will be on artifacts in body MRI, with lectures addressing how to recognize and potentially resolve artifacts in diffusion-weighted and other sequences utilized for body MRI. The artifacts will be discussed in a unique and interactive way to enhance the understanding of the basic concepts behind the artifacts as well as their clinical significance.

Breast MRI – Case-Based Teaching
Clinical Intensive Course Option
Wednesday, 11 May • Skill Level: Intermediate–Advanced
This interactive course will feature an audience response system. In two hours it will cover a number of important aspects of breast cancer, including imaging of the dense breast, lymph node imaging from a clinical viewpoint and case-based approach to various breast lesions important in clinical practice. Lectures will address how to utilize MRI in breast cancer as well as to improve the understanding of the clinical perspective on lymph node imaging for breast cancer.

Organizers:
Shahid M. Hussain, M.D.
Caroline Reinhold, M.D.
Margaret A. Hall-Craggs, M.D.
Caroline Reinhold, M.D.


ISMRM EDUCATIONAL COURSE TOPIC:
CARDIOVASCULAR IMAGING

- **Cardiovascular MR Imaging: Clinical Needs & Research Promises**
  *Sunday, 8 May • Skill Level: Basic–Intermediate*
  
  This one-day course will provide the participant with a broad overview of the physical principles and clinical background of cardiovascular MR imaging. One-hour blocks will provide clinical background and what clinicians want from a cardiovascular MR study, followed by acquisition and post-processing strategies. Each topic is concluded by a lecture on research promises on the edge of clinical implementation. Topics to be covered include: cardiac function, perfusion, viability imaging, coronary artery imaging, evaluation of flow, 3T cardiac MR, cost effectiveness of cardiac MR and MR angiography. Course instructors are Ph.D.s and M.D.s.

  **Organizers:**
  
  Tim Leiner, M.D., Ph.D.
  Mitsue Miyazaki, Ph.D.
  David E. Sosnovik, M.D.

- **Cardiovascular MR Imaging: Bridging the Gap between Research & Clinical Problems**
  *Sunrise Educational Course, Tuesday–Friday, 10–13 May • Skill Level: Advanced*
  
  This four-hour course will review state-of-the-art topics in cardiovascular MRI. Topics to be covered are:
  
  - Stress MRI for the evaluation of coronary artery disease including acquisition and post-processing techniques;
  - The role of cardiac MRI in the pre-and post-interventional workup of cardiac arrhythmias; and
  - MRI for evaluation of the vessel wall and non contrast-enhanced MR techniques for MRA, BOLD, ASL and evaluation of vessel function.

  Content will include acquisition strategies, post-processing of data and clinical background regarding the use of these MR techniques. Course instructors are Ph.D.s and M.D.s.

  **Organizers:**
  
  Thoralf Niendorf, Ph.D.
  Matthias Stuber, Ph.D.

- **Cardiovascular MR Imaging: Exploring the Boundaries**
  *Tuesday–Thursday, 10-12 May • Skill Level: Advanced*
  
  This six-hour course in three sessions on Tuesday, Wednesday and Thursday will review two cutting-edge topics in cardiovascular MRI and also offers a case-reading session.

  **Part 1: Cardiovascular Molecular Imaging**
  
  The first session will cover the latest developments in cardiovascular molecular imaging, including contrast agents, hybrid systems and potential clinical applications. Instructors will be Ph.D.s and M.D.s.

  **Part 2: Ultra-High Field Cardiovascular MRI**
  
  The second session will be devoted to ultra-high field cardiovascular MR at 7T. Clinical opportunities are discussed as well as RF and coil technology, and emerging applications. Content will include acquisition strategies, post-processing of data and clinical background regarding the use of these MR techniques. Instructors will be Ph.D.s and M.D.s.

  **Part 3: Case-Based Studies in CMR**
  
  The third session will be devoted to case-based studies in CMR and is primarily geared towards a physician audience. Instructors in this part of the course are M.D.s.
ISMRM EDUCATIONAL COURSE TOPIC:
CELLULAR, MOLECULAR & CANCER

(continued on page 15)

- **Molecular & Cellular Imaging**
  
  *Saturday, 7 May • Skill Level: Intermediate–Advanced*

  This one-day course will begin with a description of how contrast agents can be used to endow cells with MR-visible properties, and then how this enables tracking of stem cells and immune cells in various disease models. Different molecular probes will be described, of which some can provide contrast with other modalities. Some focus will be on combining these probes with therapeutic drugs in targeting of surface receptors. We will also cover issues involved with translating molecular imaging from small rodents to large animal models, and with clinical translation.

  **Organizers:**
  
  Jeff W. M. Bulte, Ph.D.
  Willem M. Mulder, Ph.D.

- **Preclinical MR of Cancer: Addressing Clinical Needs**
  
  *Saturday, 7 May • Skill Level: Basic–Intermediate*

  This one-day course will focus on cancer in preclinical models, and will integrate MR imaging, MR spectroscopy and MR spectroscopic imaging studies. The first part will be geared to beginners, and will describe the basic “how to” aspects of a range of preclinical methods in different types of models. The second part of the course will be geared to beginners/intermediates, and will describe the application of the methods outlined in part one to preclinical cancer research. It will cover well-established applications and emerging state-of-the-art approaches. It is hoped that the second part will also prepare participants for new cancer-related MR applications that may emerge in the next few years.

  **Organizers:**
  
  Carles Arús, Ph.D.
  Sabrina M. Ronen, Ph.D.

- **Clinical MR of Cancer: Unsolved Problems from Head-to-Toe**
  
  *Sunday, 8 May • Skill Level: Intermediate*

  This one-day course will focus on the role of clinical MR methods with a view to meeting current challenges in clinical diagnosis and management and of drug development. The program is patient-focused, anatomically-driven (head-to-toe) and comparative. Via didactic lectures we will discuss clinical issues in need of advancement, putting into context the impact of imaging on the cancer patient journey. The course will cover limitations of current approaches, compare MR approaches with other techniques and appraise the potent impact of imaging advances in clinical care.

  **Organizers:**
  
  N. R. Jagannathan, Ph.D.
  Anwar R. Padhani, M.R.C.P., F.R.C.R.

- **MRS: Metabolite Profiling & Metabolism**
  
  *Sunrise Educational Course • Tuesday–Friday, 10–13 May • Skill Level: Intermediate*

  This four-hour course will be focused on new methodologies of advanced MRS. The goals of the course are to demonstrate:
  
  - Potentials of high field MRS for neuroscience, cancer research and clinical diagnostics;
  - The strength of metabolite profiling by advanced MRS for disease diagnosis and treatment; and
  - The potentials of imaging cancer metabolism using hyperpolarized substances.

  **Organizers:**
  
  Kevin M. Brindle, D.Phil.
  Ivan Tkac, Ph.D.
Mouse Imaging: How to Do It Faster, Cheaper & Better
Thursday, 12 May • Skill Level: Basic–Intermediate

This two-hour course is designed to provide practical recommendations for mouse screening using MRI and MRS techniques. It will provide necessary information for optimizing the experimental protocol for high throughput and high reproducibility. The goal of the course will be focused on animal handling, anesthesia, physiology monitoring, optimization of MRI and MRS techniques and data processing. We will provide practical recommendations for improving the efficiency of mouse screening, e.g. to increase the data quality and to speed up the measurement as much as possible.

Organizers:
Klaas Nicolay, Ph.D.
Ivan Tkac, Ph.D.

LEARN FROM THE MR EXPERTS & EARN 7.5 CME or CE CREDITS

ISMRM on the Road
2011 Case-Based MR Clinical Education Series

Organizers: Joshua M. Farber, M.D., Radiology Associates of Northern Kentucky, Crestview Hills, Kentucky, USA & Walter Kucharczyk, M.D., F.R.C.P.C., University of Toronto, Toronto, Ontario, Canada

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ISMRM EDUCATIONAL COURSE TOPIC:
CROSS-CUTTING & EMERGING TECHNOLOGIES

(continued on page 17)

- **MR in Drug Discovery & Development**
  *Sunday, 8 May • Skill Level: All Levels*
  This one-day course will provide an introduction to the use of MR in drug discovery and development, with reference to a range of disease areas. It will be delivered by representatives from the pharmaceutical industry and academic communities as presentations with question and discussion opportunities. The principal topics will include the role of MR biomarkers in drug discovery and development for cancer, musculoskeletal diseases, cardiovascular diseases, neurology and psychiatry and respiratory diseases. The roles of industry-academic interactions, animal and human imaging, and competing technologies will also be covered.

