program book

HBM2010
BARCELONA, SPAIN

16th Annual Meeting of the Organization for Human Brain Mapping

June 6-10, 2010 • Catalonia Palace of Congresses

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Organization for Human Brain Mapping

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program at a glance

Sunday, June 6

ALL DAY EDUCATIONAL COURSES

Introduction to Imaging Genetics
8:00 - 17:00
Sala H2

Dynamic Models in Systems Neuroscience
8:00 - 18:00
Sala H1

EEG/MEG: Practical Tools for Advanced Analysis
8:00 - 17:00
Sala H3

Multimodal Neuroimaging: Examples, Benefits and Challenges
8:00 - 17:00
Sala A

Diffusion and Structural MRI
8:15 - 17:00
Sala J

Advanced fMRI
8:30 - 17:30
Sala F

Opening Ceremonies and Talairach Lecture
18:00 - 19:30
Oscillation-Assisted Internally Generated Cell Assembly Sequences Support Cognition
György Buzsáki
Auditorium

Welcome Reception
19:30 - 21:30
The Gardens

Monday, June 7

Morning Workshops
9:00 - 10:15

Why Should I Believe Your Model? How to be a Sceptical Neuroimager
H1 & 2

Cut the Edge of NIRS/OT Technique Toward Synthesis for the Next Generation
J & H3

Art and the Brain: Perception and Aesthetics of Paintings & Music
Auditorium

LOC Symposium
10:30 - 12:00
The Legacy of Ramon y Cajal from Brain Structure to Cognitive Function: The Spanish School Version
Auditorium

Keynote Lecture
12:00 - 12:30
From Monkey to Human and From Human to Monkey: What Do We Learn?
Wim Vanduffel
Auditorium

Poster Session *(Odd numbered posters present)*
12:30 - 13:30
Exhibit Hall and Multifunction Area

Lunch
13:30 - 14:45

Poster Session *(Even numbered posters present)*
14:45 - 15:45
Exhibit Hall and Multifunction Area

Symposium
16:00 - 17:15
Decoding Information Conveyed by Cortical Columns: Mechanisms & Advanced Methods for Investing Higher-Order Cognitive Functions
Auditorium

Keynote Lecture
17:15 - 17:45
Decoding Memories
Eleanor Maguire
Auditorium

Oral Sessions
18:00 - 19:15

O-M1: Memory and Learning
J & H3

O-M2: Modeling and Analysis: Brain Networks I
H1 & 2

O-M3: Disorders of the Nervous System: Psychiatry
Auditorium

Tuesday, June 8

Morning Workshops
9:00 - 10:15

Retinotopic Mapping: Techniques, Current Concepts & Research Trends
H1 & 2

Human Intra-Cranial Elecriophysiology (ICE) in Mind/Brain Mapping-Linking Levels of Analysis from Cells to Psychology
J & H3

Connectivity in the Developing Brain
Auditorium

Oral Sessions
10:30 - 11:45

O-T1: Imaging Techniques: Structural Connectivity
J & H3

O-T2: How Genes Map the Brain
H1 & 2

O-T3: Language
Auditorium

Keynote Lecture
12:00 - 12:30
Psychiatric Neuroimaging: From Maps to Mechanisms
Andreas Meyer-Lindenberg
Auditorium

Poster Session *(Odd numbered posters present)*
12:30 - 13:30
Exhibit Hall and Multifunction Area

Lunch
13:30 - 14:45

Poster Session *(Even numbered posters present)*
14:45 - 15:45
Exhibit Hall and Multifunction Area

Symposium
16:00 - 17:15
The Dopamine Midbrain
Auditorium

Keynote Lecture
17:15 - 17:45
The Brain's Default Network
Randy Buckner
Auditorium

Oral Sessions
18:00 - 19:15

O-T4: Emotion and Motivation 1: Reward, Decision Making, and Learning
Auditorium

O-T5: Cognition and Attention: Brain Plasticity and Aging
H1 & H2

O-T6: Imaging Techniques: Functional MRI
J & H3

Poster Reception
19:30 - 20:30
Exhibit Hall and Multifunction Area

Wednesday, June 9

Morning Workshops
9:00 - 10:15

Data-Driven Mapping of Functional Architecture & Functional Ontologies
Auditorium

Multi-Subject Surface-Based Analysis of fMRI Data: Challenges, Solutions & Limitations
H1 & 2

Gene Function Meets Brain Function
J & H3

Oral Sessions
10:30 - 11:45

O-W1: Cognition and Attention: Perception, Attention & Imagery I
Auditorium

O-W2: Disorders of the Nervous System: Neurology
H1 & 2

O-W3: Brain Development
B1 & 2

O-W4: Imaging Techniques: Multimodal Approaches
J & H3

Keynote Lecture
12:00 - 12:30
Using fMRI to Detect Conscious Awareness
Adrian Owen
Auditorium

Poster Session *(Odd numbered posters present)*
12:30 - 13:30
Exhibit Hall and Multifunction Area

Lunch
13:30 - 14:45

Poster Session *(Even numbered posters present)*
14:45 - 15:45
Exhibit Hall and Multifunction Area

Symposium
16:00 - 17:15
Top-Down Modulation in Visual Processing
Auditorium

Town Hall Meeting
17:15 - 17:45
Auditorium

Keynote Lecture
17:45 - 18:15
Electrophysiological Imaging of the Attention Network
Pascal Fries
Auditorium

Oral Sessions
18:30 - 19:45

O-W5: Emotion and Motivation 2: Pharmacology and Neurotransmitters
J & H3

O-W6: Modeling and Analysis: Brain Networks II
H1 & 2

O-W7: Cognition and Attention: Perception, Attention and Imagery II
Auditorium

Club Night: Razzmatazz Nightclub
21:00 - 1:00

Thursday, June 10

Morning Workshops
9:00 - 10:15

Measuring Consciousness in Disorders of Connectivity
H1 & 2

fMRI in Clinical Trials: Promise, Progress and Path Forward
J & H3

Prospects for Noninvasive Microstructural Parcellation of Human Cortex: The Challenge of an In Vivo Brodmann Atlas
Auditorium

Oral Sessions
10:30 - 11:45

O-Th1: Motor Behavior
Auditorium

O-Th2: Brain Structure and Anatomy
J & H3

O-Th3: Disorders of the Nervous System: Development
H1 & 2

Keynote Lecture
12:00 - 12:30
Real Time Functional Connectivity Assessed Using Transcranial Magnetic Stimulation (TMS) Methods
John Rothwell
Auditorium

Poster Session *(Odd numbered posters present)*
12:30 - 13:30
Exhibit Hall and Multifunction Area

Lunch
13:30 - 14:45

Poster Session *(Even numbered posters present)*
14:45 - 15:45
Exhibit Hall and Multifunction Area

Oral Sessions
16:00 - 17:15

O-Th4: Brain Stimulation
J & H3

O-Th5: Sensory Systems
Auditorium

O-Th6: Modeling and Analysis: Anatomy & Inter-Subject Variability
H1 & 2

Closing Comments and Meeting Highlights
17:30 - 18:30
Auditorium

Farewell Poster Reception
18:30 - 19:30
Exhibit Hall and Multifunction Area

welcome remarks

WELCOME TO THE 16TH ANNUAL MEETING OF THE ORGANIZATION FOR HUMAN BRAIN MAPPING IN BARCELONA, SPAIN. This year, the traditional OHBM combination of exciting scientific programs and social events combines with the exciting atmosphere that can only be created by the city of Barcelona. Barcelona, the capital of Catalonia, is one of the most popular tourist destinations in Europe. The city, on the Mediterranean coast, has a wealth of unique historic and modern architecture. The modernist movement, with Antoní Gaudi as its most prominent member, left its mark on the city with magnificent buildings such as la Sagrada Familia, Casa Milà and Casa Batlló. It is a beautiful city full of markets, shops, museums and churches, and attendees will find it a wonderful city to explore.

This year's program features the Talairach Lecture given by Gyorgy Buzsaki of Rutgers University, Newark, NJ, and Keynote Lectures by Wim Vanduffel, Eleanor Maguire, Andreas Meyer-Lindenberg, Randy Buckner, Adrian Owen, Pascal Fries, and John Rothwell.

Over 3000 posters will be presented throughout the meeting. There will be two 60-minute poster sessions Monday through Thursday, with each poster being displayed for two full days. The morning poster session will be from 12:30-13:30, and the afternoon session will be from 14:45-15:45. Tuesday and Thursday will conclude with a 60-minute poster reception, where authors from both of the day's sessions will be present to answer questions.

A Board of Councilors, elected by the membership, governs the OHBM and will be present at this year's meeting. We welcome and encourage those researchers who are attending this meeting for the first time, and are not yet members, to join the organization and to participate in its future growth. One characteristic of the organization is that the leadership feels it is essential to include a broad base of members in order to achieve its scientific goals. This year's meeting reflects this philosophy by including member-proposed workshops and three member-initiated symposia.

Please be sure to visit the exhibit booths located in the Exhibit Hall (Level 0), and thank the representatives for their support of the OHBM meeting.

The annual meeting will feature parallel oral sessions that will allow for more discussion of original work, and encourage the participation of younger investigators. In addition, three morning workshop sessions will be presented from 9:00 – 10:15 from Monday through Thursday. On Sunday, six full-day educational courses will also be offered:

- Introduction to Imaging Genetics
- Computational Neuroscience & Modeling of Neurodynamics
- EEG/MEG: Practical Tools for Advanced Analysis
- Multimodal Neuroimaging
- Diffusion & Structural MRI
- Advanced fMRI

The 16th Annual Meeting of the Organization for Human Brain Mapping promises to be a memorable event from both a scientific and social perspective. We are glad you have joined us and look forward to your involvement.

Sincerely,

Russ Poldrack
Chair, OHBM Council

Denis Le Bihan
Chair, OHBM Program Committee

Emiliano Ricciardi
Jean-Baptiste Poline
Co-Chairs, Local Organizing Committee

general information

CONFERENCE VENUE

Catalonia Palace of Congresses
Av. Diagonal, 661-671, 08028
Barcelona, Spain
Phone: +34 933 644 400
Fax: +34 933 644 401
All events will take place in the Catalonia Palace of Congresses, unless otherwise noted.

REGISTRATION HOURS

Registration Area (Level 0)

Saturday, June 5:	15:00 – 18:00
Sunday, June 6:	7:30 – 19:30
Monday, June 7:	8:30 – 19:30
Tuesday, June 8:	8:30 – 19:30
Wednesday, June 9:	8:30 – 20:00
Thursday, June 10:	8:30 – 18:30

EXHIBIT HOURS

Exhibit Hall (Level 0)

Monday, June 7:	12:30 – 18:00
Tuesday, June 8:	12:30 – 20:30
Wednesday, June 9:	12:30 – 18:30
Thursday, June 10:	12:30 – 19:30

TOWN HALL MEETING

Wednesday, June 9, 17:15 – 17:45
Auditorium (Level 0)
All OHBM meeting attendees are encouraged to participate in this open forum where you will have an opportunity to ask questions and give the OHBM leadership feedback. Updates on future meeting sites and council elections will be presented.

WELCOME RECEPTION

Sunday, June 6, 19:30 – 21:30
The Gardens
Join us for hors d'oeuvres and a selection of local wines and beers at the Welcome Reception. The reception will be held in the Historic Gardens of Hotel Rey Juan Carlos I, immediately following the Opening Ceremonies and Talairach Lecture on Sunday, June 6. The party is complimentary to registrants, but a ticket must be requested upon registration. Additional guest tickets are 50€.

CLUB NIGHT

Wednesday, June 9, 21:00 – 1:00
Razzmatazz Nightclub
Almogàvers 122
Barcelona, Spain 08018
Spend an evening at Razzmatazz, Barcelona's famous nightclub. Razzmatazz is a multi-floored discoteque and concert venue, where all of the hippest acts in Europe and the US have played at some point. Entertainment will feature live music by Mother Groove as well as a DJ. Club Night is complimentary to registrants, but a ticket must be requested upon registration. Additional guest tickets are 50€.

SPEAKER READY ROOM

Press Room 2 (Level 1)
Hours:

Saturday, June 5:	15:00 – 18:00
Sunday, June 6:	7:30 – 19:30
Monday, June 7:	8:30 – 19:30
Tuesday, June 8:	8:30 – 19:30
Wednesday, June 9:	8:30 – 19:30
Thursday, June 10:	8:30 – 17:00

INTERNET CAFE

Foyer (Level 0)
A limited number of complimentary terminals will be available.
Hours:

Sunday, June 6:	7:30 – 19:30
Monday, June 7:	8:30 – 19:30
Tuesday, June 8:	8:30 – 19:30
Wednesday, June 9:	8:30 – 19:30
Thursday, June 10:	8:30 – 16:00

E-POSTERS

New this year! The top ranked abstracts, as well as presentations from the oral sessions, will be highlighted online as electronic posters. Please go to www.aievolution.com/hbm1001 to view the e-posters, or stop by the kiosks located outside the exhibit hall.

general information

WIRELESS CONNECTION

Wireless connection will be available throughout the Catalonia Palace of Congresses. You do not need a username and password to access the network.

EVALUATIONS ONLINE!

New this year! In an effort to conduct a greener meeting, the evaluations will be done electronically this year. Each day, an email will be sent to you in an effort to gauge the effectiveness of that day's presentations. At the end of the meeting, an overall meeting evaluation will also be sent. You may also go to www.humanbrainmapping.org/Barcelona2010 to complete the evaluations for the 2010 conference. It is only through attendee's feedback that we can continue to improve the content, format, and schedule of the meeting. Your input is very important to us, and we urge you to fill out these quick surveys.

TWITTER HASH TAG

Want to know what is happening at the OHBM annual meeting? Check out what others are saying, and connect to attendees. Join the conversation on Twitter - #OHBM2010

ACCME ACCREDITATION

CME CREDIT: This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education (ACCME) through sponsorship of the Organization for Human Brain Mapping. The OHBM is accredited by the ACCME to provide continuing medical education for physicians.

The Organization for Human Brain Mapping designates this educational activity for a maximum of 42.50 PRA Category 1 Credit(s)™. Physicians should only claim credit commensurate with the extent of their participation in the activity. **CME Forms will only be available online at** www.humanbrainmapping.org/CME2010.

EDUCATIONAL COURSES

Introduction to Imaging Genetics (Full Day) 8.00
Dynamic Models in Systems Neuroscience (Full Day) 8.50
EEG/MEG: Practical Tools for Advanced Analysis (Full Day) 7.00
Multimodal Neuroimaging: Examples, Benefits and Challenges (Full Day) 8.00
Diffusion and Structural MRI (Full Day) 7.75
Advanced fMRI (Full Day) 8.00

Total # of possible credits earned at Educational Courses 8.5

ANNUAL MEETING CREDITS

Talairach Lecture 0.75
Keynote Lectures (7) . . . . . 0.50 each
Morning Workshops (4) . . . . . 1.25 each
Oral Sessions (7) . . . . . 1.25 each
Poster Sessions (8) . . . . . 1.00 each hour
Symposia (4) . . . . . 1.25 each
Poster Receptions (2) . . . . . 1.00 each hour
Closing Comments 1.00

Total # of possible credits earned at Annual Meeting 34

TOTAL NUMBER OF POSSIBLE CREDITS 42.50

notes

Advanced fMRI

Sala F (Level -1)

ORGANIZERS

Tor D. Wager, *University of Colorado, Boulder, CO, USA*
Nikolaus Kriegeskorte, *MRC Cognition and Brain Sciences Unit, Cambridge, UK*

Functional magnetic resonance imaging (fMRI) has taken a central role in the study of human brain function and its relationship to animal models. fMRI is inherently cross-disciplinary, and data acquisition and analysis are constantly evolving. Thus, there is a need for continuing education on new methods and cutting-edge neuroscientific applications of fMRI. This course addresses this need and is intended for an audience of research scientists with intermediate to advanced knowledge of fMRI techniques, who wish to extend the breadth and depth of their understanding of the current state of the art.

This year features a special emphasis on *pattern-information analysis*, an approach that has gathered a lot of momentum in recent years and is thought to target the information represented in regional neuronal population codes by analyzing differences in the fine-grained patterns of activity across many voxels within a brain region or across multiple regions.

