2017 OHBM VANCOUVER
June 25-29, 2017

23rd Annual Meeting of the
Organization for Human Brain Mapping

PROGRAM

June 25–29, 2017

Vancouver, British Columbia, Canada

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WELCOME

Welcome to Vancouver and the 23rd Annual Meeting of the Organization for Human Brain Mapping! It's an exciting time for OHBM and for the brain mapping community as we continue to grow – always remaining adaptable, motivated and responsive to the latest research and forward thinking ideas. The value gained by coming together as leaders in the field of neuroimaging to share our visions, knowledge, and experience is critical to paving the way into the future.

We have an impressive lineup of experts for our Talairach Lecture, Keynote presentations, and morning and afternoon symposia. The ever-popular poster presentations and Oral Sessions will not disappoint – exposing you to the latest and most cutting-edge research. Here is just a sampling of what you can expect:

- Talairach Lecturer Carla J. Shatz, PhD, Professor of Biology and Neurobiology, Director, Stanford Bio-X, Stanford University, United States will present *"Synapses lost and found: developmental critical periods and Alzheimer's Disease"*.
- Keynote lecturers including Damien Fair, Oregon Health and Science University; Kalanit Grill-Spector, Stanford University; Marsel Mesulam, Northwestern University Feinberg School of Medicine; Karla Miller, PhD, FMRIB Centre, University of Oxford; Kia Nobre, University of Oxford; Christian Ruff, University of Zurich; and Tal Yarkoni, University of Texas at Austin offering a diversity of topics discussing major themes in neuroimaging science and applications.
- Stimulating morning and afternoon symposia that will spur active audience discussion and participation.
- The popular LOC Symposium on Monday from 10.50 to 12.00H covering *"Myelin Water Imaging in Human Brain: Principles, Validation and Applications"* that will discuss the critical structural and functional component of white matter that allows rapid and effective information exchange in the brain.
- Interactive roundtable discussions on two important topics: 1) an overview of publishing trends with opportunities to hold open discussion with key journal editors on Monday starting at 12:00H; and 2) interactive mentoring roundtable hosted by the Student/Post Doc Special Interest Group on Wednesday at 12:00H.
- Social and networking opportunities with our exhibitors, sponsors, mentors and peers including the Student/Post Doc Special Interest Group social on Monday evening, Wednesday's legendary Club Night, and Tuesday and Thursday evening poster receptions.
- Hackathon activities hosted by the OHBM Open Science Special Interest Group with special programming offered throughout the meeting.

We would like to thank each of you for attending the OHBM meeting and bringing your expertise to our gathering. We look forward seeing you in Vancouver for what promises to be a most stimulating and enjoyable event.

Sincerely,

Alan Evans,
Chair, Council

Michael Greicius,
Chair, Program Committee

Lara Boyd and Doris Doudet
Co-Chairs, Local Organizing Committee

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OHBM 2017 PROGRAM-AT-A-GLANCE

Sunday, June 25

Educational Courses

Full Day Courses: 8:00 – 16:30
Advanced fMRI Course
Room: Ballroom AB

EEG and MEG Connectivity:
Basic Principles, State-of-the-art Methods,
and Emerging Vistas
Room: 205-207

MR Diffusion Imaging: From the Basics
to Advanced Applications
Room: 220-222

Pattern Recognition for Neuroimaging
Room: 211-214

Morning Courses 8:00 – 12:00
Brain Parcellations and Functional Terrories
Room: 202-204

Advanced Methods for Cleaning Up
fMRI Time-series
Room: 118-120

Brain graphs: An Introduction to Network
Analysis of Brain Imaging Data
Room: 109/110

Introduction to Imaging Genetics
Room: 217-219

Afternoon Courses 13:00 – 16:30
Why It All Comes Back to Anatomy
Room: 217-219

Neuroimaging Meta-Analysis
Room: 118-120

Practicalities for Reproducible Neuroimaging 2.0
Room: 202-204

Taking Connectivity to a Skeptical Future:
Challenges, Tools and Techniques
Room: 109/110

9:00 – 12:00
Open Science Special Interest Group
"Brain Hacking 101" Workshop
Room: 210 and Workspring Foyer

17:30 – 19:30
Opening Ceremonies and
Talairach Lecture
Room: Ballroom AB

Talairach Lecture: Carla Shatz, PhD
Synapses Lost and Found: Developmental Critical
Periods and Alzheimer's Disease

19:30 – 21:00
Welcome Reception
Ballroom C, D and West Pacific Terrace

Monday, June 26

8:00 – 9:15
Morning Symposia:
Method Validation in Functional MRI
Using Realistic Simulations
Room: Ballroom C

Large-scale Spatial Trends in Cortical Organization
Room: Ballroom AB

Uncovering Complexity with Long-term
Naturalistic Recordings
Room: 220-222

How Visual Experience Affects (or not) the Functional
Organization of the "Visual" Cortex
Room: 211-214

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15 minute break

9:30 – 10:15
Keynote Lecturer: Kalanit Grill-Spector, PhD
Brain Growth and the Development of Face Recognition
Room: Ballroom AB

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10 minute break

10:25 – 10:50
Best Paper Award Presentations
Room: Ballroom AB

10:50 – 12:00
LOC Symposium:
Myelin Water Imaging in Human Brain:
Principles, Validation and Applications
Room: Ballroom AB