  **Organizers:**
  Kevin M. Brindle, D.Phil.
  Geoffrey J. M. Parker, Ph.D.

- **Fast & Furious: The New Era of Rapid Imaging**
  *Sunrise Educational Course • Tuesday–Friday, 10–13 May • Skill Level: All Levels*
  This four-hour course will explore the current and evolving state of the art in rapid imaging. Framed as an extended conversation between clinicians and basic scientists, each of the four sessions will feature interlinked talks on a particular body area or application cluster:
  • Day 1 – fast cardiovascular imaging;
  • Day 2 – fast body imaging;
  • Day 3 – fast neuroimaging; and
  • Day 4 – fast fetal/neonatal imaging.
  For each area, a clinician will describe current practices and identify particular unsolved problems and unmet needs which can be addressed by increasing imaging speed. A basic scientist will then respond to this list of needs by describing current and emerging rapid imaging techniques and technologies, including such topics as compressed sensing, highly parallel reception, parallel transmission and moving-table imaging. Some talks will be sequential, and others interleaved to promote conversation and interaction.

  **Organizers:**
  Roland Bammer, Ph.D.
  Douglas C. Noll, Ph.D.
  Daniel K. Sodickson, M.D., Ph.D.
  Bachir Taouli, M.D.

- **Image Analysis**
  *Sunrise Educational Course • Tuesday–Friday, 10–13 May • Skill Level: Intermediate–Advanced*
  This four-hour course will present a timely update of recent advances in image analysis, including description of the theoretical basis for, and practical approaches to, the analysis and characterization of images of individuals and groups. The speakers will be our leading experts in the development and application of image analysis techniques, and lectures will offer an overview of the theory underlying image analysis techniques at the forefront of research, and a discussion of the practical application of image analysis techniques in clinical and translational research. We will cover pitfalls of existing techniques, recent developments and clinical applications of image analysis. The main topics are:
  • Image Segmentation;
  • Image Registration;
  • Image texture; and
  • DCE-MRI.

  **Organizers:**
  Henry Rusinek, Ph.D.
  Simon K. Warfield, Ph.D.
Molecular Imaging & Contrast Agents

Sunrise Educational Course • Tuesday–Friday, 10–13 May • Skill Level: Intermediate

This four-hour course will provide an overview of the different molecular imaging techniques used in MRI. It will cover standard contrast agents, fluorinated agents, CEST agents and hyperpolarized agents. It is intended to provide an introduction to these agents for people who are experienced in MR either as clinicians or basic scientists.

ISMRM/SMRT Joint Forum: DTI: Is It Ready for the Clinic?

Monday, 9 May • Skill Level: Intermediate–Advanced

This two-hour course is a joint collaboration between the ISMRM and SMRT, and is designed to showcase the unique contribution each society brings to the clinical field of magnetic resonance. It aims to begin the process of helping establish clear guidelines for the use of DTI in the clinical arena, and includes contributions from M.D.s, scientists, technologists/radiographers and clinicians working in the field of MR. The principal topic to be covered is diffusion tensor imaging in the brain. The overall goal of this session is to begin a dialog to help produce clinical guidelines for the use of this method in the clinic. The format will include presentations, point-counterpoint discussion and debate from the panel and the floor.

Your Coils & You: A Primer for the Busy Clinician & the Curious Scientist

Monday, 9 May • Skill Level: Basic

RF transmitter and detector coils are nearly universal requirements for MRI, and their proper selection, placement, and use is a strong determinant of image quality. However, most educational offerings on RF coils are targeted to their designers rather than their users, to emerging or established RF engineers rather than to clinicians or basic scientists who simply wish to make the best use of the coils to which they have access. This two-hour course is designed for those without an extensive engineering background, who wish to understand the basic principles, best use and current and future applications of RF coils. Lecture topics will be:
• What is an RF coil?;
• A buyer’s and user’s guide to RF coils;
• What can coils do?; and
• Coils in 2020.

All lectures will be delivered with an eye towards informing everyday clinical and research practice.

MR Physics & Techniques for Clinicians

Clinical Intensive Course Option

Monday–Thursday, 9–12 May • Skill Level: Basic–Intermediate

This eight-hour course over four days will be a basic and comprehensive review of MRI physics and techniques. The presentations will be non-mathematical and suitable for clinicians and physicists new to the field. The course will cover the basic principles of MR physics (signal generation, encoding, and relaxation), pulse sequence design and timing diagrams, spin-echo imaging, gradient-echo imaging, fast spin-echo imaging and a variety of more advanced techniques including ultra-fast imaging, parallel imaging, high field imaging, perfusion imaging, diffusion imaging, the use of contrast agents and functional MR imaging.
Bridging the Gap between MR & ER

Tuesday, 10 May • Skill Level: Intermediate–Advanced

This two-hour course will define the imaging necessities in emergency medicine with a dedicated focus on the future options for MRI compared to the current application of (mainly) CT. Both imaging requirements in general at emergency situations and potential benefits of MR in this situation will be elaborated. The course will focus on various typical clinical situations such as head injury and body emergencies and will offer insight into the technical solutions for the typical challenges when applying MRI to the critically ill patient. It will offer practical guidelines for today’s applications and insight into technical developments suited for ER application of MR.

Organizers:
Roland Bammer, Ph.D.
Georg M. Bongartz, M.D.

Clinical Applications of Ultra-High Field 7T MR: Moving to FDA/EU Approval

Wednesday, 11 May • Skill Level: Intermediate

This two-hour course will focus on the potential of ultra-high field 7T MRI to provide clinically valuable information beyond that provided by conventional 3T and 1.5T scanners. It will present the experiences and perspectives of radiologists experienced in this field, a scientist reviewing new techniques to enable additional applications and a talk outlining the requirements necessary to achieve FDA/EU approval for clinical 7T MRI exams. The talks will cover recent 7T MRI studies of patients with dementia, brain tumors, traumatic brain injury, MS, epilepsy and other diseases. Our goal is to provide the participants with an understanding of current and emerging 7T medical research applications and their potential for future clinical MRI exams.

Organizers:
Soonmee Cha, M.D.
Daniel B. Vigneron, Ph.D.

Iron Detection & Quantification

Thursday, 12 May • Skill Level Basic

This two-hour course will include an overview of noninvasive MR methods for diagnosis and quantification of iron in tissues by an expert physicist. In addition, we will cover the role of MRI for diagnosis of brain iron deposition, cardiac iron deposition and liver iron deposition, with background clinical relevance.

Organizers:
Penny Anne Gowland, Ph.D.
Bachir Taouli, M.D.

MR Safety: A Risk-Benefit Approach – Case-Based Teaching

Thursday, 12 May • Skill Level: Basic–Intermediate

This interactive two-hour course will feature an audience response system. It will offer a review of MR safety aimed at both clinical and research users’ MR instruments, and will focus on issues related to providing a safe and optimal environment for the full spectrum of MRI imaging procedures. Specifically, issues to be addressed will include patient screening, room design, scanning of conditional/potentially dangerous implanted devices, MRI interventional procedures and safety issues at ultra-high fields.

Organizer:
Micheal D. Phillips, M.D.
### ISMRM EDUCATIONAL COURSE TOPIC: DIFFUSION, PERFUSION & QUANTITATIVE ANALYSIS

(continued on page 20)

#### Functional & Anatomic Data Analysis: Principles & Practicalities
*Saturday, 7 May • Skill Level: Intermediate–Advanced*

This one-day course will cover both functional and anatomic data analysis and will be presented by physicists, statisticians and clinicians. The overall goal is to provide a perspective and some practical guidelines for some cutting-edge research, clinical functional and anatomic analysis methods. For functional data analysis, lectures will be given on pre- and post-processing approaches as well as on more advanced methods and issues, such as univariate vs. multivariate approaches, model-based vs. exploratory approaches and clinical fMRI analyses. In the anatomic data analysis session, topics will range from comparing cortical and subcortical structures in populations, to analysis methods for diffusion tensor imaging. The issue of anatomic change assessment for large changes with disease, as well as subtle changes with learning and plasticity, will also be discussed. Lastly, a practical perspective will be provided on what types of analyses are typically performed clinically.

**Organizers:**
Peter A. Bandettini, Ph.D.
Carlo Pierpaoli, M.D., Ph.D.

#### Diffusion, Perfusion & the Corresponding Physiology
*Saturday, 7 May • Skill Level: Intermediate–Advanced*

This one-day, intermediate-level course is designed for scientists and clinicians who are interested in a relatively non-technical, yet scientifically rigorous, overview of diffusion and perfusion MRI. The course will be taught in two parts, covering image acquisition, experimental design and data analysis of these techniques. The morning will cover the fundamentals of diffusion imaging, and progress on to more advanced topics in modeling and biological interpretation of diffusion in cerebral white matter. The afternoon will be dedicated to perfusion MRI, covering both dynamic susceptibility contrast MRI and arterial spin labeling. Beside describing the basics of these techniques, an overview will be given of the physiology of the cerebral microvasculature, including the local and systemic regulation of cerebral blood flow.

**Organizers:**
Karla L. Miller, Ph.D.
Carlo Pierpaoli, M.D., Ph.D.
Matthias J. P. van Osch, Ph.D.

#### Advanced fMRI Techniques & Functional Connectivity Assessment
*Sunday, 8 May • Skill Level: Advanced*

This one-day advanced course will cover a range of recent advances in functional MRI, including both technical developments and recent experimental methods. Lectures will cover topics in engineering/physics, basic neuroscience and clinical neurology. Principal topics covered will include:
- State-of-the-art fMRI acquisition techniques;
- Novel contrast mechanisms for measuring brain activity;
- Concepts and techniques for functional connectivity; and
- Use of functional connectivity in basic and clinical neuroscience.