Learning Objectives

Having completed this course, participants will be able to:

1. Understand the potential and limitations of fMRI;
2. Understand basic MRI physics and the physiological underpinnings of fMRI;
3. Understand statistical brain mapping techniques, including advanced multi-level univariate analysis, functional connectivity and pathway analyses, and causal modeling; and
4. Understand multivariate pattern-information analyses, including pattern-classifier decoding, voxel-based encoding models, and representational similarity analysis

COURSE SCHEDULE

8:30 – 8:40
Introduction
Tor D. Wager, *University of Colorado, Boulder, CO, USA*
Nikolaus Kriegeskorte, *MRC Cognition and Brain Sciences Unit, Cambridge, UK*

Part I. Fundamental Principles of fMRI and Pattern-Information Analysis

8:40 – 9:10
Minds, Brains, and Classifiers
Russ Poldrack, *University of Texas, Austin, TX, USA*

9:10 – 9:40
What Should be Known on MRI Physics for fMRI and DTI Studies
Larry Wald, *Martinos Center for Biomedical Imaging, Boston, MA, USA*

9:40 – 10:10
The Neuronal and Hemodynamic Origins of fMRI Signals and fMRI-Based Decoding
Amir Shmuel, MNI, *McGill University, Montreal, Canada*

10:10 – 10:40
High-Field, Hi-Res fMRI and Pattern-Information Analysis: A Marriage Made in Heaven
Kamil Ugurbil, *University of Minnesota, Minneapolis, MN, USA*

10:40 – 10:50
Break

Part II. Current Directions in fMRI Design and Analysis

10:50 – 11:20
Hierarchical Linear Modeling of fMRI Activity
Martin Lindquist, *Columbia University, New York, USA*

11:20 – 11:50
Causal Modeling and Effective Connectivity
Klaas Enno Stephan, *Functional Imaging Laboratory, UCL, London, UK*

11:50 – 12:20
Single and Multi-Level Path Modeling in fMRI
Tor D. Wager, *University of Colorado, Boulder, CO, USA*

12:20 – 13:30
Lunch

Part III. Pattern-Information Analysis and its Neuroscientific Applications

13:30 – 14:00
Methods and Principles of fMRI Decoding
Yuki Kamitani, *ATR Computational Neuroscience Laboratories, Kyoto, Japan*

14 :00 – 14:30
Characterizing the Primate IT Code with Representational Similarity Analysis
Nikolaus Kriegeskorte, *MRC Cognition and Brain Sciences Unit, Cambridge, UK*

14:30 – 14:40
Break

14:40 – 15:10
Decoding Primary and Higher Visual Representations by fMRI Pattern Classification
Frank Tong, *Vanderbilt University, Nashville, TN, USA*

15:10 – 15:40
Voxel-Based Encoding Models and Their Use in Decoding
Jack Gallant, *University of California, Berkeley, CA, USA*

15:40 – 16:10
Cross-Subject Alignment of Representational Spaces
James Haxby, *Dartmouth University, Hanover, NH, USA*

16:10 – 16:20
Break

16:20 – 16:50
Multivariate Decoding of Conscious and Unconscious Mental States
John-Dylan Haynes, *Bernstein Center for Computational Neuroscience, Berlin, Germany*

16:50 – 17:20
Multivariate fMRI-based Applications to Clinical Diagnosis
Vince Calhoun, *Mind Research Network and University of New Mexico, Albuquerque, NM, USA*

17:20 – 17:30
Wrap-up and Questions/Discussion

Diffusion and Structural MRI

Sala J (Level -1)

ORGANIZER

Heidi Johansen-Berg, *University of Oxford, Oxford, UK*

This course intends to provide a critical overview of classical and imaging methods for neuroanatomy and to illustrate diverse examples of these methods in practice. It is aimed at a multidisciplinary audience, and will provide some basic introduction to all methods discussed, as well as a discussion of their advantages, disadvantages and potential pitfalls. Session one will consist of methodological talks on classical neuroanatomical techniques. Session two will include methods talks on imaging methods for neuroanatomy, covering acquisition and interpretation. Session 3 will focus on practical issues for design and analysis of structural MRI experiments including discussion of artefact correction, multi-centre and longitudinal studies, statistical comparisons, voxel-based morphometry, tract-based spatial statistics, and tractography. Finally, session 4 will provide example applications of anatomical neuroimaging techniques to clinical and healthy populations.

Learning Objective

Having completed this course, participants will be able to:

1. Understand the principles, advantages, and limitations of classical techniques for neuroanatomy including tract tracing, receptor mapping, and cytoarchitectonics;
2. Understand methods for acquisition of structural MRI data and discuss interpretation of the measures they provide;
3. Understand methods for design and analysis of structural MRI experiments;
4. Give examples of applications of structural MRI to understanding brain function and dysfunction

Target Audience

The prime target audience for the whole day includes researchers with limited previous experience in structural/diffusion imaging. Certain sessions may be useful to those with more experience (e.g., Session 1 on classical neuroanatomy and session 4 on applications would be suitable for any imaging scientists; Sessions 2 and 3 on methodology would be suitable for experienced MRI researchers with little technical expertise).

COURSE SCHEDULE

Part I: Classical Methods for Neuroanatomy

8:15 – 8:45
Tract Tracing: Basic Introduction and New Developments
José Luis Lanciego, *Center for Applied Medical Research (CIMA and CIBERNED), University of Navarra, Spain*

8:45 – 9:15
Cytoarchitecture, Cortical Parcellation and Cortical Thickness
Katrin Amunts, *Institute of Medicine, Research Centre Jülich, Germany*

9:15 – 9:45
Receptor Architectonics
Karl Zilles, *Institute of Medicine, Research Centre Jülich, Germany*

9:45 – 10:15
Break

Part II: Structural Image Acquisition and Interpretation

10:15 – 10:45
Introduction to Structural MRI Methods for Grey Matter Imaging
Bruce Fischl, *Harvard Medical School, Boston, MA, USA*

10:45 – 11:15
Introduction to Diffusion Imaging and the Diffusion Tensor
Alan Connelly, *Brain Research Institute, Melbourne, Australia*

11:15 – 11:45
The Biological Basis of the Diffusion Signal
Christian Beaulieu, *University of Alberta, Edmonton, Alberta, Canada*

11:45 – 12:00
Discussion

12:00 – 13:00
Lunch

Part III: Designing and Analyzing Structural Imaging Studies

13:00 – 13:30
Practical Considerations for Diffusion Imaging Studies: Experimental Design, Processing, Artifacts, Issues in Multi-Centre and Longitudinal Studies
Carlo Pierpaoli, *National Institutes of Health, Bethesda, MD, USA*

13:30 – 14:00
Techniques for Analysis of GM Structure: VBM, DBM, Cortical Thickness
Jason Lerch, *Toronto Centre for Phenogenomics, Toronto, Canada*

14:00 – 14:30
Break

14:30 – 15:00
Statistical Analysis of Structural Brain Images
Stephen Smith, *University of Oxford, Oxford, UK*

15:00 – 15:30
Introduction to Diffusion Tractography
Tim Behrens, *University of Oxford, Oxford, UK*

Part IV. Applications of Neuroanatomy in Imaging

15:30 – 16.00
Variation in Cortical Structure in Development and Disease
David Van Essen, *Washington University School of Medicine, St Louis, MO, USA*

16:00 – 17:00
Question and Answer panel discussion with all speakers

Dynamic Models in Systems Neuroscience

Sala H1 (Level -1)

ORGANIZERS

Michael Breakspear, *Queensland Institute of Medical Research, Brisbane, Australia*
Stefan Kiebel, *Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany*

This course is designed to guide both cognitive neuroscientists and modellers through a variety of computational approaches. The talks introduce and motivate dynamic systems theory and other mathematical concepts as tools for modelling various neuroscience phenomena, ranging from the single neuron to the macroscopic network level. The participants do not require an explicit mathematical background to follow the course but need to bring a healthy interest in how ubiquitous neuroscience phenomena can be explained mechanistically. Examples will be given of how such approaches lead to the design and analysis of cognitive neuroscience experiments.

Learning Objectives

Having completed this course, participants will be able to:

1. Summarize the use of dynamic systems theory in modelling neuroscience phenomena, ranging from single neuron models to macroscopic modelling of networks;
2. Summarize new developments and research questions in dynamic models of the brain;
3. Understand the link between models of cortical activity and theories of brain function;
4. Understand the meaning and significance of stochastic processes in cortical systems; and
5. Discuss how such computational approaches can lead to the design and analysis of cognitive neuroscience experiments

COURSE SCHEDULE

Part I: Dynamic Systems Approach

Chair: Stefan Kiebel, *Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany*

8:00 – 8:10
Introduction: Modelling in Cognitive Neuroscience
Stefan Kiebel, *Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany*

8:10 – 9:00
Neuronal and Neural Ensemble Dynamics
Michael Breakspear, *Queensland Institute of Medical Research, Brisbane, Australia*

9:00 – 9:10
Discussion

9:10 – 9:55
Models for Dynamics from the Neural Microcircuit to Cortical Regions
Thomas Wennekers, *University of Plymouth, Plymouth, UK*

9:55 – 10:05
Discussion

10:05 – 10:20
Break

Part II: From Dynamics to Computational Neuroscience

Chair: Michael Breakspear, *Queensland Institute of Medical Research, Brisbane, Australia*

10:20 – 11:05
Neural Masses, Cortical Fields and Connectivity
Viktor Jirsa, *CNRS, Marseille, France*

11:05 – 11:15
Discussion

11:15 – 12:00
Slow Feature Analysis
Laurenz Wiskott, *Ruhr University Bochum, Bochum, Germany*

12:00 – 12:10
Discussion

12:10 – 13:20
Lunch

Part III: Bayesian-Based Methods

Chair: Karl Friston, *Wellcome Trust Centre for Neuroimaging, London, UK*

13:20 – 14:05
Dynamic Causal Modelling (Bayesian Inference, Model Selection)
Jean Daunizeau, *Wellcome Trust Centre for Neuroimaging, London, UK*

14:05 – 14:15
Discussion

14:15 – 15:00
Model-Based Inference on (Patho)Physiological Brain Connectivity and Synaptic Plasticity
Klaas Stephan, *University of Zurich, Zürich, Switzerland*

15:00 – 15:10
Discussion

15:10 – 15:25
Break

Part IV: Integrative models

Chair: Viktor Jirsa, *CNRS, Marseille, France*

15:25 – 16:10
Temporal Scales in the Brain
Stefan Kiebel, *Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany*

16:10 – 16:20
Discussion

16:20 – 17:05
Models in Cognitive Neuroscience
Gustavo Deco, *Universitat Pompeu Fabra, Barcelona, Spain*

17:05 – 17:15
Discussion

17:15 – 18:00
Summary, Discussion, and Farewell
Karl Friston, *Wellcome Trust Centre for Neuroimaging, London, UK*
Michael Breakspear, *Queensland Institute of Medical Research, Brisbane, Australia*
Stefan Kiebel, *Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany*

EEG/MEG: Practical Tools for Advanced Analysis

Sala H3 (Level -1)

ORGANIZERS

Ole Jensen, *Donders Institute for Brain, Cognition and Behavior, Nijmegen, The Netherlands*
Joachim Gross, *Centre for Cognitive Neuroimaging, University of Glasgow, UK*

Given the richness of the EEG/MEG data sets there is an unlimited number of ways that its analysis can be performed. This provides a challenge for new users of EEG/MEG or experienced users who want to try out new techniques. In the first part of the course we will introduce the tools for EEG/MEG analysis that have been used in cognitive/applied research; i.e. tools that have proven to work. The second part will focus on how to analyze EEG/MEG from a practical point of view. There are a number of non-commercial toolboxes being made available to the research community. As the techniques are advancing these toolboxes are becoming increasingly important in cognitive neuroscience research. The developers will briefly introduce the toolboxes. Following lunch there will be hands-on demonstrations in parallel in smaller groups.

Learning Objectives

Having completed this course, participants will be able to:

1. Understand the established analysis techniques applied in cognitive neuroscience. This includes: Time domain analysis (ERPs/ERFs), frequency domain analysis, dipole and distributed source modeling, and statistical considerations;
2. Understand possibilities and limitations applying measures of functional connectivity;
3. Appreciate emerging applications of EEG/MEG in brain-computer interfacing;
4. Make an informed choice when selecting non-commercial software toolboxes for data analysis

Target Audience

This course targets cognitive neuroscientists with an applied focus; this includes researchers new to EEG/MEG but with some background in brain imaging as well as somewhat experienced EEG/MEG researchers with an interest in learning advanced analysis.

COURSE SCHEDULE

8:00 – 8:15
Introduction
Ole Jensen, *Donders Institute for Brain, Cognition and Behavior, Nijmegen, The Netherlands*
Joachim Gross, *Centre for Cognitive Neuroimaging, University of Glasgow, UK*

8:15 – 9:00
ERPs in Cognitive Neuroscience
Charan Ranganath, *University of California-Davis, Davis, CA, USA*

9:00 – 9:45
Dipole Modeling Applied in Cognitive Neuroscience
Riitta Salmelin, *Helsinki University of Technology, Helsinki, Finland*

9:45 – 10:00
Break

10:00 – 10:45
Evoked Responses: Distributed Source Modeling
Sylvain Baillet, *Medical College of Wisconsin, Milwaukee, WI, USA*

10:45 – 11:30
Oscillatory Brain Activity: From Raw Data to Group Averages using Beamformer Approaches
Barbara Haendel, *Maastricht University, Maastricht, The Netherlands*

11:30 – 12:15
Break

12:15 – 13:00
Assessing Functional Connectivity by EEG and MEG: From Methodology to Interpretation
Karim Jerbi, *INSERM, Lyon, France*

13:00 – 14:00
Lunch

14:00 – 14:45
Non-Commercial Software Toolboxes for EEG/MEG Analysis

Fieldtrip
Room H3
Saskia Haegens, *Donders Institute, Nijmegen, The Netherlands*

BrainStorm
Room B1
Sylvain Baillet, *Medical College of Wisconsin, Milwaukee, WI, USA*
Francois Tadel, CNRS, *Marseille, France*

MNE-suite
Room K1
Matti Hamalainen, *Massachusetts General Hospital, Boston, MA, USA*

EEGlab
Room K2
Scott Makeig, *University of California-San Diego, San Diego, CA, USA*

Nutmeg
Room K3
Leighton Hinkley, *University of California-San Francisco, San Francisco, CA, USA*

SPM
Room K4
Vladimir Litvak, *University College London, London, UK*

14:45 – 15:00
Break

15:00 – 17:00
Rotating Workshop – Toolboxes are Presented

Introduction to Imaging Genetics

Sala H2 (Level -1)

ORGANIZERS

Thomas Nichols, *University of Warwick, Coventry, UK*
Jean Baptiste Poline, *Neurospin, CEA, Paris, France*

This course will introduce the fundamentals of "Imaging Genetics," the process of modeling and understanding genetic variation in brain image data. The course begins with a four-lecture genetics tutorial in the morning, designed to give imaging practitioners a quick overview of key genetics concepts and terminology. The remainder of the course covers how imagers can use genetic variables in their analyses. Specific topics include voxel-wise genome-wide models, joint multivariate modeling of imaging and genetic data, and heritability analyses of cortical surface and thickness data. The course concludes with two case studies highlighting current imaging genetics research.

Learning Objectives

Having completed this course, participants will be able to:

1. Understand the fundamentals of the molecular basis of genetic variation, and how that variation is modeled in traditional genetics studies;
2. Understand the difference between linkage, association and heritability analyses;
3. Understand the relative strengths & weaknesses of each different type of brain imaging phenotype used to find genetic association; and
4. Understand how imaging genetics can be applied to an area like reward

Target Audience

The course is designed for neuroimaging practitioners who do not necessarily have a background in genetics.

COURSE SCHEDULE

8:00 – 8:15
Introduction
Thomas Nichols, *University of Warwick, UK*
Jean-Baptiste Poline, *Neurospin, CEA, Paris, France*

8:15 – 9:00
Molecular Basis of Genetic Variation
Trygve Bakken, *University of California-San Diego, San Diego, CA, USA*

9:00 – 9:45
Structure and Analysis of Genetic Variation
Fabio Macciardi, *University of California-Irvine, Irvine, CA, USA*

9:45 – 10:00
Break

10:00 – 10:45
Quantitative Traits: Heritability, Linkage & Association
David Glahn, *Yale University, New Haven, CT, USA*

10:45 – 11:30
Epistasis: Machine Learning Approaches
Kristin Nicodemus, *Kings College, London, UK*

11:30 – 12:00
What Brain Imaging Has to Offer Genetics, and Vice Versa
Andreas Meyer-Lindenberg, *Central Institute of Mental Health, Mannheim, Germany*

12:00 – 13:00
Lunch

13:00 – 13:30
Overview of Neuroimaging Phenotypes
Roberto Toro, *Institut Pasteur, Paris, France*

13:30 – 14:05
Univariate Approaches: Multiple Testing & Voxelwise WGA
Jason Stein, *University of California-Los Angeles, Los Angeles, CA, USA*

14:05 – 14:40
Multivariate Approaches: Joint Modeling of Imaging & Genetic Data
Giovanni Montana, *Imperial College, London, UK*

14:40 – 14:55
Break

14:55 – 15:30
Heritability: Unique Genetic Contributions to Cortical Volume & Thickness
Anderson Winkler, *Yale University, New Haven, CT, USA*

15:30 – 16:00
Case Study: Genetic Control of Reward System
Christian Büchel, *University of Hamburg, Hamburg, Germany*

16:00 – 16:30
Case Study: Genetic Control of Aversive Processing in the Amygdala
Anne Beck, *Charité University, Berlin, Germany*

16:30 – 17:00
Panel Discussion

Multimodal Neuroimaging: Examples, Benefits and Challenges

Sala A (Level -1)

ORGANIZERS

Vince Clark, *Mind Research Network and University of New Mexico, Albuquerque, NM, USA*
Elia Formisano, *Maastricht University, Maastricht, The Netherlands*

Multimodal neuroimaging offers many potential benefits. By combining data from different modalities, it may be possible to achieve a description of human brain activity with a combination of spatial and temporal precision that is impossible to achieve using any single imaging modality. It might also provide a means to gain a better understanding of the underlying nature of data obtained from individual imaging modalities. It may also help to elucidate the complex relationships between the structure, chemistry, neurophysiology and vascular supply of the brain, and their relationship to cognition and behavior. Multimodal imaging also presents many challenges. It is inherently more difficult and can be more expensive. It requires more data collected from subjects, the coordination of data obtained across different imaging platforms, and often requires the close collaboration among groups of scientists coming from different backgrounds and philosophies. Ultimately the potential for novel discoveries is very high, and multimodal neuroimaging may eventually become a standard of human brain mapping. This course will cover both the broad conceptual and analysis issues covering any combination of imaging modalities, as well as detailed issues particular to specific combinations of modalities including EEG, MEG, fMRI, MRS and PET.

Learning Objectives

Having completed this course, participants will be able to:

1. Understand possibilities and limitations of multimodal imaging;
2. Understand the basic technical and organizational issues associated with performing multimodal imaging studies;
3. Learn about algorithms designed to facilitate the comparison of different imaging modalities.
4. Examine some specific examples of multimodal imaging;
5. Make informed choices when setting out to perform a multimodal study; and
6. Understand when multimodal imaging is necessary to answer a specific question and when it is not

Target Audience

This course targets cognitive neuroscientists with experience in the use of one or more imaging modalities; this includes researchers new to multimodal imaging but with a firm background in brain imaging using a single imaging modality, as well as more experienced researchers with an interest in learning advanced methods of multimodal data collection and analysis.

COURSE SCHEDULE

8:00 – 8:30
Introduction
Vince Clark, *Mind Research Network and University of New Mexico, Albuquerque, NM, USA*

8:30 – 9:30
Prospects and Challenges of Hybrid (f)MRI-PET
Jon Shah, *Jülich Institute of Neurosciences and Medicine, Jülich, Germany*

9:30 – 9:45
Break

9:45 – 10:45
MR Spectroscopy/Molecular Imaging
Rolf Gruetter, *Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland*

10:45 – 11:45
Combining Micro-Stimulation and fMRI in the Monkey: Behavioral and Brain-Wide Functional Consequences of Focal and Reversible Cortical Perturbations
Wim Vanduffel, *Harvard Medical Center, Charlestown, MA*

11:45 – 12:45
Lunch

12:45 – 13:45
Combining MEG/EEG with fMRI
Matti Hamalainen, *Massachusetts General Hospital, Boston, MA, USA*

13:45 – 14:45
Simultaneous EEG and fMRI in Humans
Tom Eichele, *University of Bergen, Bergen, Norway*

14:45 – 15:00
Break

15:00 – 16:00
Algorithms for Combined EEG-fMRI Analysis
Vince Calhoun, *Mind Research Network and University of New Mexico, Albuquerque, NM, USA*

16:00 – 17:00
Integrating Multiple Imaging Modalities via Neural Network Modeling
Rainer Goebel, *Maastricht University, Maastricht, The Netherlands*

OPENING CEREMONIES

18:00 – 19:30
Auditorium (Level 0)

Please join us for the OHBM Scientific Program Opening Ceremonies.The Wiley Young Investigator Award will be presented, as well as the presentation of the "Editor's Choice Awards".

TALAIRACH LECTURE

Oscillation-Assisted Internally Generated Cell Assembly Sequences Support Cognition
Gyorgy Buzsaki, *Rutgers University, Newark, NJ, USA*

Large-scale recording of neuronal ensembles in the hippocampus and prefrontal cortex of rodents reveal perpetually changing assembly sequences even in the absence of changing environmental inputs. Identical initial conditions trigger a similar assembly sequence, whereas different conditions gave rise, uniquely, to different sequences, thereby predicting behavioral choices, including errors.

19:30 – 21:30

WELCOME RECEPTION

The Gardens

Join us for hors d'oeuvres and a selection of local wines and beers at the Welcome Reception. The reception will be held in the Historic Gardens of Hotel Rey Juan Carlos I, immediately following the Opening Ceremonies and Talairach Lecture on Sunday, June 6. Registrants receive one complimentary ticket upon request and guest passes may be purchased for 50€.

Hotel Rey Juan Carlos I is surrounded by 25 hectares of 19th century Mediterranean gardens. The gardens create a tranquil oasis in the heart of vibrant Barcelona. Unwind after a busy day amongst the native pines, palm trees and serene ponds in the gardens.

The reception will include a variety of entertainment acts that are characteristic of the Barcelona Region. Attendees will enjoy music, dancing, as well as life figures directly from Las Rambas.

9:00 – 10:15
H1 & 2 (Level -1)

MORNING WORKSHOP

Why Should I Believe Your Model?
How To Be a Skeptical Neuroimager
Chair: Victor Solo, *University of New South Wales, Sydney, Australia*

From the beginnings of fMRI in the early 1990s, statistics and statistical signal processing have played an important role. But the methodology area is dominated, and likely always will be, by researchers without formal training in these areas. Because very sophisticated statistical signal processing methods are now appearing at HBM, it has become imperative to educate researchers about the practice and pitfalls of statistical modeling. Neuroscience, of course, is grounded in experiment, and experiments have provided a background for formulating models from the beginning (e.g. the early work of Boynton and others showing that linearity and time invariance are good first approximations for BOLD modeling). But once one commits to a particular model to analyze a particular data set, is that the end of the story? Most Neuroimaging researchers no longer question its validity. However, the statistical community has long since developed, and continues to develop, methods for assessing deviations from the model, based on the data and the model fit; sometimes called model criticism or residuals analysis. Despite strenuous attempts by individual statisticians, these methods have not entirely penetrated the Neuroimaging community.
A workshop provides an ideal venue to raise these issues and to show the principles and provide examples of how it can be done from the point of view of several practitioners. To emphasize the centrality of the issues we open the workshop with a non-statistician/signal processor who will raise a set of questions and concerns which have naturally come up in his own research and refereeing activities. This will be followed with discussion of these and many other issues from a group of statisticians/signal processors.

Learning Objectives
Having completed this workshop, participants will be able to:

1. Understand methods of statistical model criticism; and
2. Understand methods of dealing with misspecified (i.e. wrong) models

The Sound and Fury of Biomedical Statistics
Roland Henry, *University of California-San Francisco, San Francisco, CA, USA*

To Estimate or Infer? Lessons from Genetics
Thomas E. Nichols, *University of Warwick, Coventry, UK*

Modeling Neuroimaging Data – Avoiding Misspecification, Bias and Power Loss
Martin Lindquist, *Columbia University, New York, NY, USA*

Getting Used to the Noise
Mark W. Woolrich, *Oxford University, Headington, Oxford, UK*

9:00 – 10:15
J & H3 (Level -1)

MORNING WORKSHOP

Cut the Edge of NIRS/OT Technique Toward Synthesis for the Next Generation
Chair: Ippeita Dan, *Jichi Medical University, Shimotsuke,Tochigi, Japan*

Near-infrared spectroscopic (NIRS) imaging, also known as optical topography (OT), is an emerging neuroimaging technique, monitoring regional cerebral activation as relative changes of hemoglobin concentration. NIRS/OT requires only compact experimental systems, is less restrictive, and is relatively more robust to body movement. Owing to these merits, NIRS/OT provides us with a wide variety of flexible measurement options, and has been successfully applied to various domains of clinical and psychological sciences, contributing toward expanding the frontier of neuroimaging research. Although we have witnessed the rapid development of the NIRS/OT technique in recent years, we may now have to stop to think about its future direction as an imaging technique. Thus, in this morning session, we aim to seek for the scope of the NIRS/OT research to come through presenting the cutting edge research with technical innovations by rising researchers. First, Atsushi Maki, the inventor of multichannel NIRS/OT technique, will review recent innovations of the technique including development of a wearable NIRS/OT. Second, we introduce an integrative approach to create a tight link between NIRS/OT and authentic imaging techniques featuring NIRS/OT-SPM interface developed by Jong Chul Ye, and MRI-free spatial normalization methods innovated by Ippeita Dan. Finally, Matthias Schroeter explores the possibility of utilizing

MORNING WORKSHOP

Cut the Edge of NIRS/OT Technique Toward Synthesis for the Next Generation, *continued*

physiological signals in a wide spectrum of psychiatric diagnosis beyond the scope of authentic neuroimaging techniques. Together, we try to visualize the shape of NIRS/OT research to come in the next generation.

Learning Objectives
Having completed this workshop, participants will be able to:

1. Describe the impetus for future NIRS/OT research;
2. Understand state-of-the-art NIRS/OT techniques beyond elementary introduction; and
3. Understand how NIRS/OT data can be compared to other neuroimaging data

Evolution of Optical Topography: Neuroimaging to Go
Atsushi Maki, *Hitachi, Ltd., Hatoyama, Saitama, Japan*

Statistical Parameter Mapping for Near Infrared Spectroscopy using NIRS-SPM
Jong Chul Ye, *Korea Advanced Institute of Science and Technology (KAIST), Daejon, Korea*

Probabilistic Spatial Registration of NIRS/OT Data with Crossmodal Perspective
Ippeita Dan, *Jichi Medical University, Shimotsuke, Tochigi, Japan*

Enlightening the Brain? Placing Optical Imaging in Cognitive Neuroscience
Matthias L. Schroeter, *Max-Planck-Institute for Human Cognitive and Brain Sciences, Leipzig, Germany*

9:00 – 10:15
Auditorium (Level 0)

MORNING WORKSHOP

Art and the Brain: Perception and Aesthetics of Paintings and Music
Chair: Alumit Ishai, *University of Zurich, Zurich, Switzerland*

Viewing art compositions and listening to music elicits not only sensory responses in the human brain, but, importantly, emotional and aesthetic reactions. In this symposium, we will present several studies in which the neural correlates of perceiving works of art and making aesthetic judgments about them were investigated. Our symposium will cover converging empirical evidence from recent fMRI studies, as well as theoretical aspects of aesthetic preference. Specifically, we will address questions such as how does the brain interpret abstract and indeterminate paintings, and to what extent various forms of aesthetic judgments and feelings are mediated by dissociated neural mechanisms. Taken collectively, our data suggest that perceiving paintings and music is not a mere bottom-up process, but, rather, influenced by top-down mechanisms that mediate the emotional and affective components, which comprise the subjective experience of art. Our increased understanding of the neural processes involved in the experience of art provides important clues to one of the most intriguing questions in biology: What caused the so-called "creative explosion" some 50,000 to 70,000 years ago, leading to the creation of objects of art by homo sapiens.

Learning Objectives
Having completed this workshop, participants will be able to:

1. Introduce the topic and review recent studies in the field; and
2. Explore implications for future research

Neural Correlates of Object Indeterminacy in Art Compositions
Alumit Ishai, *University of Zurich, Zurich, Switzerland*

Neuroaesthetics of Visual Art: Lessons in Causation from Aristotle
Oshin Vartanian, *University of Toronto at Scarborough, Scarborough, Ontario, Canada*

Investigating the Elusive Aesthetic Sense with Neuroimaging
Martin Skov, *Copenhagen University Hospital, Hvidovre, Denmark*

It's Sad, But I Like It: On the Aesthetic Dissociation Between Preference and Basic Emotions in Music
Elvira Brattico, *University of Helsinki, Helsinki, Finland*

10:30 – 12:00
Auditorium (Level 0)

LOC SYMPOSIUM

The Legacy of Ramon y Cajal: From Brain Structure to Cognitive Function – The Spanish School Version
Chairs: Emiliano Ricciardi, *University of Pisa, Pisa, Italy*
Maria Victoria Sanchez-Vives, *University of Alicante, Alicante, Spain*

The work of the Spanish neuroscientist Ramón y Cajal studying the microanatomy of virtually the entire central nervous system, his observations regarding degeneration and regeneration, together with his theories about the function, development and plasticity of the nervous system had a profound impact on researchers of his era. More importantly, these studies represent the roots of what are today some of the most exciting areas of discovery in terms of the structure and function of the brain in both health and disease. Recently, methodologies utilized to study in vivo brain function have given us an additional powerful 'microscope' to dissect the intimate molecular aspects of brain function. The goal of this symposium is to highlight distinguished Spanish neuroscientists that preserve and expand Cajal's focus on unraveling the extraordinary complexity of the nervous system, and on defining the manner in which information flows through this finely organized synaptic network. The importance of electrophysiological and metabolic measures in mediating mnemonic and linguistic processes will be discussed, and the first comprehensive attempt to reverse-engineer the mammalian brain to understand brain function and dysfunction through detailed simulations, the *Blue Brain Project*, will be introduced.

Learning Objectives
Having completed this symposium, participants will be able to:

1. Learn about the attempts to create a physiological simulation of cerebral cortex for biomedical applications;
2. Understand the usefulness of electrophysiological methods to track the time-course of bilingual speech production;
3. Increase their knowledge of the interplay between brain oscillations and memory building; and
4. Understand the clinical value of using MEG in the diagnosis of neurodegenerative disorders

The Cajal Blue Brain Project: Three-dimensional Electron Microscope Imaging of the Cerebral Cortex
Javier de Felipe, *Instituto Cajal, Madrid, Spain*

Role of Brain Oscillations in Mediating Encoding and Retrieval Processes
Mercedes Atienza, *University Pablo de Olavide, Seville, Spain*

Role of MEG in the Early Diagnosis of Alzheimers Disease
Fernando Maestu, *Complutense University of Madrid, Madrid, Spain*

Tracking the Cognitive Processes Involved Speech Production
Albert Costa, *Universitat Pompeu Fabra, Barcelona, Spain*

12:00 – 12:30
Auditorium (Level 0)

KEYNOTE LECTURE

From Monkey to Human and From Human to Monkey: What Do We Learn?
Wim Vanduffel, *Harvard Medical Center, Charlestown, MA, USA*

First, Wim Vanduffel will review fMRI data showing that focal and reversible perturbations of functional networks result in widespread compensatory mechanisms in the monkey. Secondly, he will present a completely novel, model-free and data-driven method to determine functional homologies between human and monkey cortex based on temporal characteristics of fMRI signals.

12:30 – 13:30

POSTER SESSION

Exhibit Hall (Level 0)

#1-589 MT-AM (Odd numbered posters present)
Brain Stimulation: TDCS, Brain Stimulation-other, Deep Brain Stimulation
Cognition and Attention: Executive Function, Perception, Imagery, Awareness, Reasoning and Problem Solving, Space, Time and Number Coding
Disorders of the Nervous System: Epilepsy, Mood and Anxiety Disorders, Parkinson's Disease and other Basal Ganglia, Schizophrenia

Multifunction Area (Level -1)

#591-1593 MT-AM (Odd numbered posters present)
Disorders of the Nervous System: Stroke and Recovery of Function
Emotion and Motivation: Reward, Sexual Behavior, Social Behavior
Imaging Techniques and Contrast Mechanism: Multi-Modal Integration, Optical Imaging/NIRS/MRS, Perfusion MRI, PET, TMS
Language: Production, Reading/Writing
Memory and Learning: Plasticity (Normal and Following Pathology), Working Memory
Modeling and Analysis: Functional Connectivity & Structural Equation Modeling, Motion Correction/Spatial Normal, Atlas Construction, Multivariate Modeling, PCA and ICA, Non-Bold fMRI, Task-Independent Activity, Univariate Modeling, Linear and Nonlinear
Motor Behavior: Cerebellum, Hand Movements, Locomotion, Motor-Premotor Cortex / Motor Cortical Functions
Neuroanatomy: DTI Studies, Application
Physiology, Metabolism and Neurotransmission
Sensory Systems: Pain and Autonomic Function, Tactile/Somatosensory, Vision

13:30 – 14:45

LUNCH

14:45 – 15:45

POSTER SESSION

Exhibit Hall (Level 0)

#2-588 MT-PM (Even numbered posters present)

Brain Stimulation: TDCS, Brain Stimulation-other, Deep Brain Stimulation

Cognition and Attention: Executive Function, Perception, Imagery, Awareness, Reasoning and Problem Solving, Space, Time and Number Coding

Disorders of the Nervous System: Epilepsy, Mood and Anxiety Disorders, Parkinson's Disease and other Basal Ganglia, Schizophrenia

Multifunction Area (Level -1)

#590-1592 MT-PM (Even numbered posters present)

Disorders of the Nervous System: Stroke and Recovery of Function

Emotion and Motivation: Reward, Sexual Behavior, Social Behavior

Imaging Techniques and Contrast Mechanism: Multi-Modal Integration, Optical Imaging/NIRS/MRS, Perfusion MRI, PET, TMS

Language: Production, Reading/Writing

Memory and Learning: Plasticity (Normal and Following Pathology), Working Memory

Modeling and Analysis: Functional Connectivity & Structural Equation Modeling, Motion Correction/Spatial Normal, Atlas Construction, Multivariate Modeling, PCA and ICA, Non-Bold fMRI, Task-Independent Activity, Univariate Modeling, Linear and Nonlinear

Motor Behavior: Cerebellum, Hand Movements, Motor-Premotor Cortex / Motor Cortical Functions

Neuroanatomy: DTI Studies, Application

Physiology, Metabolism and Neurotransmission

Sensory Systems: Pain and Autonomic Function, Tactile/Somatosensory, Vision

16:00 – 17:15

Auditorium (Level 0)

SYMPOSIUM

Decoding Information Conveyed by Cortical Columns: Mechanisms and Advanced Methods for Investigating Higher-Order Cognitive Functions

Chair: Amir Shmuel, *MNI, McGill University, Montreal, QC, Canada; CMRR, University of Minnesota, USA*

Multivariate machine learning algorithms have demonstrated powerful capacity to decode information represented in functional MR images of the human brain. They have been used successfully to decode mental state, perceived sensory information, representation of words, and other information conveyed by all lobes of the brain. In several studies, machine learning algorithms decoded information conveyed by cortical columns, e.g. ocular dominance and orientation of visual stimuli. The symposium will present analysis of the mechanisms of decoding information represented in cortical columns using functional imaging data of sub-millimeter resolution. It will feature advanced paradigms of decoding, i.e. modular decoding approaches and recursive feature elimination, and their use for investigating cognition. We will demonstrate means by which decoding can be exploited to study the use of cortical columns in visual cognition. The symposium will emphasize the tremendous potential of fMRI pattern classification, not only for investigating basic sensory processes, but also for studying the neural bases of higher-order cognitive functions.