The goal is to provide scientists with a basic understanding of functional MRI with an overview of the most recent advances in fMRI methodology.

**Organizers:**
Peter A. Bandettini, Ph.D.
Karla L. Miller, Ph.D.
ISMRM EDUCATIONAL COURSE TOPIC:
DIFFUSION, PERFUSION & QUANTITATIVE ANALYSIS

Absolute Beginners’ Guide to Anatomical & Functional MRI of the Brain
Sunrise Educational Course • Tuesday–Friday, 10–13 May • Skill Level: Basic
This four-hour basic level course will cover both functional and anatomic data collection principles and basic data analysis methods, and will be given by physicists, statisticians and experts in fMRI and MRI in general. The overall goal of this course is to provide a basic perspective and some practical guidelines for basic research with fMRI, perfusion MRI and anatomic MRI techniques. Lectures will discuss basics of these common techniques.

Clinical Decision Making with Advanced Techniques — Case-Based Teaching
Tuesday, 10 May • Skill Level: Intermediate
This interactive course will feature an audience response system. The two-hour case-based session will provide an overview of how advanced neuro techniques, like fMRI, DTI and perfusion imaging, can be employed in the diagnostic process. The goal is to provide technologically oriented scientists with an understanding of how clinicians employ advanced MRI techniques in clinical decision making. The following techniques will be covered:
• fMRI;
• Perfusion imaging (ASL);
• Diffusion tensor imaging; and
• Perfusion imaging (DSC-MRI and DCE-MRI).
Lecturers will be highly experienced in the clinical use of these advanced techniques.

Organizers:
Peter A. Bandettini, Ph.D.
Karla L. Miller, Ph.D.

Organizer:
Matthias J. P. van Osch, Ph.D.

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MR Evaluation of the Athlete
Clinical Intensive Course Option

Radiologists with extensive experience in imaging of the musculoskeletal system represent the majority of the faculty in this one-day course. The course leverages the use of two highly experienced and subspecialized orthopedic surgeons who will discuss clinically relevant issues in the athlete and indications for MRI. Further, they will emphasize how those findings guide treatment. Radiologists will then discuss imaging anatomy, diagnostic criteria and methods of injury characterization. The interaction between these clinically based talks and radiologists provide an optimal situation for solidifying the clinical presentation of the injured athlete with the MRI findings. The course will be inclusive of sports injuries across several articulations.

Organizers:
Christine Chung, M.D.
Hollis G. Potter, M.D.

Translational Imaging: Animal Models in MSK
Sunrise Educational Course, Tuesday–Friday, 10-13 May • Skill Level: Advanced

This four-hour course over four mornings assesses the use of animal models in musculoskeletal research. It addresses challenges and applications of specific models and how they translate to clinical applications. Radiologists, orthopedic surgeons and basic scientists will provide up-to-date knowledge of these quickly developing research topics.

Organizers:
Bernard J. Dardzinski, Ph.D.
Hollis G. Potter, M.D.

Hip Bone & Soft Tissue Pathology – Case-Based Teaching
Clinical Intensive Course Option

Monday, 9 May • Skill Level: Basic–Intermediate

This course will demonstrate relevant hip abnormalities using a case-based approach. Typical examples will be used for demonstration of adequate imaging protocols, followed by cases useful for the discussion of indications for MR imaging. The most relevant abnormalities will be covered, including commonly encountered osseous and soft tissue abnormalities of the hip (excluding that of femoroacetabular impingement). Current topics from the literature including rotator cuff pathology of the hip, metallosis and bisphosphonate induced insufficiency fractures will be addressed.

Organizers:
Christine Chung, M.D.
Lynne S. Steinbach, M.D.

Clinical Protocol Challenges in Musculoskeletal Radiology
Clinical Intensive Course Option

Monday, 9 May • Skill Level: Basic–Intermediate

In this two-hour course, radiologists with extensive experience in imaging of the musculoskeletal system will represent the majority of the faculty. The course will focus on optimizing MR protocols, and specifically address high-field MR, post-operative imaging and the pediatric patient. It will guide the audience through all clinically relevant aspects of optimizing clinical protocols for the musculoskeletal system, including imaging techniques, specific parameters and patient positioning. Further, it will provide this information while applying it to commonly encountered applications within daily MSK MR practice in clinical scenarios.

Organizers:
Christine Chung, M.D.
Bernard J. Dardzinski, Ph.D.
Hollis G. Potter, M.D.
ISMRM EDUCATIONAL COURSE TOPIC:
MUSCULOSKELETAL IMAGING

- **MR Imaging of the Foot & Ankle**
  Clinical Intensive Course Option
  *Monday, 9 May • Skill Level: Intermediate*
  
  This course will discuss three main topics important in clinical MR imaging: evaluation of the forefoot, ankle tendons and miscellaneous conditions of the ankle that include nerve entrapment phenomena. Three experienced radiologists from different institutions will discuss these various aspects of the foot and ankle.

  Organizers:
  Christine Chung, M.D.
  Lynne S. Steinbach, M.D.

- **MRI of Elbow, Wrist & Hand Imaging**
  Clinical Intensive Course Option
  *Tuesday, 10 May • Skill Level: Intermediate*
  
  This course will cover several topics important for clinical MR imaging: elbow tendon evaluation, triangular fibrocartilage and intrinsic ligament evaluation of the wrist, and evaluation of the hand in the setting of rheumatologic disorders. Three experienced radiologists from different institutions will discuss these various aspects of upper extremity imaging including imaging protocols, normal anatomy and MR appearance of abnormalities.

  Organizers:
  Christine Chung, M.D.
  Lynne S. Steinbach, M.D.

- **Commonly Missed Diagnoses in Shoulder & Knee MR**
  Clinical Intensive Course Option
  *Tuesday, 10 May • Skill Level: Intermediate*
  
  This interactive course will feature an audience response system. The faculty will consist mostly of radiologists with extensive experience in imaging of the musculoskeletal system. The course will cover commonly missed diagnoses in shoulder and knee MR, and will guide the audience through pitfalls in imaging diagnosis. Specific topics in the shoulder will include adhesive capsulitis, synovitis, crystal deposition diseases and early degenerative changes. Specific topics in the knee will include difficult meniscal lesions, synovitis and PVNS and partial tears of the ACL.

  Organizers:
  Christine Chung, M.D.
  Hollis G. Potter, M.D.

- **MSK Tumors & Marrow Evaluation**
  Clinical Intensive Course Option
  *Wednesday, 11 May • Skill Level: Basic–Intermediate*
  
  This two-hour course will discuss two main topics important for clinical MR imaging: characterization of bone and soft tissue tumors as well as an approach to bone marrow evaluation. Two experienced radiologists from different institutions will discuss these various aspects of tumor imaging and marrow evaluation.

  Organizers:
  Christine Chung, M.D.
  Lynne S. Steinbach, M.D.

- **MR Imaging of the Post-Operative Joint**
  Clinical Intensive Course Option
  *Wednesday, 11 May • Skill Level: Intermediate–Advanced*
  
  This two-hour course will focus on cartilage repair, as well as the post-operative shoulder and knee. It will guide the audience through all clinically relevant aspects of postoperative imaging of the musculoskeletal system, including a discussion of imaging protocols, the normal postoperative MR appearance as well as imaging of postoperative complications.

  Organizers:
  Christine Chung, M.D.
  Hollis G. Potter, M.D.
**Advanced Neuroimaging 1**  
**Clinical Intensive Course Option**  
*Saturday, 7 May • Skill Level: Intermediate–Advanced*

In this one-day course, speakers will be both physicians and physicists. The topics to be covered are:
- High field MRI (3T and 7T): patient safety, RF considerations and portability of imaging protocols;
- Nonconventional sequences: perfusion, diffusion and spectroscopy;
- Functional connectivity MRI: underlying neurophysiology and clinical applications;
- Susceptibility-weighted imaging: underlying physics and clinical applications; and
- Non-proton MR: 23Na, 13C MRI and MRS.

The overall goal is to familiarize physicians, physicists and technologists with advanced MR methods. The format will be didactic sessions with time allotted for discussion.

**Organizers:**  
Nicola De Stefano, M.D., Ph.D.  
Marco Essig, M.D., Ph.D.  
Nadine J. Girard, M.D.  
Jeffrey Joseph Neil, M.D., Ph.D.  
Afonso C. Silva, Ph.D.

---

**Advanced Neuroimaging 2**  
**Clinical Intensive Course Option**  
*Sunday, 8 May • Skill Level: Intermediate–Advanced*

In this one-day course, speakers will be both physicians and physicists. The topics to be covered are:
- Pediatric MRI: cerebral malformations, epilepsy and tumors;
- Multiple sclerosis: lesions of white and grey matter;
- Normal appearing brain;
- Dementias: Alzheimer’s disease, HIV and prion disease; and
- Traumatic brain injury: acute evaluation, blast-related injury, application of functional connectivity MRI and DTI.