Learning Objectives

Having completed this symposium, participants will be able to:

1. Understand the sources of selective signals exploited by multivariate classification to decode information conveyed by cortical columns;
2. Learn advanced decoding paradigms, including modular decoding and feature elimination; and
3. Become familiar with means by which decoding can be exploited to investigate the neural bases of higher-order cognitive functions

Visual Image Reconstruction from Human Brain Activity: A Modular Decoding Approach

Yukiasu Kamitani, *Keihanna Science City, Japan*

Decoding Voice, Speech and Sounds from Distributed Patterns of Activity in Lower Auditory Areas: The Role of Advanced Feature Selection in fMRI Data Analysis

Federico Demartino, *Maastricht University, Maastricht, The Netherlands*

SYMPOSIUM

Decoding Information Conveyed by Cortical Columns: Mechanisms and Advanced Methods for Investigating Higher-Order Cognitive Functions, *continued*

Mechanisms of fMRI-Based Decoding of Information Conveyed by Cortical Columns
Amir Shmuel, *MNI, McGill University, Montreal, QC, Canada; CMRR, University of Minnesota, USA*

Decoding the Contents of Visual Feature Perception, Attention, and Working Memory
Frank Tong, *Vanderbilt University, Nashville, TN, USA*

17:15 – 17:45
Auditorium (Level 0)

KEYNOTE LECTURE

Decoding Memories
Eleanor Maguire, *University College London, London, UK*

In recent years, multivariate pattern classification has been performed on fMRI data permitting prediction of mental states from local patterns of BOLD signal across voxels. Here I will describe how we have applied this approach to spatial and episodic memories to investigate their representation in the medial temporal lobes.

18:00 – 19:15

ORAL SESSIONS

Oral session presentations are chosen by the Program Committee from submitted abstracts using criteria of quality and timeliness; a wide spectrum of investigation is represented.

J & H3 (Level -1)
O-M1: Memory and Learning
Chair: Donna Rose Addis, *The University of Auckland, Auckland, New Zealand*

18:00
910 MT-PM: Spatial and Temporal Dynamics of Learning-Induced Functional and Structural Plasticity
Marco Taubert, *Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany*

18:15
1174 WTh-PM: Seed-Based and Model-Free Connectivity in Shallow Sleep after Learning
Eelco van Dongen, *Radboud University Nijmegen, Donders Institute (RU/DI-BCB), Nijmegen, Netherlands*

18:30
1168 WTh-PM: When are Anti-Correlations Bad? Large-Scale Network Dynamics Supporting Contextual Recollection
Alex Fornito, *University of Cambridge, Cambridge, UK*

18:45
1169 WTh-AM: Episodic Memory Retrieval Dissociates Posterior from Anterior Nodes of the Default Mode Network
Carlo Sestieri, *University of Chieti-Pescara, Chieti, Italy*

19:00
1172 WTh-PM: Theta Oscillations Reflect the Dynamics of Interference in Episodic Memory Retrieval
Tobias Staudigl, *University of Magdeburg, Magdeburg, Germany*

H1 & 2 (Level -1)
O-M2: Modeling and Analysis: Brain Networks I
Chair: Edward Bullmore, *University Of Cambridge, Cambridge, UK*

18:00
1267 WTh-AM: Interpretable Multivariate Models for Whole-Brain fMRI
Logan Grosenick, *Stanford University, Stanford, CA, USA*

18:15
1273 WTh-AM: A Hierarchical Generative Model for Percept Reconstruction
Marcel van Gerven, *Institute for Computing and Information Sciences, Nijmegen, Netherlands*

18:30
1292 WTh-PM: Inter-Subject Hyperalignment of Neural Representational Spaces to Derive Common Categorical Patterns
Jyothi Swaroop Guntupalli, *Dartmouth College, Hanover, NH, USA*

18:45
1140 MT-PM: Functional Assessment of Intrinsic Connectivity Networks
Angela Laird, *University of Texas Health Science Center San Antonio, San Antonio, TX, USA*

19:00
985 MT-AM: Googling the Brain: Measures for Capturing Centrality and Neural Information Flow
Xi-Nian Zuo, *Phyllis Green and Randolph Cowen Institute for Pediatric Neuroscience at the NYU Child Study Center, New York, USA*

Auditorium (Level 0)
O-M3: Disorders of the Nervous System: Psychiatry
Chair: *Cameron Carter, University of California-Davis, Davis, CA, USA*

18:00
933 WTh-AM: Emotion Recognition and Neural Connectivity Modulation by Insula Self-Regulation in Schizophrenia
Sergio Ruiz, *Institute of Medical Psychology and Behavioral Neurobiology, Tübingen, Tübingen, Germany*

18:15
427 MT-AM: Glutamate in pgACC Predicts its Resting State Connectivity with Anterior Insula in Major Depression
Dorothea Horn, *Otto-von-Guericke University Magdeburg, Magdeburg, Germany*

18:30
372 MT-PM: Differences in Early and Late Brain Responses to Phobic Stimuli between Subtypes of Specific Phobia
Xavier Caseras, *Cardiff University, Cardiff, UK*

18:45
1047 MT-AM: Altered Functional Connectivity in Psychopathy: A Resting-State fMRI Analysis
Benjamin Shannon, *Washington University, Saint Louis, MO, USA*

19:00
283 WTh-AM: Structural and Functional Convergent Evidence that Cocaine Alters Medial Prefrontal Regions
Yihong Yang, *National Institute on Drug Abuse, Baltimore, MD, USA*

9:00 – 10:15
H1 & 2 (Level -1)

MORNING WORKSHOP

Retinotopic Mapping: Techniques, Current Concepts and Research Trends

Chairs: Mark M. Schira, *Prince of Wales Medical Research Institute, Sydney, Australia* and
Serge O. Dumoulin, *Utrecht University, Utrecht, The Netherlands*

A key property of visual cortex is the existence of multiple retinotopic maps. These maps are not simply an anatomical property, but a key principle in the functional organization of information processing. Reconstructing these maps in vivo, Retinotopic mapping provides insight into cortical organization, but also are a prerequisite for many investigations of the visual system. Retinotopic maps further serve as a model to elucidate more general principles of brain function, such as plasticity and interspecies comparisons. In this symposium we will introduce recent developments of retinotopic mapping techniques such as i) high resolution, ii) 7T and iii) model-based pRF techniques. We will discuss current concepts and interspecies differences of retinotopic cortex in humans and non-human primates including the foveal confluence. Finally, we will highlight some recent insights on clinical manifestations and cortical plasticity based on current retinotopic concepts.

Learning Objectives
Having completed this workshop, participants will be able to:

1. Understand techniques and methods used in contemporary retinotopic mapping;
2. Learn the implications of the visual field maps organization on general brain functions;
3. Discuss the comparisons between human and non-human visual cortex; and
4. Understand some of the clinical implications of retinotopic mapping

The Foveal Confluence, Organization, Algebraic Modeling Functions, Simple Mapping Techniques
Mark M. Schira, *Prince of Wales Medical Research Institute, Sydney, Australia*

Visual Cortex Reorganization After Injury: Lessons from Primate fMRI
Stelios M. Smirnakis, *Baylor College of Medicine, Houston, TX, USA*

Retinopic Mapping at 7 Tesla Magnetic Field Strength
Michael B. Hoffmann, *University Magdeburg, Magdeburg, Germany*

Measuring Population Receptive Field Properties using fMRI: Methods and Applications
Serge O. Dumoulin, *Utrecht University, Utrecht, The Netherlands*

9:00 – 10:15
J & H3 (Level -1)

MORNING WORKSHOP

Human Intra-Cranial Electrophysiology (ICE) in Mind/Brain Mapping – Linking Levels of Analysis from Cells to Psychology

Chair: Ned T. Sahin, *University of California-San Diego, La Jolla, CA, USA*

Description
This session will overview advantages of Intra-cranial Electrophysiology (ICE) and highlight results in four cognitive domains that were uniquely achievable with ICE. The study of human cognition is severely limited by current methods. Neuroimaging has transformed our gamut of addressable questions yet still imposes limitations of temporal, spatial, and physiological resolution. These translate into a limitation on 'algorithmic resolution' or the types of computation that we can observe in the brain. While direct recordings from brain tissue are generally not possible in humans, and aspects of cognition (e.g. language) have no useful animal model, patients with electrodes implanted in their brains for surgery (and who have normal cognitive abilities) provide a unique opportunity to Link the Levels of inquiry. ICE allows measurements from single unit activity (SUA) up to local-field and brain-surface potentials (ICE ERPs). In conjunction with non-invasive methods, it also allows us to ask what level(s) actually best reveal mechanisms of cognition – since more resolution is not always better. Finally, fine-scale ICE results can inform non-invasive methods. For instance, if disparate mental functions are traced to the same neural circuit, but are compartmentalized in time rather than space, paradigms for fMRI can and must be designed to manipulate those functions temporally.

Dr. Canolty will link recordings in humans and macaque – of brain surface potentials down to SUA – and demonstrate how neural oscillations solve two main problems: multi-scale integration and long-range communication. He will show how high-gamma oscillations relate to information processing within brain regions, and slower oscillations relate to transfer of information across brain regions. Dr. Lachaux will continue the theme of oscillations, overviewing recent discoveries of gamma-band suppression and its relation to the Default Mode network. He will also help alleviate some popular misconceptions about the ICE methodology. Dr. Bidet-Caulet will report recordings from the cortical surface as well as deep within auditory cortex and show how attention modifies the way we process sounds. She will demonstrate different effects at different points in time and in different subregions of our auditory cortex. Dr. Sahin will continue the theme of information separation in time more than space, with a discovery that neuronal populations within the storied Broca's area process three aspects of language – meaning, structure, and sound – overlapping in anatomical space but separated in time. He will also connect with the oscillations theme, and reveal an information flow chart for read and speaking, with processing stages linked but separated in time, space and oscillatory frequency.

Learning Objectives

Having completed this workshop, participants will be able to:

1. Identify capabilities and advantages of intracranial electrophysiology (ICE) for investigating the mechanisms of human cognition, at multiple levels of abstraction;
2. List several recent high-profile advances in human language, auditory attention, "default-mode" brain states, and large-scale network connectivity, which have been uniquely enabled by ICE; and
3. Design and interpret fMRI experiments (or other neuroimaging) in frameworks informed by spatiotemporal results from ICE, in order to move further beyond anatomical structure-to-function mapping

Using Neuronal Oscillations to Investigate Large-Scale Brain Networks

Ryan T. Canolty, *University of California - Berkeley, Berkeley, CA, USA*

Intra-Cranial Electrophysiology (ICE) as a Mind Mapping Tool; and Specific Links Between Gamma-Band Suppression and the Default-Mode Network

Jean-Philippe Lachaux, *INSERM U821, Lyon, France*

Auditory Attention: Insights from Cortical and Intra-Cortical EEG Recordings in Human

Aurélie Bidet-Caulet, *University of California - Berkeley, Berkeley, CA, USA*

From Cells to Psycholinguistics – It is a Matter of Time

Ned T. Sahin, *University of California - San Diego, La Jolla, CA, USA*

9:00 – 10:15

Auditorium (Level 0)

MORNING WORKSHOP

Connectivity in the Developing Brain

Chair: James R. Booth, *Northwestern University, Evanston, IL, USA*

The goal of this symposium is to investigate organizational principles underlying brain maturation in typical and atypical development. Research in this area is beginning to converge on several principles that seem to characterize development including selective increases in critical long-range connections (integration) and decreases in anatomically close short-range connections. There also seems to be greater separation of networks as there is greater segregation of cortical from sub-cortical systems and of the default from task-related networks. Findings also show developmental increases in hierarchical organization in which convergence zones receive greater top-down modulation and bottom-up input. These organizational principles are investigated in resting state data and also within a variety of cognitive domains including mathematical processing, cognitive control, reading and language. A variety of analytical techniques are highlighted, including graph theory, small world analyses, effective connectivity, and combination of functional connectivity with tractography from diffusion tensor imaging (DTI). These organizational principles are extended to understand the role of experience and the nature of atypical development including Autism, Tourette's Syndome, Attention Deficit Hyperactivity Disorder (ADHD) and Reading Disability, among other neuro-developmental disorders.

MORNING WORKSHOP
Connectivity in the Developing Brain, *continued*

Learning Objectives
Having completed this workshop, participants will be able to:

1. Understand general principles that characterize connectivity in the developing cortex in typical and atypical populations;
2. Understand the development of core cognitive functions; and
3. Understand different analytical approaches for studying development

Development of Large-Scale Functional Brain Networks in Children
Vinod Menon, *Stanford University, Palo Alto, CA, USA*

Maturing Functional Brain Networks in Typical and Atypical Development
Damien Fair, *Oregon Health and Science University, Portland, OR, USA*

Pathways to Language: Brain Structural Prerequisites for Language Functions
Angela D. Friederici, *Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany* and Jens Brauer, *Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany*

Effects of Age and Skill on Effective Connectivity Within and Between Hemispheres During Language Processing in Children
Tali Bitan, *Haifa University, Haifa, Israel and* James R. Booth, *Northwestern University, Evanston, IL, USA*

10:30 – 11:45

ORAL SESSIONS
Oral session presentations are chosen by the Program Committee from submitted abstracts using criteria of quality and timeliness; a wide spectrum of investigation is represented.

J & H3 (Level -1)
O-T1: Imaging Techniques: Structural Connectivity
Chair: Yaniv Assaf, *Tel Aviv University, Ramat Aviv, Israel*

10:30
1462 WTh-PM: The Human Connectome: Exploring Nerve Fiber Tracts at a Micrometer Scale by Means of Polarized Light
Markus Axer, *Institute of Neuroscience and Medicine (INM-1), Research Centre, Jülich, Germany*

10:45
830 WTh-PM: Diffusional Kurtosis Imaging Tractography of Crossing Fibers
Mariana Lazar, *New York University School of Medicine, New York, NY, USA*

11:00
1469 WTh-AM: Correspondence Between In Vivo Axonal Diameter and Cortical Connectivity of the Corpus Callosum
Flavio Dell'Acqua, *Natbrainlab, Institute of Psychiatry, King's College London, London, UK*

11:15
813 WTh-AM: Diffusion Tractography in Ex Vivo Human Brains: Steady-State Free Precession Outperforms Spin Echo
Karla Miller, *University of Oxford, Oxford, UK*

11:30
1370 MT-PM: Connectivity-Based Segmentation of Human Amygdala Nuclei using Probabilistic Tractography
Zeynep Saygin, *Massachusetts Institute of Technology, Cambridge, MA, USA*

H1 & 2 (Level -1)
O-T2: How Genes Map the Brain
Chair: Jay Giedd, *NIMH, Bethesda, MD, USA*

10:30
1196 MT-PM: Genetic Analyses of Resting-State Studies in Adolescent Twins: Preliminary Results
F. Xavier Castellanos, *Phyllis Green and Randolph Cowen Institute for Pediatric Neuroscience at the NYU Child Study Center, New York, USA*

10:45
744 WTh-PM: BDNF Effects on Brain Fiber Microstructure Replicated in Two Twin Samples (N=455)
Ming-Chang Chiang, *Laboratory of Neuro Imaging, Dept. of Neurology, UCLA School of Medicine, Los Angeles, CA, USA*

11:00
726 WTh-PM: Voxelwise Genome-Wide Association Study (vGWAS)
Jason Stein, *UCLA, Los Angeles, CA, USA*

11:15
248 WTh-PM: Variation in Rates of Nicotine Metabolism is a Predictor of Neural Reactivity to Smoking Cues
Deborah Tang, *McGill University, Montreal, PQ, Canada*

11:30
554 MT-PM: Genetic Variation in NOS1 Predicts Presynaptic Dopamine Synthesis
Daniel Eisenberg, *National Institutes of Health, Bethesda, MD, USA*

Auditorium (Level 0)
O-T3: Language
Chair: Christophe Pallier, *CEA/SAC/DSV/DRM/Neurospin, Gif-sur-Yvette, France*

10:30
1085 WTh-AM: Do We Click? Speaker-Listener Neuronal Coupling Underlies Successful Communication
Lauren Silbert, *Princeton University, Brooklyn, NY, USA*

10:45
908 MT-PM: Experience-Dependent Brain Structural Plasticity in Simultaneous Language Interpreters
Narly Golestani, *University of Geneva, Geneva, Switzerland*

11:00
1581 MT-AM: Anatomy of the Arcuate Fasciculus is Associated with Phonology and Reading Skills in Children
Jason Yeatman, *Stanford University, Stanford, CA, USA*

11:15
1056 WTh-PM: Empathy Matters for Social Language Processing: ERP Evidence from Individuals With and Without ASD
Danielle van den Brink, *Radboud University Nijmegen, Donders Institute (RU/DI-BCB), Nijmegen, Netherlands*

11:30
1538 MT-PM: Medial Frontal Network Attenuates Cortical Response During Auditory Feedback in Speech
Ingrid Christoffels, *Leiden University, Leiden, Netherlands*

12:00 – 12:30
Auditorium (Level 0)
KEYNOTE LECTURE
Psychiatric Neuroimaging: From Maps to Mechanisms
Andreas Meyer-Lindenberg, *Central Institute of Mental Health, Mannheim, Germany*

Using psychotic disorders as an example, we discuss a research strategy where the integration of neuroimaging data with information from genetics and epidemiology provides mechanistic insights not only into the cognitive neuropsychology, but also into the molecular pathophysiology and aetiology of these illnesses that create a basis for novel treatments.