The overall goal is to familiarize physicians, physicists and technologists with advanced MR methods. The format will be didactic sessions with time allotted for discussion.

**Organizers:**  
Nicola De Stefano, M.D., Ph.D.  
Marco Essig, M.D., Ph.D.  
Nadine J. Girard, M.D.  
Jeffrey Joseph Neil, M.D., Ph.D.  
Afonso C. Silva, Ph.D.

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**Neuro MRI from Start to Finish**  
**Clinical Intensive Course Option**  
*Sunrise Educational Course, Tuesday–Friday, 10-13 May • Skill Level: Intermediate*

This course consists of four one-hour sessions designed to cover clinical issues from fetal MRI through MRI as an autopsy tool. Speakers will be both physicians and physicists, and the principal topics to be covered are:
- Fetal MRI: conventional and non-conventional;
- Neonatal MRI: scanning infants/children without sedation and interpreting MRI studies from infants;
- Adult MRI: with particular attention to pathologic lesions; and
- Forensic MRI: postmortem MRI for autopsy and forensic indications.

The overall goal is to enable the physician to optimize MRI acquisition and interpretation to the age of the patient. The format will be didactic sessions with time allotted for discussion.

**Organizers:**  
Nicola De Stefano, M.D., Ph.D.  
Marco Essig, M.D., Ph.D.  
Nadine J. Girard, M.D.  
Jeffrey Joseph Neil, M.D., Ph.D.  
Afonso C. Silva, Ph.D.
ISMRM EDUCATIONAL COURSE TOPIC:

NEUROIMAGING

(continued on page 25)

Cortical Cartography
Clinical Intensive Course Option
Tuesday, 10 May • Skill Level: Intermediate–Advanced

This 1½-hour course will focus on the fundamentals of measuring cortical folding (cortical cartography). The topics to be covered by our expert speakers are:
• The application of cartography to cortical folding during brain development; and
• The use of cartography to identify aberrant cortical folding in disease.

Organizers:
Pia C. Maly Sundgren, M.D., Ph.D.
Jeffrey Joseph Neil, M.D., Ph.D.

MRI in Drug Abuse
Clinical Intensive Course Option
Tuesday, 10 May • Skill Level: Intermediate

This two-hour course consists of a teaching session covering the use of MR methods to evaluate drug abuse. Speakers will be both physicians and physicists. The principal topics to be covered are:
• Drug exposure in utero: effects of drug abuse on the fetus;
• Cocaine addiction: anatomic and functional MRI finding; and
• MRI of ecstasy addiction.

The overall goal is to familiarize the attendee with MRI findings related to drug abuse. The format will be didactic sessions with time allotted for discussion.

Organizers:
Nicola De Stefano, M.D., Ph.D.
Marco Essig, M.D., Ph.D.
Nadine J. Girard, M.D.
Jeffrey Joseph Neil, M.D., Ph.D.
Afonso C. Silva, Ph.D.

Nouvelle Neuro MR Techniques in Current Clinical Use
Clinical Intensive Course Option
Tuesday, 10 May • Skill Level: Intermediate

This two-hour course will focus on a few of the novel imaging techniques/sequences in current clinical practice, advances and new contrast agents and how to use MRI in prediction models for clinical outcome. Expert speakers will cover:
• SWI and ultra-short T2;
• Imaging at high field;
• New contrast agents; and
• Prediction models in MRI imaging for clinical outcome.

Organizers:
Pia C. Maly Sundgren, M.D., Ph.D.
Jeffrey Joseph Neil, M.D., Ph.D.

MR Spectroscopy in Clinical Use
Clinical Intensive Course Option
Wednesday, 11 May • Skill Level: Intermediate

This two-hour course will focus on clinical MR spectroscopy used to solve problems related to brain tumors, metabolic, and psychiatric disorders. The physician speakers, experts in their field, will cover:
• New advances in MRS;
• MRS in brain tumor diagnosis;
• MRS metabolic disorders; and
• MRS in bipolar disorders.

Organizers:
Pia C. Maly Sundgren, M.D., Ph.D.
Jeffrey Joseph Neil, M.D., Ph.D.
Cortical Cartography
Clinical Intensive Course Option
Tuesday, 10 May • Skill Level: Intermediate–Advanced
This 1¼-hour course will focus on the fundamentals of measuring cortical folding (cortical cartography). The topics to be covered by our expert speakers are:
• The application of cartography to cortical folding during brain development; and
• The use of cartography to identify aberrant cortical folding in disease.
Organizers:
Pia C. Maly Sundgren, M.D., Ph.D.
Jeffrey Joseph Neil, M.D., Ph.D.

MRI in Drug Abuse
Clinical Intensive Course Option
Tuesday, 10 May • Skill Level: Intermediate
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• Drug exposure in utero: effects of drug abuse on the fetus;
• Cocaine addiction: anatomic and functional MRI finding; and
• MRI of ecstasy addiction.
The overall goal is to familiarize the attendee with MRI findings related to drug abuse. The format will be didactic sessions with time allotted for discussion.
Organizers:
Nicola De Stefano, M.D., Ph.D.
Marco Essig, M.D., Ph.D.
Nadine J. Girard, M.D.
Jeffrey Joseph Neil, M.D., Ph.D.
Afonso C. Silva, Ph.D.

Nouvelle Neuro MR Techniques in Current Clinical Use
Clinical Intensive Course Option
Tuesday, 10 May • Skill Level: Intermediate
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• Imaging at high field;
• New contrast agents; and
• Prediction models in MRI imaging for clinical outcome.
Organizers:
Pia C. Maly Sundgren, M.D., Ph.D.
Jeffrey Joseph Neil, M.D., Ph.D.

MR Spectroscopy in Clinical Use
Clinical Intensive Course Option
Wednesday, 11 May • Skill Level: Intermediate
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• New advances in MRS;
• MRS in brain tumor diagnosis;
• MRS metabolic disorders; and
• MRS in bipolar disorders.
Organizers:
Pia C. Maly Sundgren, M.D., Ph.D.
Jeffrey Joseph Neil, M.D., Ph.D.

Combined MRI
Clinical Intensive Course Option
Wednesday, 11 May • Skill Level: Intermediate
This course consists of a two-hour teaching session covering the use of MR in association with PET, high-intensity focused ultrasound (HIFU) and EEG. Speakers will be both physicians and physicists. The principal topics to be covered are combined MRI/PET studies, combined MRI/HIFU studies and combined MRI/EEG, their technical considerations and clinical applications. The overall goal is to familiarize the attendee with the use of MRI with other modalities. The format will be didactic sessions with time allotted for discussion.
Organizers:
Nicola De Stefano, M.D., Ph.D.
Marco Essig, M.D., Ph.D.
Nadine J. Girard, M.D.
Jeffrey Joseph Neil, M.D., Ph.D.
Afonso C. Silva, Ph.D.

Intracranial & Spine Infections
Clinical Intensive Course Option
Wednesday, 11 May • Skill Level: Intermediate
This two-hour course will focus on basic infections in the brain and spine and their MR imaging characteristics. Physicians, well-known and expert in their field, will speak on:
• Changing trends in bacterial agents;
• Prions;
• Tuberculosis; and
• Bacterial infections.
Organizers:
Walter Kucharczyk, M.D., F.R.C.P.C.
Pia C. Maly Sundgren, M.D., Ph.D.
Jeffrey Joseph Neil, M.D., Ph.D.
Majda M. Thurnher, M.D.

Connectivity
Thursday, 12 May • Skill Level: Intermediate–Advanced
This one-hour course will focus on the use of functional MRI to evaluate cerebral circuitry (functional connectivity MRI). Expert speakers will cover:
• The application of functional connectivity MRI to brain development; and
• The use of functional connectivity MRI to disease states.
Organizers:
Pia C. Maly Sundgren, M.D., Ph.D.
Jeffrey Joseph Neil, M.D., Ph.D.
MR Systems Engineering

Saturday, 7 May • Skill Level: Intermediate–Advanced

This one-day course will provide a practical description of fundamental concepts and practices in MR systems engineering. MRI engineers and physicists from industry, academia and clinical environments will speak on the general topics of magnets, gradients, shims, system design, medical device interactions and RF electronics. The overall goal of this program is to enable new researchers to employ more advanced engineering methods in their MRI research.

Organizers:
Blaine A. Chronik, Ph.D.
Greig C. Scott, Ph.D.

MR Physics for Physicists

Saturday, 7 May • Skill Level: Intermediate–Advanced

This one-day course will explore the physical methods and mathematical models that underlie nearly all research and development in MRI and MR spectroscopy. Each lecture will be given by a Ph.D. scientist or engineer who has made significant contributions in their topic area, and who also has a reputation for being a good teacher. Lectures are provided in the general topics of spin physics, equations used to model the imaging process, tissue characterization and mapping of tissue parameters, and imaging with receiver and transmitter arrays. The course will consist of 25-minute lectures, with five-minute discussion periods after each lecture. All speakers will be available for additional questions and discussion during “meet the teachers” breaks in the course.