12:30 – 13:30
POSTER SESSION
Exhibit Hall (Level 0)
#1-589 MT-AM (Odd numbered posters present)
Brain Stimulation: TDCS, Brain Stimulation-other, Deep Brain Stimulation
Cognition and Attention: Executive Function, Perception, Imagery, Awareness, Reasoning and Problem Solving, Space, Time and Number Coding
Disorders of the Nervous System: Epilepsy, Mood and Anxiety Disorders, Parkinson's Disease and other Basal Ganglia, Schizophrenia

Multifunction Area (Level -1)
#591-1593 MT-AM (Odd numbered posters present)
Disorders of the Nervous System: Stroke and Recovery of Function
Emotion and Motivation: Reward, Sexual Behavior, Social Behavior
Imaging Techniques and Contrast Mechanism: Multi-Modal Integration, Optical Imaging/NIRS/MRS, Perfusion MRI, PET, TMS
Language: Production, Reading/Writing
Memory and Learning: Plasticity (Normal and Following Pathology), Working Memory
Modeling and Analysis: Functional Connectivity & Structural Equation Modeling, Motion Correction/Spatial Normal, Atlas Construction, Multivariate Modeling, PCA and ICA, Non-Bold fMRI, Task-Independent Activity, Univariate Modeling, Linear and Nonlinear
Motor Behavior: Cerebellum, Hand Movements, Locomotion, Motor-Premotor Cortex / Motor Cortical Functions
Neuroanatomy: DTI Studies, Application
Physiology, Metabolism and Neurotransmission
Sensory Systems: Pain and Autonomic Function, Tactile/Somatosensory, Vision

13:30 – 14:45

LUNCH

14:45 – 15:45

POSTER SESSION

Exhibit Hall (Level 0)

#2-588 MT-PM (Even numbered posters present)
Brain Stimulation: TDCS, Brain Stimulation-other, Deep Brain Stimulation
Cognition and Attention: Executive Function, Perception, Imagery, Awareness, Reasoning and Problem Solving, Space, Time and Number Coding
Disorders of the Nervous System: Epilepsy, Mood and Anxiety Disorders, Parkinson's Disease and other Basal Ganglia, Schizophrenia

Multifunction Area (Level -1)

#590-1592 MT-PM (Even numbered posters present)
Disorders of the Nervous System: Stroke and Recovery of Function
Emotion and Motivation: Reward, Sexual Behavior, Social Behavior
Imaging Techniques and Contrast Mechanism: Multi-Modal Integration, Optical Imaging/NIRS/MRS, Perfusion MRI, PET, TMS
Language: Production, Reading/Writing
Memory and Learning: Plasticity (Normal and Following Pathology), Working Memory
Modeling and Analysis: Functional Connectivity & Structural Equation Modeling, Motion Correction/Spatial Normal, Atlas Construction, Multivariate Modeling, PCA and ICA, Non-Bold fMRI, Task-Independent Activity, Univariate Modeling, Linear and Nonlinear
Motor Behavior: Cerebellum, Hand Movements, Motor-Premotor Cortex / Motor Cortical Functions
Neuroanatomy: DTI Studies, Application
Physiology, Metabolism and Neurotransmission
Sensory Systems: Pain and Autonomic Function, Tactile/Somatosensory, Vision

16:00 – 17:15

Auditorium (Level 0)

SYMPOSIUM

The Dopamine Midbrain

Chair: David H. Zald, *Vanderbilt University, Nashville, TN, USA*

The dopamine system is critically involved in motivation, movement and learning, and dysfunction of the dopamine system is implicated in a range of neuropsychiatric disorders ranging from Parkinson's to addiction and schizophrenia. The dopaminergic midbrain, comprising the substantia nigra, ventral tegmental area and retrorubal fields, provides dopamine to most areas of the forebrain and as such lies at the core of understanding dopamine neurotransmission. Elucidating the specific characteristics of midbrain activity is critical to understanding the functions served by dopamine. However, only in the last few years have neuroimaging researchers begun to examine the functional characteristics of this region in humans. In parallel, neuroanatomical and neurophysiological studies in nonhuman primates have provided increasing detail regarding the structure, connections, and firing properties of the dopamine midbrain. The proposed symposium details this rapidly emerging field by bringing together experts on the neuroanatomy, neurophysiology and cognitive neuroscience of midbrain functions in nonhuman and human primates. The aim is to provide audience members with state of the art coverage of recent findings and methodological advances in the exploration of the dopamine system, with a particular emphasis on making translational connections between animal studies and human neuroimaging.

Learning Objectives

Having completed this symposium, participants will be able to:

1. Understand the neurocircuitry of dopamine midbrain;
2. Understand the functional characteristics and correlates of dopamine midbrain activity; and
3. Understand recent advances in neuroimaging of the dopamine midbrain

Integrative Neuroanatomy of Dopamine Midbrain Projections to the Striatum

Suzanne Haber, *University of Rochester, New York, NY, USA*

Temporal Discounting Suggests Subjective Rather than Objective Reward Value Coding in Primate Dopamine Neurons and Human Ventral Striatum

Wolfram Schultz, *Cambridge University, Cambridge, UK*

On the Relationship Between Hemodynamic Responses of the Substantia Nigra/Ventral Tegmental Area (SN/VTA) and Dopamine Release
Emrah Duzel, *University College London, London, UK*

Personality and Behavioral Correlates of Dopamine Midbrain Functioning
David H. Zald, *Vanderbilt University, Nashville, TN, USA*

17:15 – 17:45
Auditorium (Level 0)

KEYNOTE LECTURE

The Brain's Default Network
Randy Buckner, *Harvard University, Cambridge, MA, USA*

Left without an immediate task that demands full attention, our minds wander. During these moments, a consistent set of brain regions – known as the default network – is preferentially active. Details about the anatomy and function provide insight into the default network's contribution to cognition and its importance to neurologic and psychiatric illness.

18:00 – 19:15

ORAL SESSIONS

Oral session presentations are chosen by the Program Committee from submitted abstracts using criteria of quality and timeliness; a wide spectrum of investigation is represented.

Auditorium (Level 0)
O-T4: Emotion and Motivation 1: Reward, Decision Making, and Learning
Chair: Todd Hare, *California Institute of Technology, Pasadena, CA, USA*

18:00
515 WTh-AM: Episodic Future Thought Reduces Delay Discounting through Prefrontal-Mediotemporal Interactions
Jan Peters, *NeuroimageNord, Department of Systems Neuroscience, University Medical Center Hamburg-Eppendorf, Hamburg, Germany*

18:15
638 MT-PM: Characterization of Prediction Error Signals in the Ventral Tegmental Area under Variable Timings
Miriam Klein, *Sobell Department of Motor Neuroscience and Movement Disorders, University College London, London, UK*

18:30
288 WTh-PM: Ventral Striatal Response to Incentive Stimuli Anticipation in Children of Alcoholics
Wai-Ying Wendy Yau, *University of Michigan, Ann Arbor, MI, USA*

18:45
21 WTh-AM: Disrupting the Prefrontal Cortex Diminishes Emotional Biases in Moral Judgment
Sebastien Tassy, *CNRS, Marseille, France*

19:00
666 MT-PM: Exacerbated Responses Specific to Monetary Rewards in Pathological Gamblers
Guillaume Sescousse, *'Reward and decison making' group, Cognitive Neuroscience Centre, CNRS, Lyon, France*

H1 & H2 (Level -1)
O-T5: Cognition and Attention: Brain Plasticity and Aging
Chair: Cheryl Grady, *Rotman Research Institute, Toronto, Canada*

18:00
202 WTh-PM: Developmental Differences in Brain Activation Can Be Reduced After Practice
Dietsje D. Jolles, *Leiden University, Leiden, The Netherlands*

18:15
26 WTh-PM: Changes in Cortical Plasticity Across the Lifespan
Alvaro Pascual-Leone, *Harvard Medical School, Boston, MA, USA*

18:30
158 WTh-PM: Age-Related Neural Changes in Remembering and Imagining
Donna Rose Addis, *Dept of Psychology, The University of Auckland, Auckland, New Zealand*

18:45
153 WTh-AM: Microstructural Changes and Atrophy in Brain White Matter Tracts With Aging
Federica Agosta, *Scientific Institute and University Ospedale San Raffaele, Milan, Italy*

19:00
1097 MT-AM: Brain Networks for Aβ Deposition, Glucose Metabolism, and Gray Matter Density in Normal Aging
Hwamee Oh, *University of California, Berkeley, Berkeley, CA, USA*

ORAL SESSIONS, *continued*

J & H3 (Level -1)

O-T6: Imaging Techniques: Functional MRI

Chair: Peter Bandettini, *National Institute of Mental Health/ NIH, Bethesda, MD, USA*

18:00

1172 MT-PM: A Specific-to-Nonspecific Transition of Resting Brain Network from Light to Deep Anesthesia

Xiao Liu, *CMRR, University of Minnesota, Minneapolis, MN, USA*

18:15

925 WTh-AM: Differences Between DfMRI and BOLD fMRI Responses in Parietal Cortex Using a Working Memory Task

Toshihiko Aso, *Human Brain Research Center, Kyoto University Graduate School of Medicine, Kyoto, Japan*

18:30

717 WTh-AM: Neurovascular Coupling in Human Visual Cortex is Modulated by Cyclooxygenase-1 (COX-1) Gene Variant

Sebastian Heinzel, *University of Wuerzburg, Department of Psychiatry, Psychosomatics and Psychotherapy, Wuerzburg, Germany*

18:45

918 WTh-PM: Three Dimensional Echo-Planar Imaging at 7 Tesla

Benedikt Poser, *Erwin L Hahn Institute for Magnetic Resonance Imaging, Essen, Germany*

19:00

920 WTh-PM: White Matter fMRI Activation in the Internal Capsule: Co-Localization With DTI Tractography

Erin Mazerolle, *National Research Council, Halifax, NS, Canada*

19:30 – 20:30

POSTER RECEPTION

Exhibit Hall (Level 0)

#1-589 MT-AM and MT-PM (Monday and Tuesday presenters)

Brain Stimulation: TDCS, Brain Stimulation-other, Deep Brain Stimulation

Cognition and Attention: Executive Function, Perception, Imagery, Awareness, Reasoning and Problem Solving, Space, Time and Number Coding

Disorders of the Nervous System: Epilepsy, Mood and Anxiety Disorders, Parkinson's Disease and other Basal Ganglia, Schizophrenia

Multifunction Area (Level -1)

#590-1593 MT-AM and MT-PM (Monday and Tuesday presenters)

Disorders of the Nervous System: Stroke and Recovery of Function

Emotion and Motivation: Reward, Sexual Behavior, Social Behavior

Imaging Techniques and Contrast Mechanism: Multi-Modal Integration, Optical Imaging/NIRS/MRS, Perfusion MRI, PET, TMS

Language: Production, Reading/Writing

Memory and Learning: Plasticity (Normal and Following Pathology), Working Memory

Modeling and Analysis: Functional Connectivity & Structural Equation Modeling, Motion Correction/Spatial Normal, Atlas Construction, Multivariate Modeling, PCA and ICA, Non-Bold fMRI, Task-Independent Activity, Univariate Modeling, Linear and Nonlinear

Motor Behavior: Cerebellum, Hand Movements, Locomotion, Motor-Premotor Cortex / Motor Cortical Functions

Neuroanatomy: DTI Studies, Application

Physiology, Metabolism and Neurotransmission

Sensory Systems: Pain and Autonomic Function, Tactile/Somatosensory, Vision

9:00 – 10:15
Auditorium (Level 0)

MORNING WORKSHOP

Data-Driven Mapping of Functional Architecture and Functional Ontologies

Chair: Christian F. Beckmann, *Imperial College London, London, UK*

Neural activity organizes into distributed networks that exhibit system-level synchronization as a key mechanism for the dynamic integration of information across different processing units. In recent years, resting-FMRI has been used to characterize the distributed nature of such patterns of functional co-activation in BOLD recordings in the form of Resting-State Networks, and DTI has provided important information about structural organization and correspondences. Other types of recordings (such as electrophysiological measurements) as well as neuro-informatics databases (such as BrainMap) can be used to further detail a picture of the distributed nature of brain's functional architecture. In this symposium we will focus on the ability to robustly characterize, using functional imaging data, functional parcellation, functional architecture and functional ontolgoies of the human brain.

Our panel includes leading experts in the analysis of resting fMRI data and data-driven characterization of co-activations (S. Smith), the bottom-up modeling of brain connectivity and the relationships to recordings from different neuroimaging modalities (C. Honey), the investigation of co-activation patterns by means of meta-analytic approaches using neuro-informatics databases (P. Fox) as well as the generation of cognitive ontologies in relation to neuroimaging data (R. Poldrack). The first talk (Smith) will focus on hierarchies in the characterization of the functional architecture as well as on the optimality and interpretability of imaging-derived measures of functional connectivity in comparison to more abstract measures. The second talk (Honey) will review the evidence for a robust relationship between large-scale anatomical and functional architectures of the human brain and discuss computational models which can make predictions of this relationship as seen in different mesoscopic and microscopic neurophysiological recordings based on e.g. fMRI, MEG, and iEEG. The third talk (Fox) will describe the degree to which such macroscopic patterns of co-activations can be derived by means of meta-analysis of a large neuro-informatics database of imaging findings (BrainMap). The final talk (Poldrack) will detail ways in which such classification analysis of neuroinformatics databases along with meta-analyses of fMRI data can help determine the selectivity of activation, i.e. assess how much more are a region's activity is specific to a particular cognitive process and thus provide insights into which aspects of the current cognitive ontology are correct and which may require revision.

Learning Objectives
Having completed this workshop, participants will be able to:

1. Describe different techniques for the characterization of functional networks from imaging data;
2. Understand different approaches for investigating such patterns by means of bottom-up modeling and structure-function relationships and by means of meta-analysis of large data bases of imaging findings;
3. Describe the degree to which such functional parcellations provide functional ontologies for the description of imaging findings; and
4. Understand the inferences that cognitive neuroscientists can draw from imaging data

RSN-Derived Functional Hierarchies/Networks
Steve Smith, *FMRIB Centre - University of Oxford, Oxford, UK*

Structural and Functional Architecture of the Brain: Computational and Intuitive Models
Christopher J. Honey, *Princeton University, Princeton, NJ, USA*

BrainMap Networks: Meta-Analytic Regional Parcellation and Functional Characterization
Peter T. Fox, *Research Imaging Center, San Antonio, TX, USA*

Cognitive Ontologies and Brain State Classification
Russ Poldrack, *Imaging Research Center, Austin, TX, USA*

9:00 – 10:15
H1 & 2 (Level -1)

MORNING WORKSHOP

Multi-Subject Surface-Based Analysis of fMRI Data: Challenges, Solutions and Limitations

Chair: Bertrand Thirion, *INRIA Saclay-Île-de-France, Gif sur Yvette, France*

Being able to detect reliably functional activity in a population of subjects is crucial in human brain mapping, both for the understanding of cognitive functions in normal subjects and the analysis of patient data. The usual group analysis approach proceeds by normalizing brain volumes to a common volume-based (3D) template, and then to apply voxel-based statistical methodology. However, a large part of the data acquired in functional MRI (fMRI) experiments aims at localizing cortical activity, and methods working on the cortical surface may provide better inter-subject registration than the standard procedures that process the data in 3D. In particular, surface-based (2D) analysis has proved to be very useful for the study of activity in the primary visual cortex. Surface-based analysis is made available to the community through several dedicated software's (among others, Freesurfer, Caret, Suma, Brainvoyager, Brainvisa). Nevertheless, few assessments of the performance of 2D versus 3D procedures have been shown so far, mostly because inter-subject cortical surface maps are not easily obtained. More precisely, surface-based analysis requires additional complex algorithmic procedures (projection of the volume-based data onto the surface, data processing on irregular mesh grids, check of the quality of the data sampled on meshes) and dedicated software tools (e.g. manipulation of meshes and mesh-related information) with respect to traditional 3D analysis.