Organizers:
Michael H. Buonocore, M.D., Ph.D.
Michael Markl, Ph.D.
Andrew G. Webb, Ph.D.

RF Engineering

Sunday, 8 May • Skill Level: Intermediate

In this one-day course we will discuss the principles of RF coils used to detect and excite the MR signals, beginning with the transmission lines that interconnect the coils to the MR system, and extending to single surface and volume coils and finally RF coil arrays for both transmit and receive. Also, the RF modeling tools used to analyze these coils and coil arrays, and their interaction with the patient and the environment. This will lead into a discussion of the interaction of RF fields with other devices that may be found in the MR environment, including such devices as implantable devices and EEG leads. The course will conclude with a live demonstration (or by video and live commentary) of the construction and tuning of RF coils for humans and animals.

Organizers:
Tamer S. Ibrahim, Ph.D.
Andrew G. Webb, Ph.D.
Steven M. Wright, Ph.D.

Imaging Strategies

Sunday, 8 May • Skill Level: Intermediate

This one-day course will cover methods important to people who want to design or understand imaging pulse sequences and reconstruction methods. It is meant to be a complementary course to “MR Physics for Physicists,” which will be held the previous day. Four general topics will be covered:

- General Pulse Sequence Strategies;
- Pulse Sequence Tools;
- Tools for Rapid Imaging; and
- Imaging Beyond Morphology.

Organizers:
Peter Börmert, Ph.D.
Brian A. Hargreaves, Ph.D.
James G. Pipe, Ph.D.
Image Reconstruction

Sunrise Educational Course, Tuesday–Friday, 10-13 May • Skill Level: Intermediate–Advanced

This four-hour course over four mornings will provide an in-depth review of the fundamental concepts common to many image reconstruction problems in MRI. MRI scientists from industry and academia will provide lectures on non-Cartesian image reconstruction, off-resonance correction, parallel imaging with Cartesian and non-Cartesian data sampling, emerging sparse data methods and chemical shift and motion. These courses are intended to introduce new researchers to the advanced algorithms employed in state-of-the-art systems. Each morning the course will be organized as a set of two 25-minute lectures, each with five-minute discussion periods.

What Went Wrong? A Case-Based Approach to MR Image Quality

Thursday, 12 May • Skill Level: Basic

This interactive two-hour course will feature an audience response system. It will address a skill sets gap in identifying and debugging the sources of artifacts in MRI. MRI is a sophisticated technology with a myriad of sources of artifacts, from external interference, and hardware problems, to pulse sequence imperfections and image reconstruction limitations. The course provides an interactive means for rapidly identifying effect and cause of image artifacts.

Visit www.ismrm.org today to learn about the many benefits of ISMRM membership, and then, get even more by spreading the word! Encourage colleagues and friends to join our family of clinicians, physicists, engineers, biochemists and technologists—professionals united by a common interest in the ongoing dialogue between the scientific and clinical communities.

Call +1 510 841 1899 or visit our website www.ismrm.org for more details.

RECRUIT 3 NEW MEMBERS during 2010-2011, and there’s something in it for you—the opportunity to take advantage of ISMRM’s best-in-class scientific and educational offerings. By growing our community with the addition of a Ph.D., M.D. and a student, you will receive a complimentary registration* to a scientific workshop or educational course, including the upcoming workshop in Lake Louise, and the Case-Based MR Clinical Education Series in Miami Beach, Santa Monica and Denver.

ISMRM 1 Ph.D. + 1 M.D. + 1 STUDENT

NOW THAT’S THE POWER OF 3

*New member breakdown must be 1 Ph.D., 1 M.D. & 1 student. This offer only covers a complimentary registration to a scientific workshop or educational course. Housing and meals are not included.
MR Imaging in Brain Tumors

Monday, 9 May • Skill Level: Intermediate

OVERVIEW
This two-hour course will focus on brain tumors, and the speakers are physicians who are expert in their field. This course will cover:

• Cerebral blood flow and permeability in brain tumor;
• Diffusion and diffusion tensor imaging in brain tumor;
• MRI as a biomarker for treatment response; and
• Pseudoprogression, recurrent tumor or radiation injury.

EDUCATIONAL OBJECTIVES
Upon completion of this course, participants should be able to:

• Describe recent developments and the state of the art in MR perfusion and MR diffusion imaging in patients with brain tumors;
• Explain brain plasticity;
• Explain possible use of MRI as a biomarker for treatment response in brain tumors; and
• Compare and contrast imaging in pseudoprogression, recurrent tumor and radiation injury.

Organizers:
Pia C. Maly Sundgren, M.D., Ph.D.
Jeffrey Joseph Neil, M.D., Ph.D.

Speakers:
Thomas L. Chenevert, Ph.D.
Meng Law, M.D.
Pia C. Maly Sundgren, M.D., Ph.D.
Danielle Van Westen, M.D.

Spine & Spinal Cord Imaging

Monday, 9 May • Skill Level: Intermediate

OVERVIEW
This two-hour course will focus on basic clinical spine and spinal cord imaging. The speakers and physicians are experts in the field of spine imaging. This course will cover:

• Trauma to the spine and spinal cord;
• Imaging of the postoperative spine;
• Imaging of common spine and spinal cord tumors; and
• Demyelinating and acute transverse myelitis of the spinal cord.

EDUCATIONAL OBJECTIVES
Upon completion of this course, participants should be able to:

• Image postoperative spine;
• Describe imaging specifics of common spinal and spine cord tumors;
• Describe MRI implications for different injuries of the spine and spinal cord in children and adults; and
• Compare different demyelinating diseases and myelitis of the spinal cord, and the typical MRI imaging findings for each.

Organizers:
Pia C. Maly Sundgren, M.D., Ph.D.
Jeffrey Joseph Neil, M.D., Ph.D.

Speakers:
Mauricio Castillo, M.D.
Massimo Gallucci, M.D.
Diana M. Gomez-Hassan, M.D., Ph.D.
Mario Muto, M.D.
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Mario Muto, M.D.

Thank You
to our corporate sponsors

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<th>Map Code</th>
<th>Hotel Name</th>
<th>Breakfast</th>
<th>Internet</th>
<th>Facilities and Services</th>
<th>In-Room Amenities**</th>
<th>Other Important Information</th>
<th>Deposit: Credit card will be submitted on:</th>
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<td>Le Centre Sheraton Montreal - Headquarters 1201 Rene Levesque West Blvd Montreal, Quebec H3B 2L7 CDN $179 Sgl/Dbl</td>
<td>Daily Charge: $23.00</td>
<td>Lobby*</td>
<td>Free Wireless</td>
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<td>0.10 Mile</td>
<td>7 days prior to arrival date No-show: 1 night room &amp; tax penalty</td>
</tr>
</tbody>
</table>

*Some facilities and services incur additional charges; check Hotel for specific information.
**Some rooms may vary. † Advance arrangements required.
The information contained in this form may be amended from time to time without notice.
### HOTEL INFORMATION

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<th>Map Code</th>
<th>Hotel Name</th>
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<th>In-Room Amenities**</th>
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</tbody>
</table>

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**Some rooms may vary. ‡ Advance arrangements required.

The information contained in this form may be amended from time to time without notice.
STUDENT HOUSING FORM • CONVENTION HOUSING MANAGEMENT

Dear ISMRM Member,

This reservation is made on a best effort basis and availability. After 1 April 2011, Annual Meeting rates may not apply.

1. First Name Last Name
   Institution/Company
   Address
   City State/Province Zip/Postal Code
   Country E-Mail
   Phone Fax

2. Hotel Preference:
   1. 
   2. 
   3. 
   4. 

3. Arrival Date: MM DD YYYY
   Departure Date: MM DD YYYY
   Number of Nights: 
   Room Type:
   S = Single (1 person, 1 bed)
   D = Double (2 people, 1 bed)
   DD = Double/Double (2 beds)

Sharing Party: (Enter full name of sharing party below)
   First Name Last Name

If you require special accommodations or specific aids or services please contact CHM at +1.800.422.8996

IMPORTANT INFORMATION

Deposit Payment Policy: A deposit in CDN Dollars of one night’s room rate plus tax is required to hold your reservation. Payment may be made by credit card, or by wire transfer (contact CHM for Hotel routing number). Before making your selection and booking, please review the hotel deposit and cancellation policies by visiting the ISMRM website: http://www.ismrm.org.

Reservation Changes and Cancellations: Any change in arrival or departure (a partial cancellation), or full cancellation must be made through CHM—the hotels will not accept changes directly—and may result in a penalty. Please be advised if you cancel or change your reservation after the cancellation deadline set by the hotel you will be charged from one night to all nights of stay multiplied by the room rate plus tax.

No-Shows: No refunds will be made for no-shows or early checkouts. If you don’t check-in to the hotel on the first day of your reservation prior to 15:00 EDT (Eastern Daylight Time) and you do not alert the hotel in advance, the hotel will cancel your reservation and charge you a no-show.

Guarantee Policy: By providing the credit card information below, you agree to authorize the hotel to charge your credit card, in the local currency (CDN) at the prevailing exchange rate, in an amount from one night to all nights of your stay, as indicated, based upon the published room rate, plus tax. Before booking, please read the hotel descriptions for the various hotel deposit and cancellation policies.

Card Type: □ Visa □ Mastercard □ American Express □ Diners Club
Credit Card No: 
Expiration Date: 
Cardholder Name: 
Signature: 
Cardholder authorizes the hotel to charge the required amount of deposit for this reservation and any cancellation or change fees that may be incurred. Charges will be in the local currency (CDN Dollars). Other credit card fees and surcharges may apply.

Convention Housing Management
1700 The Alameda, 2nd Floor
San Jose, California 95126
USA
Toll free: +1.800.422.8996 (Toll-free in the U.S. and Canada)
Tel: +1.408.918.4200 (Outside the U.S.)
Fax: +1.408.918.4250
Email: ismrm@chmrooms.com

Reserve accommodations online: http://www.ismrm.org
**Register Online:** [www.ismrm.org/11](http://www.ismrm.org/11)
or Call +1 510 841 1899 for information and details

**Housing Form • Convention Housing Management**

*Book early to ensure the best hotel selection!* Hotel reservations will be assigned on a first-come, first-served basis based on availability. After 1 April 2011, Annual Meeting rates may not apply.

1. **First Name**  [ ]  **Last Name**

   Institution/Company

   Address

   City  [ ]  State/Province  [ ]  Zip/Postal Code

2. **Hotel Preference:**  1.  [ ]  2.  [ ]  3.  [ ]  4.  [ ]

   Arrival Date:  [ ]  Departure Date:  [ ]  Number of Nights:  [ ]  Room Type:  [ ]

   Sharing Party:  [ ]

   First Name  [ ]  Last Name

   Cardholder authorizes the hotel to charge the required amount of deposit for this reservation and any cancellation or change fees that may be incurred. Charges will be in the local currency (CDN Dollars). Other credit card fees and surcharges may apply.

3. **Deposit Payment Policy:** A deposit in CDN Dollars of one night’s room rate plus tax is required to hold your reservation. Payment may be made by credit card, or by wire transfer (contact CHM for Hotel routing number). Before making your selection and booking, please review the hotel deposit and cancellation policies by visiting the ISMRM website: [http://www.ismrm.org](http://www.ismrm.org).

   **Reservation Changes and Cancellations:** Any change in arrival or departure (a partial cancellation), or full cancellation must be made through CHM—the hotels will not accept changes directly—and may result in a penalty. Please be advised if you cancel or change your reservation after the cancellation deadline set by the hotel you will be charged from one night to all nights of stay multiplied by the room rate plus tax.

   **No-Shows:** No refunds will be made for no-shows or early checkouts. If you don’t check-in to the hotel on the first day of your reservation prior to 15:00 EDT (Eastern Daylight Time) and you do not alert the hotel in advance, the hotel will cancel your reservation and charge you a no-show.

4. **Guarantee Policy:** By providing the credit card information below, you agree to authorize the hotel to charge your credit card, in the local currency (CDN) at the prevailing exchange rate, in an amount from one night to all nights of your stay, as indicated, based upon the published room rate, plus tax. Before booking, please read the hotel descriptions for the various hotel deposit and cancellation policies.

   **Card Type:**  [ ] Visa  [ ] Mastercard  [ ] American Express  [ ] Diners Club

   **Credit Card No.:**  [ ]  [ ]  [ ]  [ ]  [ ]  [ ]  [ ]  [ ]  [ ]  [ ]  [ ]

   **Expiration Date:**  [ ]  [ ]

   **Cardholder Name:**  [ ]  [ ]  [ ]  [ ]  [ ]

   **Signature:**  [ ]  [ ]  [ ]  [ ]  [ ]

   Cardholder authorizes the hotel to charge the required amount of deposit for this reservation and any cancellation or change fees that may be incurred. Charges will be in the local currency (CDN Dollars). Other credit card fees and surcharges may apply.

   Convention Housing Management
   1700 The Alameda, 2nd Floor
   San Jose, California 95126
   USA

   Toll free:  +1.800.422.8996 (Toll-free in the U.S. and Canada)
   Tel:  +1.408.918.4200 (Outside the U.S.)
   Fax:  +1.408.918.4250
   Email:  ismrm@chmrooms.com

   Reserve accommodations online: [http://www.ismrm.org](http://www.ismrm.org)
Bonjour MONTRÉAL

Montréal has a unique mix of historical, natural and cultural offerings to satisfy even the most diverse individual travelers. Attractions are both dazzling and fascinating to satisfy those who enjoy outdoor action, sports and recreation, sightseeing, history, professional shopping, cultural and natural sites or simply the celebration of life itself!

Climate: May and October are arguably the most pleasant months for outdoor activities and walking in Montréal. Please visit: www.theweathernetwork.com.

Telephones: The island of Montréal uses the 514 area code. A local call from a phone booth costs $.50.

Currency: The unit of currency is the Canadian dollar. Coins are in denominations of $.01, $.05, $.10 $.25, $1.00 (a large gold-colored coin) and $2.00 (a large bimetallic coin). Bills in $5.00 (blue), $10.00 (purple) and $20.00 (green) are in common circulation. You can get $50.00 (red) and $100.00 (brown) from banks, though not from most automatic teller machines (ATMs). Downtown stores are usually happy to accept U.S. currency. Major travellers’ cheques are accepted in places that accept credit cards, but are not universally accepted as cash. Most stores and restaurants accept Visa and MasterCard and some accept American Express.

Currency Exchange: There are many currency exchange centers throughout the downtown area and at the airport.

Taxes: Most goods and services in Québec are subject to two taxes, a federal Goods and Services Tax of 5% (usually listed as TPS on receipts – Taxe sur les produits et services) and a provincial sales tax of 7.5% (TVQ on receipts – Taxe de vente du Québec). A tax of 3% per night of hotel stay is also charged.

Tipping: A tip of 15% is customarily left for waiters and waitresses at the table, calculated on the pre-tax total of your bill.

Customs & Immigration: Visitors need a valid passport to enter Canada. They may also require a visa. For information, check with Citizenship and Immigration Canada. The Canadian government has a useful website (www.cic.gc.ca/english/visit/visas.asp) and pages with further tips for foreigners visiting Canada. This government web site lists countries requiring visas, and those that do not require visas; how to apply, what is required, checking on your application, visa letters, etc.

Duty Free: Please check the Canada Border Services Agency (www.cbsa-asfc.ca/noncan-eng.html) for current duty-free regulations.

Getting Into & Out of Montréal: Airport: Pierre Elliott Trudeau International (also known as Dorval) is 22 km west of downtown and now serves all domestic, U.S. and international passenger flights.

Airport Transportation: A taxi ride from the downtown area to Trudeau Airport costs a flat rate of $38.00 at time of writing. A new public airport shuttle, the 747, runs all hours from several anchor points in the downtown area out to the airport. Ordinary tickets, passes and cash fare of $7 should be accepted. For more information on all services offered at Pierre Elliott Trudeau International Airport, please visit www.admtl.com/Passengers/Home.aspx.

Trains: Montréal is on Via Rail’s Windsor-Québec corridor. Amtrak runs the Adirondack from Montréal to New York daily and this is the only train connection from Montréal to the United States. There are two major downtown train stations, Central Station (Gare Centrale) and Windsor/L’Allier. Both are connected to the Bonaventure Metro station and are thus connected to the underground city.

Time Zone: Montréal is in the Eastern time zone of North America and observes Daylight Savings Time.

Electricity: Electricity in Canada is 110V; plugs are the same as in the U.S. If your device uses 220V electricity, please bring a converter.

Weights & Measures: Canada is metric. Temperatures are given in celsius and road distances and speed limits are in kilometres: cars are calibrated in km.

Language: Québec’s language laws impose restrictions on outdoor signs in languages other than French. In the parts of Montréal where most travellers go, services are available in English as well as in French.

Health & Safety: Ambulance, fire, police, health emergencies: dial 911. It is advised that you get travellers’ insurance before leaving home because healthcare is not free for visitors.
Medications: Bring any medications you need with you, especially sufficient quantities of prescription medicines. These should be kept in their original containers to avoid difficulties at borders. You do not need any special immunizations to visit Canada and you do not need to drink bottled water while here.

Driving: Distances and speed limits are posted in kilometres throughout Canada. Roughly, 60 mph equals 100 kmh. Gasoline prices are in litres. You may not turn right on red lights in Montréal. Seatbelts are mandatory even in back seats. Helmets are required for motorcyclists. It is obligatory to stop when a school bus is stopping, regardless of the direction in which you are driving. On a few major streets, bus lanes are marked with a large white diamond shape and you should not use and absolutely must not stop or park in these lanes within the hours noted on the accompanying signs. Some streets have bike lanes: these will be marked.