Learning Objectives
This workshop will review the current state of the art and discuss open questions or limitations of 2D analysis procedures:

1. In the current state of the art, how accurate is surface-based registration when comparing similar regions across subjects?
2. In the particular context of multi-subject fMRI data analysis, which evidence do we have that surface-based approaches may be better suited than volume-based approaches?
3. Is there any difference in the statistical assessment of the presence of activation between volume and surface-based data?
4. What are the most prominent difficulties or shortcomings of multi-subject surface-based fMRI data analysis?

The Cortical Surface: Its Organization and the Influence on Surface-Based Data Processing
Olivier Coulon, *Laboratoire LSIS, UMR CNRS 6168, Marseille, France*

Predicting Anatomical and Functional Boundaries from Surface-Based Inter-Subject Alignment
Douglas Greve, *Mass General Hospital, Charlestown, MA, USA*

Beyond Blind Alignment of Macro-Anatomy for Analysis of Brain Functions and Brodmann Areas
B.T. Thomas Yeo, *Massachusetts Institute of Technology, Cambridge, MA, USA*

Surface-Based Analysis of fMRI Data: Strengths and Limitations
Bertrand Thirion, *INRIA Saclay-Île-de-France, Gif sur Yvette, France*

9:00 – 10:15
J & H3 (Level -1)

MORNING WORKSHOP

Gene Function Meets Brain Function

Chair: Mallar Chakravarty, *Rotman Research Institute, Baycrest Hospital and the Mouse Imaging Center, Hospital for Sick Children, Toronto, Ontario, Canada*

Imaging genomics is a rapidly expanding field and has increased understanding of the genetic underpinnings of brain morphology and function in both normal individuals and those suffering from complex disorders of the central nervous system. There is mounting evidence that phenotypes elucidated through brain imaging experiments may be more sensitive for prediction and diagnosis of neurological disorders in comparison to subjective intake and diagnostic interviews and scores. Analyses of single nucleotide polymorphisms associated with these phenotypes have identified candidate genes responsible for the pathological evolution of specific diseases. Integration of large-scale spatially localized analyses of gene expression could be used in brain image analysis to help better understand functional networks at the systems neuroscience level. In this symposium we will bridge the disciplines of genetics, gene expression analysis, and imaging from microscopic to population analyses. The speaker panel includes leaders in: methodological and experimental findings in large-scale imaging genetics studies in

schizophrenia (Dr. Peter Kirsch, Germany) and Alzheimer's Disease (Dr. Michael Greicius, USA), the generation of spatially localized maps of the three-dimensional gene expression (Dr. Ed Lein, USA), and population-level imaging genetics studies on heritable components of brain morphology and function (Dr. Tomas Paus, Canada). Drs. Kirsch and Greicius will demonstrate how imaging genetics can be used as a tool to advance translational research and the methods required to analyze candidate genes within a neuroimaging context. Dr. Lein will discuss the Allen Institute Human Brain Atlas and how it will be a crucial tool for linking neuroimaging tools with spatially localized, genome-wide, gene expression patterns. Finally, Dr. Paus will demonstrate how imaging genetics can be used as a phenotyping tool to analyze brain development and function.

Learning Objectives
Having completed this workshop, participants will be able to:

1. Describe the different aspects of genetics in neuroscience: from the molecular biological underpinnings of brain function to the genotypes associated with specific phenotypes in normal and pathological cases;
2. Examine different analysis approaches of brain imaging data with respect to specific genes or the entire genome; and
3. Conceptualize issues and limitations involved in the quantity of data required to perform genome-wide imaging studies

In-Vivo Imaging Genetics: A Scaffold for Translational Science
Peter Kirsch, *Central Institute of Mental Health, Mannheim, Germany*

ApoE and Brain Imaging: A Cautionary Tale and a Guide to Future Studies
Michael D. Greicius, *Stanford University, Stanford, CA, USA*

The Allen Human Brain Atlas: Mapping Genes in Action
Ed Lein, *Allen Institute for Brain Science, Seattle, WA, USA*

Populations Neuroscience: A New Merging of Disciplines
Tomas Paus, *Rotman Research Institute, Baycrest Hospital, Toronto, Ontario, Canada*

10:30 - 11:45

ORAL SESSIONS

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Auditorium (Level 0)

O-W1: Cognition and Attention: Perception, Attention & Imagery I

Chair: Andreas Kleinschmidt, *INSERM/CEA, Gif sur Yvette, France*

10:30
1497 MT-AM: Retinotopic Organization of Object-Selective Areas
Anne Schobert, *University of Trento, Rovereto, Italy*

10:45
152 MT-PM: A Category-Specific Response to Animals in the Right Human Amygdala
Florian Mormann, *University of Bonn, Bonn, Germany*

11:00
1563 WTh-AM: Bifurcation in Neural Dynamics between Valid and Invalid Sensory Inferences
Luc Arnal, *Inserm U960 - Ecole Normale Supérieure, Paris, France*

11:15
1585 WTh-AM: Processing Spatial and Pitch Attributes of Sounds in the Absence of Visual Experience: an fMRI Study
Olivier Collignon, *Université de Montréal, Montreal, Canada*

11:30
130 WTh-PM: Neural Mechanisms of Face Selection in the Context of (dis)similar Faces Identified by EEG and fMRI
Francesco Gentile, *Faculty of Psychology and Neuroscience, Maastricht University, The Netherlands, Maastricht, Netherlands*

ORAL SESSIONS, *continued*

H1 & 2 (Level -1)

O-W2: Disorders of the Nervous System: Neurology

Chair: James Rowe, *Cambrdge University Neurology Unit, Cambridge, UK*

10:30
598 MT-PM: Degeneration of Corpus Callosum and Corticospinal Tract Relates to Recovery of Function After Stroke
Ling Wang, *Cognitive Neurology (INM-3), Institute of Neuroscience and Medicine, Research Centre Juelich, Juelich, Germany*

10:45
599 MT-AM: Structural Plasticity in Stroke Inferred by Probabilistic Fiber Tracking and MEG
Monica Bucci, *University of California-San Francisco, San Francisco, CA, USA*

11:00
453 WTh-AM: Structural and Functional Connectivity Predicts Cognitive Function after Traumatic Brain Injury
David Sharp, *Imperial College London, London, UK*

11:15
82 WTh-PM: Bilateral White Matter Disconnections in Balint's Syndrome and Simultanagnosia
Magdalena Chechlacz, *Behavioural Brain Sciences Centre, School of Psychology, University of Birmingham, Birmingham, UK*

11:30
454 MT-PM: Investigating Parkinson's Disease Using Rotating Frame MRI
Shalom Michaeli, *University of Minnesota, Minneapolis, MN, USA*

B1 & 2 (Level -1)

O-W3: Brain Development

Petra Hüppi, *University of Geneva, Geneva, Switzerland*

10:30
1220 MT-PM: Using Tensor Based Morphometry to Explore Differential Tissue Growth Patterns in Normal Fetal Brains
Piotr Habas, *University of California San Francisco, San Francisco, CA, USA*

10:45
196 WTh-PM: Age Related Cognitive Changes and Subcortical Structural Connections Between Resting State Networks
Martin Ystad, *University of Bergen, Bergen, Norway*

11:00
1221 MT-AM: Detection of Early Brain Folding Patterns of the Normal Human Fetuses In-Utero
Ahmad Roosta, *University of California-San Francisco, San Francisco, CA, USA*

11:15
792 WTh-PM: Hierarchical Cortical Surface Normalization for Longitudinal Pediatric MRI Data
Junki Lee, *Montreal Neurological Institute, Montreal, Canada*

11:30
1463 WTh-AM: Preservation Effects and Hippocampal Increases of Grey Matter During Healthy Adulthood
Gabriel Ziegler, *Structural Brain Mapping Group, Department of Psychiatry, University of Jena, Jena, Germany*

J & H3 (Level -1)

O-W4: Imaging Techniques: Multimodal Approaches

Chair: Hidenao Fukuyama, *Kyoto University, Kyoto, Japan*

10:30
13 MT-AM: Localized Modulation of Brain Function using Pulsed Low-Intensity Focused Ultrasound
Alvaro Pascual-Leone, *Harvard Medical School, Boston, MA, USA*

10:45
777 MT-AM: Concurrent tDCS and fMRI Reveals Modulatory Effects on Brain Activation During a Simple Motor Task
Peter Dechent, *MR-Research in Neurology and Psychiatry, University Medical Center Göttingen, Göttingen,Germany*

11:00
805 MT-AM: Feasibility of Simultaneous Intracranial EEG-fMRI in Humans: First Results
David Carmichael, *UCL Institute of Neurology, London, UK*

11:15
840 MT-PM: Tract-Based Magnetic Resonance Spectroscopy of the Cingulum Bundle at 7 Tesla
René Mandl, *University Medical Center Utrecht, Utrecht, Netherlands*

11:30
1270 MT-PM: GABAergic Tone and its Responsiveness to Modulation Reflect Individual Performance of Motor Tasks
Velicia Bachtiar, *Oxford Centre for Functional Magnetic Resonance Imaging of the Brain (FMRIB), University of Oxford, Oxford, UK*

12:00 – 12:30
Auditorium (Level 0)

KEYNOTE LECTURE

Using fMRI to Detect Conscious Awareness
Adrian Owen, *MRC Cognition and Brain Sciences Unit, Cambridge, UK*

In the absence of any overt behavioral response, how can we ever know, unequivocally, that another person is aware? With reference to various altered states of consciousness, including anesthesia and vegetative state, I will contrast those circumstances in which fMRI can be used to infer awareness with those circumstances in which it cannot.

12:30 – 13:30

POSTER SESSION

Exhibit Hall (Level 0)
#1-589 WTh-AM (Odd numbered posters present)
Brain Stimulation: TMS
Cognition and Attention: Attention (Auditory, Tactile, Motor), Attention (Visual), Cognitive Aging, Cognitive Development
Disorders of the Nervous System: Addiction, Alzheimer and Dementia, Autism, Brain and Spinal Cord Trauma, Developmental Disorders,
Emotion and Motivation: Decision Making, Emotional Learning

Multifunction Area (Level -1)
#591-1587 WTh-AM (Odd numbered posters present)
Emotion and Motivation: Emotional Perception
Genetics
Imaging Techniques and Contrast Mechanism: Anatomical MRI, Diffusion MRI, EEG, Functional MRI, MEG
Language: Comprehension, Language Acquisition
Memory and Learning: Learning (Explicit and Implicit), Long-term Memory (Episodic, Semantic, Autobiographical)
Modeling and Analysis: Bayesian Modeling, Bold fMRI, Classification and Predictive Modeling, Exploratory Methods, Artifact Removal, Flattening, Segmentation
Motor Behavior: Basal Ganglia/Brainstem/Spinal Cord, Brain-machine Interface, Eye Movements/ Visuomotor Processing
Neuroanatomy: Anatomical Studies
Pharmacology
Sensory Systems: Auditory/ Vestibular, Chemical Senses: Olfaction, Taste, Multisensory and Crossmodal

13:30 – 14:45

LUNCH

14:45 – 15:45

POSTER SESSION

Exhibit Hall (Level 0)
#2-588 WTh-PM (Even numbered posters present)
Brain Stimulation: TMS
Cognition and Attention: Attention (Auditory, Tactile, Motor), Attention (Visual), Cognitive Aging, Cognitive Development
Disorders of the Nervous System: Addiction, Alzheimer and Dementia, Autism, Brain and Spinal Cord Trauma, Developmental Disorders,
Emotion and Motivation: Decision Making, Emotional Learning

Multifunction Area (Level -1)
#590-1588 WTh-PM (Even numbered posters present)
Emotion and Motivation: Emotional Perception
Genetics
Imaging Techniques and Contrast Mechanism: Anatomical MRI, Diffusion MRI, EEG, Functional MRI, MEG
Language: Comprehension, Language Acquisition
Memory and Learning: Learning (Explicit and Implicit), Long-term Memory (Episodic, Semantic, Autobiographical)
Modeling and Analysis: Bayesian Modeling, Bold fMRI, Classification and Predictive Modeling, Exploratory Methods, Artifact Removal, Flattening, Segmentation
Motor Behavior: Basal Ganglia/Brainstem/Spinal Cord, Brain-machine Interface, Eye Movements/ Visuomotor Processing
Neuroanatomy: Anatomical Studies
Pharmacology
Sensory Systems: Auditory/ Vestibular, Chemical Senses: Olfaction, Taste, Multisensory and Crossmodal

16:00 – 17:15
Auditorium (Level 0)

SYMPOSIUM

Top-Down Modulation in Visual Processing

Chair: Adam Gazzaley, *University of California-San Francisco, San Francisco, CA, USA*

The brain does not passively represent the external environment in a purely stimulus-driven manner. Top-down modulation mechanisms, which involve both enhancing and suppressing influences from "higher" cortical areas on neural activity in "lower" cortical and subcortical regions, can dramatically influence how information is represented and stored. This symposium will present theoretical models and supporting empirical data on the role of top-down modulation in visual processing. Evidence is emerging that alterations in top-down modulation underlie a wide range of cognitive deficits associated with normal aging and neurological disease, such as Alzheimer's disease, PTSD, ADHD and autism. It is anticipated that therapeutic interventions (both pharmacological and cognitive training) that address these underlying mechanisms will have a broad impact on such conditions. Top-down modulation has critical implications for our understanding of the flow of information in the brain, and elucidating the underlying mechanisms establishes a foundation for characterizing all higher cognitive operations.

Learning Objectives
Having completed this symposium, participants will be able to:

1. Describe recent theoretical models and empirical evidence of top-down modulation;
2. Describe the presence of converging mechanisms operating at multiple levels of the visual system and its impact on diverse cognitive domains; and
3. Develop future research projects that will empirically address predictions emerging from these concepts and theories

Attentional Selection from Natural Scenes
Sabine Kastner, *Princeton University, Princeton, NJ, USA*

Neural Synchrony and Selective Attention
Robert Desimone, *Massachusetts Institute of Technology, Cambridge, MA, USA*

Top-Down Predictions in Visual Cognition
Moshe Bar, *Harvard Medical School, Charlestown, MA, USA*

Top-Down Enhancement and Suppression in Visual Association Cortex
Adam Gazzaley, *University of California-San Francisco, San Francisco, CA, USA*

17:15 – 17:45
Auditorium (Level 0)

TOWN HALL MEETING

All OHBM meeting attendees are encouraged to participate in this open forum; where you will have an opportunity to ask questions and give the OHBM leadership feedback. Updates on future meeting sites and council elections will be presented.

17:45 – 18:15
Auditorium (Level 0)

KEYNOTE LECTURE

Electrophysiological Imaging of the Attention Network
Pascal Fries, *Ernst Strüngmann Institute, Frankfurt, Germany*

Selective attention requires the flexible communication among several brain areas. We have recorded large parts of the visual attention network, including areas V1, V2, V4, parietal, premotor and prefrontal areas simultaneously with a 252-channel subdural grid electrode in monkeys. Attention strongly modulated the precision of brain-wide synchronization in several networks with distinct spatio-spectral signature.

18:30 – 19:45

ORAL SESSIONS

Oral session presentations are chosen by the Program Committee from submitted abstracts using criteria of quality and timeliness; a wide spectrum of investigation is represented.

J & H3 (Level -1)
O-W5: Emotion and Motivation 2: Pharmacology and Neurotransmitters
Chair: Jean-Claude Dreher, *Center for Cognitive Neurocience, Bron, France*

18:30
616 WTh-PM: Dynamically Changing Corticosteroid Effects on the Human Amygdala
Marloes Henckens, *Radboud University Nijmegen, Donders Institute for Brain, Cognition and Behaviour, Nijmegen, Netherlands*

18:45
1414 MT-PM: Threat-Dependent Modulation of Anterior Insula Connectivity Predicts Pain
Kay Henning Brodersen, *Department of Computer Science, ETH Zurich, Zurich, Switzerland*

19:00
584 WTh-PM: Dopamine and Serotonin Influence the Neural Computation of Appetitive and Aversive Prediction Errors
Catherine Hindi Attar, *NeuroimageNord, Department of Systems Neuroscience, University Medical Center Hamburg-Eppendorf, Hamburg, Germany*

19:15
567 WTh-AM: Fear Conditioning Mechanisms Associated With Trait Vulnerability to Anxiety
Sonia Bishop, *University of California-Berkeley, Berkeley, CA, USA*

19:30
633 MT-AM: Dopamine D3 Receptor Availability Explains Orbitofrontal Connectivity With Cognitive Networks
David Cole, *Imperial College, London, UK*

H1 & 2 (Level -1)
O-W6: Modeling and Analysis: Brain Networks II
Chair: Pedro Valdés-Sosa, *Cuban Neuroscience Center, Havana, Cuba*

18:30
828 MT-PM: Functional Connectivity Analysis is Reliable in Whole-Head Near-Infrared Spectroscopy
Jan Mehnert, *Berlin NeuroImaging Center, Berlin, Germany*

18:45
1192 WTh-PM: Bayesian Comparison of Local Electrovascular Coupling Models Using Simultaneous EEG-fMRI
Maria Joao Rosa, *Wellcome Trust Centre for NeuroImaging, UCL, London,UK*

19:00
972 MT-PM: Dynamic Granger Causality With Embedded Hemodynamic Model
Martin Havlicek, *Brno University of Technology, Brno, Czech Republic*

19:15
994 MT-PM: Laminar-Specific Functional Connectivity: Distinguishing Directionality in Cortical Networks
Jonathan Polimeni, *Massachusetts General Hospital, Charlestown, MA, USA*

19:30
503 MT-AM: Dysmodularity in Schizophrenia: Unsupervised Learning and Graph Theory Approaches
Aaron Alexander-Bloch, *NIH/University of Cambridge, Cambridge, UK*

ORAL SESSIONS, *continued*

Auditorium (Level 0)
O-W7: Cognition and Attention: Perception, Attention and Imagery II
Chair: Anna Christina Nobre, *Oxford University, Oxford, UK*

18:30
165 MT-AM: Separating the Sensory, Perceptual and Motor Components of Visual Decision Making
Jose Rebola, *IBILI, Faculty of Medicine, University of Coimbra, Coimbra, Portugal*

18:45
1471 MT-AM: Manipulating Visual Perception with Real-Time fMRI-based Neurofeedback Training
Frank Scharnowski, *Wellcome Trust Centre for Neuroimaging, UCL, London, UK*

19:00
136 MT-PM: The Power of Imagination – How Anticipatory Mental Imagery Alters Perception of Fearful Faces
Esther Diekhof, *Centre for Translational Research in Systems Neuroscience, Dep. Psychiatry, Georg August University, Göttingen, Germany*

19:15
951 MT-AM: Direct Evidence for Top-Down Prefrontal Control of Visual Working Memory Targets During Distraction
Eva Feredoes, *University College London, London, UK*

19:30
157 MT-AM: Separating Conscious Access from Spatial Attention During Masking: An MEG Study
Valentin Wyart, *University of Oxford, Oxford, UK*

21:00 – 1:00
CLUB NIGHT: RAZZMATAZZ NIGHTCLUB
Almogàvers 122
Barcelona, Spain 08018

Spend an evening at Razzmatazz, Barcelona's famous discotheque. Entertainment features live music by Mother Groove and a DJ. The party is complimentary to registrants, but a ticket must be requested. Additional guest tickets are 50.00€.

Razzmatazz is one of the most important concert venues in Barcelona; in size, facilities and features. It is located in the Poble Nou district, just ten minutes from Plaça Catalunya, the heart of the city. Razzmatazz occupies a 3,700 m2 area divided into five different self-contained spaces that can also be used together. The illuminated facade is by the Catalan designer Sergio Ibáñez.

Directions: From the Congress Center, take the subway from the Zona Universitaria station to the Espanya station. Transfer to the Red Line and take subway to the Marina station. Walk along Almogavers Street 3 minutes to the Club.

9:00 – 10:15
H1 & 2 (Level -1)

MORNING WORKSHOP

Measuring Consciousness in Disorders of Connectivity

Chair: Quentin Noirhomme, *University of Liège, Liège, Belgium*

During the last decade, functional neuroimaging of disorders of consciousness (i.e., coma, vegetative state and minimally conscious state) has evolved from measuring resting cerebral blood flow or electrical activity to studying functional response to somatosensory stimuli and to active paradigm asking patients to concentrate on doing a task like playing tennis. While these methods have improved the care of the patients, highlighting their capability to hear or to feel pain, or detecting early recovery of consciousness in paralyzed patients, they also show how difficult it is to distinguish different states of consciousness. Somatosensory studies show that minimally conscious patients could have functional activation similar to control while, if vegetative patients mainly show islands of activation, some also show activation similar to controls. Furthermore, they did not provide any prognostic markers leaving patient, family and caregivers in the smog. In parallel, theories of consciousness have evolved and highlighted the importance of global activation as mandatory for awareness. These new developments combined with the results of the somatosensory studies have reframed disorders of consciousness as a disconnection syndrome. Brain connectivity can now be measured with a large range of methods. However, brain connectivity measures have seldom been used in disorders of consciousness. This workshop will examine some of the first results of connectivity studies in disorders of consciousness. The speakers will cover a range of functional and effective connectivity approaches based on fMRI, EEG, TMS and intracranial recordings. Results obtained in other unconscious states (i.e., anesthesia and deep sleep) will be reviewed. The workshop will offer the opportunity to discuss the role of brain connectivity as a potential new marker for diagnosis and prognosis.

Learning Objectives
Having completed this workshop, participants will be able to:

1. Discuss the potential role of connectivity in disorders of consciousness;
2. Describe various methods for measuring connectivity and explain how they apply to disorders of consciousness; and
3. Understand some of the current issues regarding brain functional and effective connectivity

Could Connectivity be a Measure of Graded Consciousness?
Anil K. Seth, *University of Sussex, Brighton, UK*

A Perturbational Approach to Measure Effective Connectivity and the Brain's Capacity for Consciousness at the Patient's Bedside.
Marcello Massimini, *University of Milan, Milan, Italy*

The Enigmatic Role of Spontaneous Activity in the Human Brain
Rafi Malach, *Weizmann Institute of Science, Rehovot, Israel*

Default Mode Network in Disorders of Consciousness
Mélanie Boly, *University of Liège, Liège, Belgium*

9:00 – 10:15
J & H3 (Level -1)

MORNING WORKSHOP

fMRI in Clinical Trials: Promise, Progress and Path Forward

Chair: Adam Schwarz, *Eli Lilly and Company, Indianapolis, ID, USA*

As the field of neuroimaging matures there is increasing interest in the application of fMRI in clinical trials, both to elucidate neuropsychiatric disease processes and as a probe of pharmacological effects on brain systems. In the latter context, fMRI holds considerable promise both as a CNS biomarker and as a means to more fully understand the action of novel therapeutics. However, performing fMRI studies in this context places increased demands over single-site research studies, including the possible involvement of multiple scanning sites, comparability of data, operating exigencies of the pharmaceutical industry, regulatory requirements and the issue of possible confounding effects of drugs or disease on physiology impacting the hemodynamic response. To maximize the success and impact of fMRI in the trial setting, an understanding and appreciation of these issues is essential. This symposium will provide a themed overview and stimulate discussion around several key aspects.

MORNING WORKSHOP

fMRI in Clinical Trials: Promise, Progress and Path Forward, *continued*

Learning Objectives
Having completed this workshop, participants will be able to:

1. Understand issues involved in multi-site fMRI studies and recommendations for how to address them;
2. Appreciate the operating exigencies of the pharmaceutical industry and relevant regulatory requirements; and
3. Have an awareness of possible confounding effects of drugs or disease on physiology impacting the hemodynamic response, and steps to minimize the risk of data misinterpretation

fMRI in Drug Development: Its Role and Demands
Alexandre Coimbra, *Merck and Co., West Point, Pennsylvania, USA*

Physiological Confounds in Clinical fMRI Trials: Issues and Mitigation
Peter Jezzard, *FMRIB Centre, Oxford, UK*

Steps Towards Quantitative fMRI
N Jon Shah, *Research Center Juelich, Juelich, Germany*

A Cookbook for Multi-Site fMRI Studies
Douglas N Greve, *Athinoula A Martinos Center for Biomedical Imaging, Charlestown, Massachussetts, USA*

9:00 – 10:15
Auditorium (Level 0)

MORNING WORKSHOP

Prospects for Noninvasive Microstructural Parcellation of Human Cortex: The Challenge of an In Vivo Brodmann Atlas

Chair: Stefan Geyer, *Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany*

It is a highly desirable goal, pointed out by Francis Crick in 1993, and later by Devlin in 2007, to bring our understanding of human cortical anatomy to a level which enables comparative analysis of microstructural and functional organization. Functional MRI has been steadily improved as a tool for neuroscience over the last 15 years, and can now claim submillimeter precision, at a field strength of 7 Tesla. However, anatomical MRI has generally been regarded as incapable of discriminating functionally distinct cortical areas, lacking both sufficient sensitivity and spatial resolution. At most, functional MRI activations have been correlated with probabilistic atlases of cortical anatomy derived from cytoarchitectonic and chemoarchitectonic studies of cadaver brain slices. These characterize the brain as a mosaic of Brodmann areas, with further subdivisions. In order to associate activations in an individual brain with identifiable cortical areas, the brain volumetric image must be normalized into standard MNI space. Unfortunately, due to significant inter-individual differences, areas of good structural overlap of cortical areas between cadaver brains in the probabilistic atlas are often small, which thus severely limits interpretation of functional images.

With the advent of high field MRI scanners for human use, progress has accelerated in recent years in the identification of specific cortical areas by their anatomical MRI signature alone. The major factor providing MRI contrast in cortical gray matter is the presence of myelin, which reduces water proton density, decreases longitudinal and transverse relaxation times, provides magnetization transfer contrast, causes water diffusion to become anisotropic, and generates phase contrast in susceptibility-weighted phase images. The heavily myelinated bands of Baillarger have been observed in MR images of primary visual cortex (since 1992) and the visual motion area V5/MT. The effect on image contrast of the densely myelinated radial axons traversing primary auditory and primary motor cortex has also been observed with MRI. However, while several other brain regions show layer structure in MR images, they have not yet been given specific Brodmann classification. The myeloarchitectonic maps elaborated by Vogt and Vogt in the early 20th century are little known, their important publications still await translation into English, and no full user-friendly concordance yet exists relating their areas with those of Brodmann.

Learning Objectives
Having completed this workshop, participants will be able to:

1. Understand the fundamental importance of microstructural information for correctly interpreting functional activations in the brain;
2. Learn about state-of-the-art structural mapping approaches in post-mortem brains and the problems of correlation with functional data on a probabilistic basis; and
3. Appreciate that the ultimate goal is structure-function correlation in the same subjects, which can only be achieved by in vivo microstructural MR mapping

Histological Mapping of the Cerebral Cortex and Probabilistic Structure-Function Assignments
Simon Eickhoff, *University Hospital Aachen, Aachen, Germany*

Molecular Profiling Approaches to Brain Mapping
Andreas Jeromin, *Banyan Biomarkers, Alachua, FL, USA*

Identifying Anatomically Distinct Cortical Regions Using High Resolution In Vivo Structural MR Images: Development and Validation of 3D Methods
Gary Egan, *University of Melbourne, Melbourne, Victoria, Australia*

Using Structural, Functional, and Connectivity Information to Identify Architectonic Regions in the Human Cerebral Cortex
Bruce Fischl, *Massachusetts General Hospital, Charlestown, MA, USA*

10:30 – 11:45

ORAL SESSIONS

Oral session presentations are chosen by the Program Committee from submitted abstracts using criteria of quality and timeliness; a wide spectrum of investigation is represented.

Auditorium (Level 0)

O-Th1: Motor Behavior

Chair: Henning Boecker, *University of Bonn, Bonn, Germany*

10:30
41 MT-AM: Functional and Anatomical Networks of Inhibition and Action Reprogramming
Rogier Mars, *University of Oxford, Oxford, UK*

10:45
34 WTh-PM: Development of a Baboon Model Using rTMS as Evidenced by Rate Dependent Regional Brain Activations
Felipe Salinas, *University of Texas Health Science Center at San Antonio, San Antonio, TX, USA*

11:00
512 WTh-PM: Structural Differences in Cortico-Basal Ganglia Networks Predict Individual Decision-Making Behavior
Birte Forstmann, *University of Amsterdam, Amsterdam, Netherlands*

11:15
1260 MT-PM: Parieto-Frontal Circuits Integrating Perceptual Information Into a Motor Plan – a TMS-EEG Study
Lennart Verhagen, *Radboud University Nijmegen, Donders Institute, Nijmegen, Netherlands*

11:30
148 WTh-PM: Age Differences in Callosal Contributions to Cognitive and Motor Performance
Brett Fling, *University of Michigan, Ann Arbor, MI, USA*

J & H3 (Level -1)

O-Th2: Brain Structure and Anatomy

Chair: Jean-François Mangin, *CEA, NeuroSpin, Gif-Sur-Yvette, France*

10:30
751 WTh-AM: Sensitivity of MRI Resonance Frequency to the Orientation of Brain Tissue Microstructure
Jongho Lee, *NIH, Bethesda, USA*

10:45
1326 MT-PM: Striato-Cortical Probabilistic Connectivity Atlases to infer Biomarkers of Huntington's Disease
Linda Marrakchi-Kacem, *NeuroSpin, CEA, Gif-Sur-Yvette, France*

11:00
1491 WTh-AM: Subpial Pathology as a Substrate for Cortical Thinning in Multiple Sclerosis: a 7T MRI study
Caterina Mainero, *Massachusetts General Hospital, Charlestown, MA, USA*

11:15
1104 MT-PM: Hippocampal and Ventricular Differences in 804 ADNI Subjects Mapped with Multivariate TBM
Yalin Wang, *UCLA, Los Angeles, CA, USA*

11:30
716 WTh-PM: Genetic Influences on Brain Architecture from Multivariate Diffusion Tensor Data
Agatha Lee, *LONI-UCLA, Los Angeles, CA, USA*

ORAL SESSIONS, *continued*

H1 & 2 (Level -1)

O-Th3: Disorders of the Nervous System: Development

Chair: Philip Shaw, *National Institute of Mental Health, Bethesda, MD, USA*

10:30
428 WTh-PM: Meta-Analysis of Whole-Brain Structural VBM Studies in Autism
Esther Via, *Hospital Universitari de Bellvitge, Barcelona, Spain*

10:45
426 WTh-PM: Striatal Functional Connectivity in Children with Autism: A Window into Brain Differentiation
Adriana Di Martino, *Phyllis Green and Randolph Cowen Institute for Pediatric Neuroscience at the NYU Child Study Center, New York, USA*

11:00
483 WTh-AM: Effect of DAT1 Genotype and ADHD Diagnosis on Task-Positive & Task-Negative Working Memory Networks
Ariel Brown, *Massachusetts General Hospital, Boston, MA, USA*

11:15
505 WTh-AM: Motivation and Methylphenidate Modulate Task-Related Default Mode Network Deactivation in ADHD
Elizabeth Liddle, *University of Nottingham, Nottingham, UK*

11:30
529 MT-AM: Morphometry of the Superior Frontal Cortex in Adolescent-Onset Psychosis
Joost Janssen, *Unidad de Adolescentes de Psiquiatría. Hospital General Universitario Gregorio Marañón. CIBERSAM, Madrid, Spain*

12:00 – 12:30
Auditorium (Level 0)

KEYNOTE LECTURE

Real Time Functional Connectivity Assessed Using Transcranial Magnetic Stimulation (TMS) Methods
John Rothwell, *University College London, London, UK*

In addition to creating "virtual lesions" that interfere with brain function, TMS also activates anatomical connections to distant areas. These produce their own EEG or BOLD signal changes, or modulate responses to a second TMS stimulus. The combination allows us to chart excitability changes in preparation for, and during, a task with millisecond precision.