Drinking: The legal drinking age in Québec is 18 years old.

City Police: Police patrol in blue and white cars. Parking infractions are monitored by city employees in reddish-orange cars. Because parking can be so difficult, sightseeing on foot and by Metro is encouraged.

Public Transit: Montréal has an excellent public transit system. Metro lines shut down around 12:30 a.m., after which the whole system shifts over to night bus lines until around 5:30 a.m. A single fare is $2.75, or $9.00 per day unlimited travel. For tourists a special card giving full access for three days costs $17.

Bicycles: Helmets are not mandatory for cyclists in Montréal. Montréal uses “the Bixi,” a system of short-term rental bicycles. These beautifully designed, adjustable and comfortable three-speed aluminum bicycles have been adopted by locals and tourists alike. The fare structure is geared toward short-term use. There are several iPhone apps that track Bixi availability in real time.
Clinical Needs & Research Promises: Bridging the Gap

SMRT 20th Annual Meeting: Celebrating 20 Years of MR Educational Excellence

The Program and Education Committees would like to invite technologists/radiographers from around the world to attend the 20th Annual Meeting of the Section for Magnetic Resonance Technologists to be held on 7–8 May 2011 in conjunction with the ISMRM Annual Meeting. The SMRT Annual Meeting, which will be held in Montréal, Québec, Canada, will once again provide quality educational opportunities for MR technologists/radiographers with the goal of maintaining a high level of professionalism in the field.

The Annual Meeting will begin Friday evening, 6 May 2011, with the Poster Presentation Reception and a special presentation bringing us back to the humble beginnings of NMR through the present day MR imaging. In addition to the Friday evening presentations, there will be Proffered Paper Presentations on 7 and 8 May. We encourage technologists and radiographers to share their work through the submission of abstracts for oral or poster presentation. Abstracts with either a clinical practice focus or research focus will be accepted until 16 December 2010. Online abstract submission instructions and applications are available on the SMRT website: www.ismrm.org/smrt.

The forums of this year’s meeting were selected based on feedback from previous meetings and will include a wide range of MR imaging topics. The forums will include topics such as MR physics and technology, safety updates and information, neurological and cardiac imaging topics, body imaging to include prostate imaging and the challenges of 3T body imaging. Additional forums include the topics of MSK imaging, 7 Tesla imaging, practical applications of spectroscopy and emerging technologies such as MRI guided focused ultrasound. Attendees are also encouraged to attend the SMRT Business Meeting held on Saturday, 7 May. The Meeting is an open session with the intent of informing SMRT members of the current mission, goals and activities of the Section. The attendance and contribution of SMRT members is invaluable to the growth and evolution of the SMRT as a global resource of MR education. On Sunday, 8 May, the Presentation of Awards will take place. All SMRT Awards are presented during this time and all are encouraged to attend in support of those technologists and radiographers who have participated in fulfilling the SMRT’s commitment to excellence in MR education. Finally, please note the ISMRM/SMRT Joint Forum will be held Monday, 9 May 2011. Your SMRT meeting registration includes this forum which is a collaboration of energy and talent between the SMRT and ISMRM. The organizers of this year’s forum are Gareth Barker, Ph.D., Margaret Hall-Craggs, M.D., Derek Jones, Ph.D. and Michael Macilquham, B.App.Sc., M.H.Sc. (MRI). The forum topic is DTI which promises to provide the highest quality of MR education. Be sure to extend your stay and attend this exciting Joint Forum (see page 17). The SMRT Annual Meeting program has been approved for 14.50 Category A CE credits, United Kingdom - College of Radiographers (CPD Now) and the Australia Institute of Radiology (AIR) CPD activity credits. Technologists and radiographers can also earn additional Category A CE credits at many of the ISMRM 19th Annual Meeting & Exhibition educational courses held Monday through Friday.

The SMRT was established to provide superior educational opportunities for technologists/radiographers, as well as a forum for collaboration. The 2011 Annual Meeting is dedicated to continuing this tradition. On behalf of the 2011 Program and Education Committees, we are pleased to invite you to join us in Canada for the 20th Annual SMRT Meeting in Celebrating 20 Years of MR Educational Excellence.

SMRT Officers
Julia B. Lowe, B.S., R.T. (R)(MR) FSMRT President
Charles T. Stanley, R.T. (R)(CT)(MR) President Elect, Co-Chair, Executive Liaison-External Relations
Pamela S. Vincent, M.PA, R.T. (R)(M)(CT)(MR) Past President
Vera Miller, B.S., R.T. Secretary
Steven P. Shannon, B.S., R.T. (R)(MR) Treasurer
Michael D. Macilquham, B.App.Sc., M.H.Sc (MRI), Executive Member
Gina M. Greenwood, MBA, R.T. (R)(MR) FSMRT Co-Chair, Executive Liaison-External Relations

SMRT Policy Board
Heidi Berns, M.S., R.T. (R)(MR) FSMRT (ex officio)
Maryann Blaine, MAT, B.S., R.T. (R)(MR)
Joseph Castillo, B.Sc. (Hons), M.Sc. (MRI)
Muriel Cockburn, D.C.R., B.Sc. (Hons)
Colleen A. Hammond, R.T. (R)(MR)
Ben Kennedy, B.App.Sc. (MIT) MMRT
Carol Lee, B.S., R.T. (R)(CT)(MR)
Titti Owman, R.T. (R)(CT)(MR)
Mercedes Pereyra, MBA, B.S., R.T. (R)(CT)(MR)
Barry Southers, BRST, R.T. (R)(MR)
John J. Totman, M.Sc., D.C.R. (R)
Anne Sawyer, B.S., R.T. (R)(MR) FSMRT (ex officio)
Julie Strandt-Peay, B.S.M., R.T. (R)(MR) FSMRT (ex officio)

SAVE ON REGISTRATION FEES
WHEN YOU BECOME AN SMRT MEMBER
SMRT 20th Annual Meeting:
Celebrating 20 Years of MR Educational Excellence

PROGRAM

7–8 May 2011, Montréal, Québec, Canada

SMRT Poster Reception and Special MR History Presentation Friday, 6 May 2011, 18:00-20:00