12:30 – 13:30

POSTER SESSION

Exhibit Hall (Level 0)
#1-589 WTh-AM (Odd numbered posters present)
Brain Stimulation: TMS
Cognition and Attention: Attention (Auditory, Tactile, Motor), Attention (Visual), Cognitive Aging, Cognitive Development
Disorders of the Nervous System: Addiction, Alzheimer and Dementia, Autism, Brain and Spinal Cord Trauma, Developmental Disorders,
Emotion and Motivation: Decision Making, Emotional Learning

Multifunction Area (Level -1)
#591-1587 WTh-AM (Odd numbered posters present)
Emotion and Motivation: Emotional Perception
Genetics
Imaging Techniques and Contrast Mechanism: Anatomical MRI, Diffusion MRI, EEG, Functional MRI, MEG
Language: Comprehension, Language Acquisition
Memory and Learning: Learning (Explicit and Implicit), Long-term Memory (Episodic, Semantic, Autobiographical)
Modeling and Analysis: Bayesian Modeling, Bold fMRI, Classification and Predictive Modeling, Exploratory Methods, Artifact Removal, Flattening, Segmentation
Motor Behavior: Basal Ganglia/Brainstem/Spinal Cord, Brain-machine Interface, Eye Movements/ Visuomotor Processing
Neuroanatomy: Anatomical Studies
Pharmacology
Sensory Systems: Auditory/ Vestibular, Chemical Senses: Olfaction, Taste, Multisensory and Crossmodal

13:30 - 14:45

LUNCH

14:45 – 15:45

POSTER SESSION

Exhibit Hall (Level 0)

#2-588 WTh-PM (Even numbered posters present)
Brain Stimulation: TMS
Cognition and Attention: Attention (Auditory, Tactile, Motor), Attention (Visual), Cognitive Aging, Cognitive Development
Disorders of the Nervous System: Addiction, Alzheimer and Dementia, Autism, Brain and Spinal Cord Trauma, Developmental Disorders,
Emotion and Motivation: Decision Making, Emotional Learning

Multifunction Area (Level -1)

#590-1588 WTh-PM (Even numbered posters present)
Emotion and Motivation: Emotional Perception
Genetics
Imaging Techniques and Contrast Mechanism: Anatomical MRI, Diffusion MRI, EEG, Functional MRI, MEG
Language: Comprehension, Language Acquisition
Memory and Learning: Learning (Explicit and Implicit), Long-term Memory (Episodic, Semantic, Autobiographical)
Modeling and Analysis: Bayesian Modeling, Bold fMRI, Classification and Predictive Modeling, Exploratory Methods, Artifact Removal, Flattening, Segmentation
Motor Behavior: Basal Ganglia/Brainstem/Spinal Cord, Brain-machine Interface, Eye Movements/ Visuomotor Processing
Neuroanatomy: Anatomical Studies
Pharmacology
Sensory Systems: Auditory/ Vestibular, Chemical Senses: Olfaction, Taste, Multisensory and Crossmodal

16:00 - 17:15

ORAL SESSIONS

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J & H3 (Level -1)

O-Th4: Brain Stimulation

Chair: Hartwig Siebner, *Copenhagen University Hospital, Copenhagen, Denmark*

16:00
728 WTh-PM: Brain Circuit Mapping with Optogenetic Functional Magnetic Resonance Imaging (ofMRI)
Jin Hyung Lee, *University of California, Los Angeles, Los Angeles, CA, USA*

16:15
903 MT-AM: Non-invasive Plasticity Induction in a Cortical-Cortical Connection Pathway in Human Brain
Vanessa Johnen, *Department of Experimental Psychology, University of Oxford, UK, Oxford, UK*

16:30
456 MT-PM: Mapping Cortico-Subthalamic Coherence Using Simultaneous MEG and Intracranial Recordings
Vladimir Litvak, *University College London, Institute of Neurology, London, UK*

16:45
896 MT-PM: Transcranial Direct Current Stimulation (TDCS) Targeted Using Brain Imaging Accelerates Learning
Vincent Clark, *University of New Mexico and Mind Research Network, Albuquerque, NM, USA*

17:00
8 MT-PM: Abstinence Induced Craving Activity Influenced by tDCS: a pCASL Study
Thomas Fischer, *TU Dresden, Dresden, Germany*

Auditorium (Level 0)

O-Th5: Sensory Systems

Chair: Michael Beauchamp, *University of Texas Medical School at Houston, Houston, TX, USA*

16:00
1403 MT-AM: Open vs Hidden Opioid Administration: Belief Modulates Remifentanil Effects on Pain-Evoked Responses
Lauren Atlas, *Columbia University, Brooklyn, NY, USA*

ORAL SESSIONS, *continued*

16:15
1543 WTh-AM: Neural Processing of Odorant Stimuli by Early Blind Subjects
Mathilde Beaulieu Lefebvre, *University of Montreal, Montreal, Canada*

16:30
1562 WTh-PM: Bottom-Up or Top-Down: Connectivity Reflects Individual Differences in Grapheme-Color Synesthesia
Tessa van Leeuwen, *Radboud University Nijmegen, Donders Institute (RU/DI-BCB), Nijmegen, Netherlands*

16:45
1483 MT-AM: The Human MT/V5 Field Map Cluster
Hauke Kolster, *Lab for Neuro- and Psychophysiology, KU Leuven, Leuven, Belgium*

17:00
1072 WTh-PM: Gamma Band Representation of Amplitude and Frequency Modulation in Heschl's Gyrus
Paul Wai-Fung Poon, *National Cheng Kung University, Tainan, Taiwan, Republic of China*

H1 & 2 (Level -1)
O-Th6: Modeling and Analysis: Anatomy & Inter-Subject Variability
Chair: Bruce Fischl, *Massachusetts General Hospital, Boston, MA, USA*

16:00
1342 WTh-PM: Topological Correction of Brain Surface Meshes Using Spherical Harmonics
Rachel Yotter, *Structural Brain Mapping Group, Department of Psychiatry, University of Jena, Jena, Germany*

16:15
1318 WTh-PM: Processing Methods to Reduce Intersite Variability in fMRI
Douglas Greve, *Massachusetts General Hospital, Charlestown, MA, USA*

16:30
1314 WTh-PM: Explained Variance in Resting State FMRI by Brain Tissue Types
Hang Joon Jo, *National Institute of Mental Health, Bethesda, MD, USA*

16:45
946 WTh-PM: Calibrated fMRI using Fractional Volume of Gray Matter
Yihong Yang, *National Institute on Drug Abuse, Baltimore, MD, USA*

17:00
1379 WTh-AM: Diffeomorphic Sulcal Pattern Matching for Cortical Surface Registration
Shantanu Joshi, *University of California Los Angeles, Los Angeles, CA, USA*

17:30 - 18:30

CLOSING COMMENTS AND MEETING HIGHLIGHTS

Auditorium (Level 0)
Mark D'Esposito, *University of California-Berkeley, Berkeley, CA, USA*

18:30 – 19:30

FAREWELL POSTER RECEPTION

Exhibit Hall (Level 0)
#1-589 WTh-AM and WTh-PM (Wednesday and Thursday presenters)
Brain Stimulation: TMS
Cognition and Attention: Attention (Auditory, Tactile, Motor), Attention (Visual), Cognitive Aging, Cognitive Development
Disorders of the Nervous System: Addiction, Alzheimer and Dementia, Autism, Brain and Spinal Cord Trauma, Developmental Disorders,
Emotion and Motivation: Decision Making, Emotional Learning

Multifunction Area (Level -1)
#590-1588 WTh-AM and WTh-PM (Wednesday and Thursday presenters)
Emotion and Motivation: Emotional Perception
Genetics
Imaging Techniques and Contrast Mechanism: Anatomical MRI, Diffusion MRI, EEG, Functional MRI, MEG
Language: Comprehension, Language Acquisition
Memory and Learning: Learning (Explicit and Implicit), Long-term Memory (Episodic, Semantic, Autobiographical)
Modeling and Analysis: Bayesian Modeling, Bold fMRI, Classification and Predictive Modeling, Exploratory Methods, Artifact Removal, Flattening, Segmentation
Motor Behavior: Basal Ganglia/Brainstem/Spinal Cord, Brain-machine Interface, Eye Movements/ Visuomotor Processing
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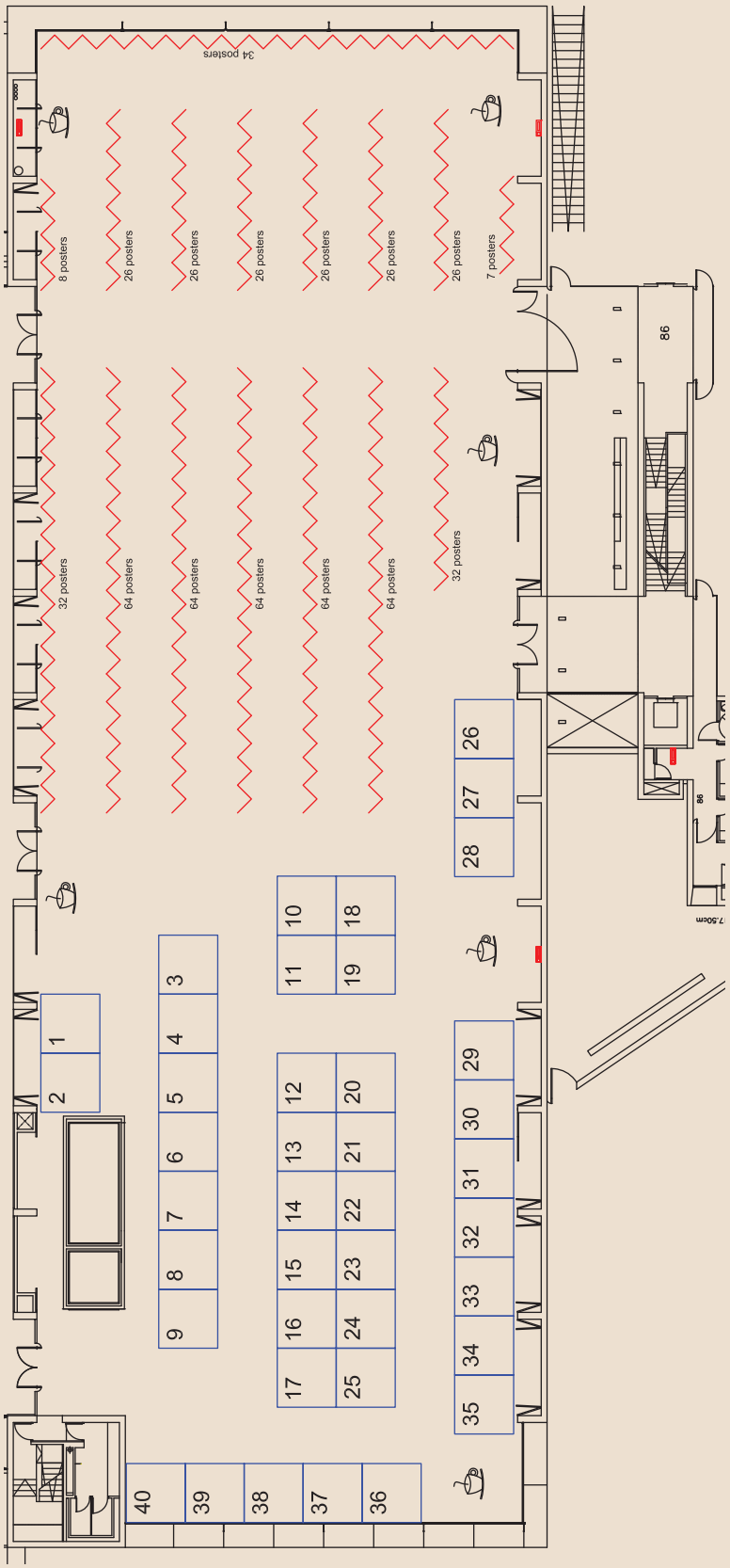

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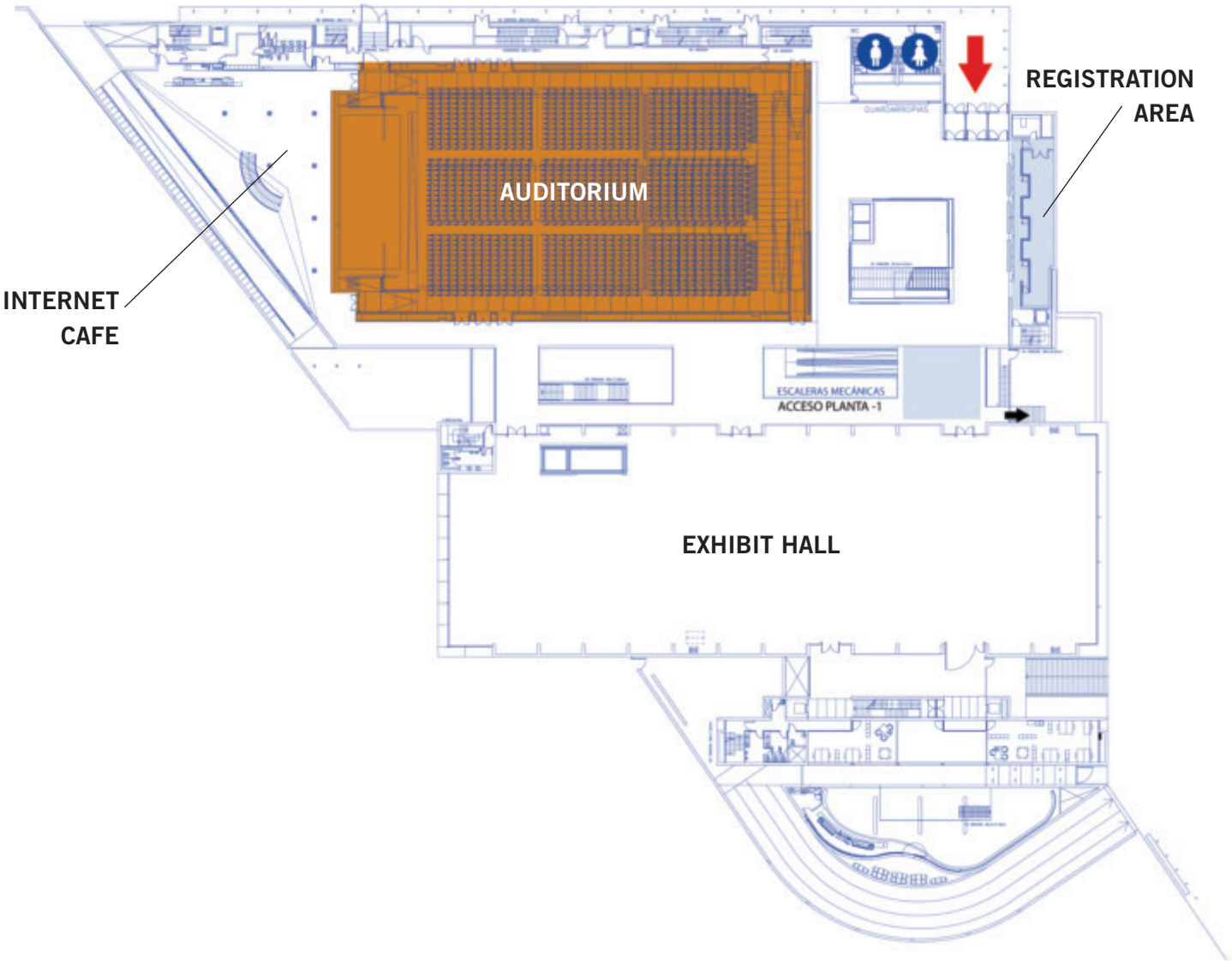
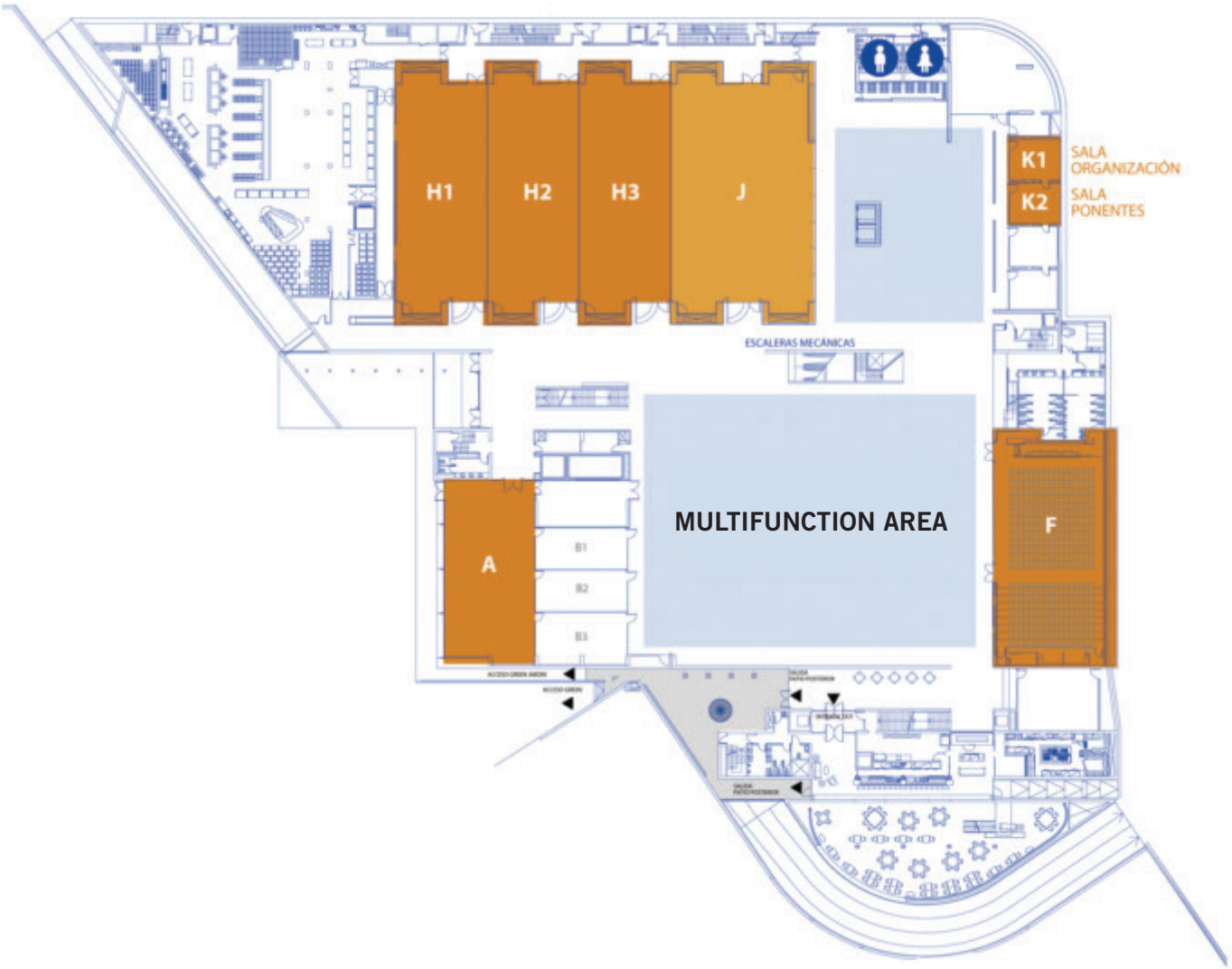
floor plan

LEVEL 0



floor plan

LEVEL-1



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