<table>
<thead>
<tr>
<th>Time</th>
<th>Saturday, 7 May 2011 • 07:45–17:00</th>
</tr>
</thead>
<tbody>
<tr>
<td>06:30</td>
<td>Registration</td>
</tr>
<tr>
<td>07:45</td>
<td>Welcome &amp; Announcements</td>
</tr>
<tr>
<td></td>
<td>Julia B. Lowe, B.S., R.T. (R)(MR)</td>
</tr>
<tr>
<td></td>
<td>SMRT President 2010-2011</td>
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<tr>
<td></td>
<td>Carol Lee, B.S., R.T. (R)(CT)(MR)</td>
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<tr>
<td></td>
<td>SMRT Program Chair 2010-2011</td>
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<tr>
<td>08:00</td>
<td>Challenges in Setting up Cardiac Services</td>
</tr>
<tr>
<td></td>
<td>Cindy R. Comeau, B.S., R.T. (N)(MR) FSMRT</td>
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<tr>
<td>08:40</td>
<td>Cardiovascular MR: Physics &amp; Applications</td>
</tr>
<tr>
<td></td>
<td>Gerhard Laub, Ph.D.</td>
</tr>
<tr>
<td>09:20</td>
<td>Clinical Cardiovascular MRI</td>
</tr>
<tr>
<td></td>
<td>J. Paul Finn, M.D., Ph.D.</td>
</tr>
<tr>
<td>10:00</td>
<td>Break</td>
</tr>
<tr>
<td>10:20</td>
<td>Tips for Scanning Children</td>
</tr>
<tr>
<td>10:50</td>
<td>Body &amp; Cardiac MR at 7T</td>
</tr>
<tr>
<td></td>
<td>Thoralf Niendorf, Ph.D.</td>
</tr>
<tr>
<td>11:20</td>
<td>SMRT Annual Business Meeting</td>
</tr>
<tr>
<td>12:00</td>
<td>Lunch</td>
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<tr>
<td>12:45</td>
<td>Proffered Papers/President’s Award Paper</td>
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<tr>
<td></td>
<td>Moderator: Barry Southers, BRST, R.T. (R)(MR)</td>
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<tr>
<td>13:00</td>
<td>Proffered Papers/President’s Award Paper</td>
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<tr>
<td>13:30</td>
<td>SMRT Awards Presentation</td>
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<tr>
<td>13:45</td>
<td>Practical Approach to MR Spectroscopy</td>
</tr>
<tr>
<td></td>
<td>Anna Simeonov, M.Sc., R.T. (R)(MR)</td>
</tr>
<tr>
<td>14:15</td>
<td>MRI Guided Focused Ultrasound</td>
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<tr>
<td></td>
<td>Charles T. Stanley, R.T. (R)(CT)(MR)</td>
</tr>
<tr>
<td>14:45</td>
<td>Break</td>
</tr>
<tr>
<td>15:00</td>
<td>Historical View of the Fundamental Physics of MR</td>
</tr>
<tr>
<td></td>
<td>Peter Morris, Ph.D., M.A.</td>
</tr>
<tr>
<td>15:40</td>
<td>Physics: Advanced Sequences</td>
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<tr>
<td></td>
<td>William Faulkner, B.S., R.T. (R)(MR)(CT) FSMRT</td>
</tr>
<tr>
<td>16:20</td>
<td>Artifacts</td>
</tr>
<tr>
<td></td>
<td>Robert V. Mulkern, Jr., Ph.D.</td>
</tr>
<tr>
<td>17:00</td>
<td>Announcements/Close</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Sunday, 8 May 2011 • 07:45-17:00</th>
</tr>
</thead>
<tbody>
<tr>
<td>07:00</td>
<td>Registration</td>
</tr>
<tr>
<td>07:45</td>
<td>Welcome &amp; Announcements</td>
</tr>
<tr>
<td></td>
<td>Charles T. Stanley, R.T. (R)(CT)(MR)</td>
</tr>
<tr>
<td></td>
<td>SMRT President 2011-2012</td>
</tr>
<tr>
<td></td>
<td>Carol Lee, B.S., R.T. (R)(CT)(MR)</td>
</tr>
<tr>
<td></td>
<td>SMRT Program Chair 2010-2011</td>
</tr>
<tr>
<td>08:00</td>
<td>Spinal Tumours</td>
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<tr>
<td></td>
<td>Raquel del Carpio-O’Donovan, M.D.</td>
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<tr>
<td>08:40</td>
<td>Advanced Neuro Imaging</td>
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<td></td>
<td>Max Wintemark, M.D.</td>
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<tr>
<td>09:30</td>
<td>Clinical fMRI</td>
</tr>
<tr>
<td></td>
<td>Stephen E. Jones, Ph.D.</td>
</tr>
<tr>
<td>10:00</td>
<td>Break</td>
</tr>
<tr>
<td>10:20</td>
<td>Optimal Body MRI/MRA Imaging</td>
</tr>
<tr>
<td></td>
<td>Bobbie Burrow, R.T. (R)(CT)(MR)</td>
</tr>
<tr>
<td>11:00</td>
<td>Optimal MR Body Imaging Diagnosis</td>
</tr>
<tr>
<td></td>
<td>Diego Martin, M.D., Ph.D., P.R.C.P.</td>
</tr>
<tr>
<td>11:40</td>
<td>Prostate Imaging &amp; Spectroscopy</td>
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<td></td>
<td>Jurgen J. Fütterer, M.D., Ph.D.</td>
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<tr>
<td>12:20</td>
<td>Lunch</td>
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<tr>
<td>13:00</td>
<td>Proffered Papers</td>
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<tr>
<td>13:30</td>
<td>SMRT Awards Presentation</td>
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<tr>
<td>13:45</td>
<td>Hip MRI to Include FAI</td>
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<tr>
<td></td>
<td>James M. Linklater, M.D., M.B.B.S.</td>
</tr>
<tr>
<td>14:15</td>
<td>MRI Evaluation of the Athlete</td>
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<tr>
<td></td>
<td>Mark Schweitzer, M.D.</td>
</tr>
<tr>
<td>14:45</td>
<td>Break</td>
</tr>
<tr>
<td>15:00</td>
<td>MR Conditional Pacemakers</td>
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<tr>
<td></td>
<td>Emanuel Kanal, M.D., F.A.C.R.</td>
</tr>
<tr>
<td>15:30</td>
<td>NSF Update &amp; New Guidelines</td>
</tr>
<tr>
<td></td>
<td>Emanuel Kanal, M.D., F.A.C.R.</td>
</tr>
<tr>
<td>16:10</td>
<td>Making Your MRI Department Safe</td>
</tr>
<tr>
<td></td>
<td>Anne Marie Sawyer, B.S., R.T. (R)(MR) FSMRT</td>
</tr>
<tr>
<td>17:00</td>
<td>Announcements/Adjourn</td>
</tr>
</tbody>
</table>
The International Society for Magnetic Resonance in Medicine is an international, nonprofit, scientific association whose purpose is to promote communication, research, development and applications in the field of magnetic resonance in medicine and biology. We are a multidisciplinary community of over 8,000, consisting of clinicians, physicists, engineers, biochemists and technologists—professionals united by a common interest in the ongoing dialogue between the scientific and clinical communities. In addition to its large annual meeting, the Society holds scientific workshops and educational courses, as well as publishes two journals, *Magnetic Resonance in Medicine* and the *Journal of Magnetic Resonance Imaging*. It also sponsors study groups on specific areas of scientific interest and chapters based on geographical location.
STEP I: MEETING BADGE INFORMATION

Meeting materials will NOT be mailed.
Badges and materials will be available at the registration desk in Montréal.

Honorific and gender: ☐ M.D. ☐ M.D. Candidate ☐ Ph.D. ☐ Ph.D. Candidate ☐ Prof. ☐ R.T. ☐ Other: _______ ☐ Male ☐ Female
Family Name: ______________________ First/Given Name: ______________________ Middle Name: ______________________
Institution: ______________________ City: ______________________ State/Province: ______________________ Country: ______________________

STEP II: REGISTER ONLINE:
WWW.ISMRRM.ORG/11
or Call +1 510 841 1899 for information and details

Check enclosed (personal, bank, institution) made payable to ISMRM or International Society for Magnetic Resonance in Medicine

Credit Card Please charge registration fees to my:
☐ VISA ☐ AMEX ☐ MasterCard

Cardholder’s Name (please print clearly): ______________________
Billing Street Address (required): ______________________
Postal Code (required): ______________________

STEP III: STUDENT VERIFICATION*

*Required for all students, post docs, and technologists who are registering as non-members

Supervisor’s Name: ______________________ Institution Name: ______________________
Supervisor’s Phone: ______________________ Supervisor’s E-mail: ______________________

STEP IV: ATTENDANCE INFORMATION

☐ I have a disability & require assistance ☐ Send me an invitation letter for the purpose of obtaining a visa.

STEP V: PROGRAM OPTIONS AND FEES

(Please check one box below). We welcome ASNR Members to register at the ISMRM member rates

<table>
<thead>
<tr>
<th>Program Options</th>
<th>ISMRM Member Fee</th>
<th>ISMRM Non-Member Fee</th>
<th>ISMRM Student Member Fee</th>
<th>Student Non-Member Fee</th>
<th>SMRT Member Fee</th>
<th>Non-Member Fee</th>
</tr>
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<tbody>
<tr>
<td>SMRT Annual Meeting, 7–8 May 2011</td>
<td>☐ US$260</td>
<td>☐ US$360</td>
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<tr>
<td>After 31 March</td>
<td>☐ US$260</td>
<td>☐ US$360</td>
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<tr>
<td>SMRT Annual Meeting &amp; ISMRM Annual Meeting, 7–13 May 2011</td>
<td>☐ US$480</td>
<td>☐ US$675</td>
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<tr>
<td>After 31 March</td>
<td>☐ US$480</td>
<td>☐ US$675</td>
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</tbody>
</table>

STEP VI: PRINTED PROGRAM BOOK OPTION
(Back by popular demand with a few changes suggested by last year’s registrants.) Your registration fee includes an electronic version of the program book, an enhanced itinerary builder, a few mobile applications, and a small program-at-a-glance. If you prefer a printed program book, you must pre-order it here. A nominal fee is required to cover production and freight costs.

☐ I am adding US $25 to my registration fee for a printed program book. My total registration fee is US $ _______

STEP VII: PAYMENT OPTIONS
(Fees are shown, and must be paid, in US dollars)

☐ Check enclosed (personal, bank, institution) made payable to ISMRM or International Society for Magnetic Resonance in Medicine

☐ Credit Card Please charge registration fees to my: ☐ VISA ☐ AMEX ☐ MasterCard

Cardholder’s Name (please print clearly): ____________________________________________
Expiration Date: _______ / _______
Billing Street Address (required): _________________________________________________
Postal Code (required): ______________________

Refunds/Cancellations: A refund of the registration fee will be made for any program when a written request is received in the ISMRM office on or before 21 April 2011.
IMPORTANT MEETING DATES AND DEADLINES

16 December 2010, 23:59 EST  Deadline for receipt of abstracts for the SMRT 20th Annual Meeting
31 March 2011, 23:59 EST  Deadline for advanced registration for the ISMRM 19th Annual Meeting & Exhibition (See page 39)
1 April 2011, 23:59 EST  Deadline for housing reservations (See pages 30-33)
22 April 2011  Proceedings & Educational Syllabus available online to pre-registered attendees only
7–8 May 2011  SMRT 20th Annual Meeting
7–13 May 2011  ISMRM 19th Annual Meeting & Exhibition