12:00 – 12:45 Lunch

Philips Lunch Symposium: 12:00 – 14:30
Room: 220-222

Publishers Roundtable: Exploring the
Landscape of Publishing
Room: 211-214

12:45 – 14:45
Poster Session: Poster Numbers #1000-2222
Authors with even numbered posters will
present their posters today.
Exhibit Hall, Lower Level

14:45 – 16:00
Afternoon Symposia:
Predicting the Future: Multivariate Models of
Brain-ageing in Health and Disease
Room: Ballroom C

Multimodal Functional Cartography:
From Connectivity to Cognition
Room: Ballroom AB

Inferring Brain-computational Mechanisms by
Testing Representational Models
Room: 211-214

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15 minute break

16:15 – 17:00
Keynote Lecture: Tal Yarkoni, PhD
Threats to Valid Inference with fMRI: a Primer
Room: Ballroom AB

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15 minute break

17:15 – 18:30
Oral Sessions
Acquisition Methods / *Room: Ballroom AB*
Perception and Attention / *Room: Ballroom C*
Informatics / *Room: 211-214*
Psychiatric Disorders / *Room: 220-222*

Tuesday, June 27

8:00 – 9:15
Morning Symposia:
Collect Your Thoughts: Individual Differences in the
Networks Underlying Intelligence
Room: Ballroom C

High Resolution fMRI via Multiband (SMS) Acquisition:
Opportunities and Limitations
Room: Ballroom AB

Connectomic Insights Into Brain Development Before Birth
Room: 211-214

Neuroplasticity: In Search for Cellular Mechanisms Underlying
Changing Cognition Using Imaging
Room: 220-222

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15 minute break

9:30 – 10:15
Keynote Lecturer: Karla Miller, PhD
Bridging Scales with Neuroimaging: Challenges and Opportunities
Room: Ballroom AB

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15 minute break

10:30 – 11:45
Oral Sessions:
Anatomy and Physiology / *Room: 220-222*
Brain Stimulation and Behavior / *Room: Ballroom C*
Emotion and Motivation / *Room: 211-214*
Modeling and Analysis / *Room: Ballroom AB*

11:45 – 12:45 Lunch

12:00 – 14:30
EGI Lunch Symposium
Room: 220-222

12:45 – 14:45
Poster Session: Poster Numbers #1000-2223
Authors with odd numbered posters will
present their posters today.
Exhibit Hall 1, Lower Level

14:45 – 16:00
Afternoon Symposia:
Translational Functional Neuroimaging: from
Animal Models to Humans and Back Again
Room: 211-214

Large-Scale Brain Networks and Substance Use Disorders
Room: Ballroom C

Brain Imaging in Huge Population-level Epidemiological Studies
Room: Ballroom AB

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15 minute break

16:15 – 17:00
Keynote Lecture: Damien Fair, PA-C, PhD
Early Influences on the Developmental Trajectory
of the Functional Connectome
Room: Ballroom AB

17:00 – 18:30
Poster Reception
Poster Numbers #1000-2223
Exhibit Hall, Lower Level

Wednesday, June 28

8:00 – 9:15
Morning Symposia:
25 years of BOLDly going: What does the next quarter century hold for fMRI?
Room: 211-214

The Neuroethical Implications of Human Brain Mapping
Room: 220-222

Multi-echo fMRI: Basics, Denoising, and Applications to Neuroscience
Room: Ballroom C

Relating Connectivity to Inter- and Intra-individual Differences in Attention and Cognition
Room: Ballroom AB

15 minute break

9:30 – 10:15
Keynote Lecture: Marsel Mesulam, MD
Revisiting Wernicke's Area
Room: Ballroom AB

15 minute break

10:30 – 11:45
Oral Sessions:
Brain Organization for Language / *Room: 211-214*
Connectivity Methods and Analysis / *Room: Ballroom AB*
Learning and Memory / *Room: Ballroom C*
Social Neuroscience / *Room: 220-222*

11:45 – 12:45 Lunch

12:00 – 14:30
Siemens Lunch Symposium
Room: 220-222

Student/Postdoc SIG Roundtable: Mentorship and Career Development Symposium: Key Factors to Consider for Career Evolution In Neuroimaging
Room: 211-214

12:45 – 14:45
Poster Session: Poster Numbers #3000-4260
Authors with even numbered posters will present their posters today.
Exhibit Hall, Lower Level

14:45 – 16:00
Afternoon Symposia:
Systems-level Integration of Neuroimaging and Genomic Maps in Health and Disease
Room: Ballroom AB

Validating MRI-based Biophysical Models with Gold Standard Histology: Potentials and Limitations
Room: 211-214

Exploring Complex Relationships Between Evoked and Intrinsic Brain Activity
Room: Ballroom C

15 minute break

16:15 – 17:00
Keynote Lecture: Christian Ruff, PhD
Multiple Brain Systems for Decision Making?
Ballroom AB

15 minute break

17:15 – 18:15
Town Hall Forum
Room: Ballroom AB

20:00 – 2:00
Club Night
Science World

Thursday, June 29

8:00 – 9:15
Morning Symposia:
Interaction of Neuronal Oscillations in Multiple Spatio-temporal Scales: From Methods to Cognition
Room: 211-214

Near and Far: Imaging the Remote Effects of Ischemic Stroke and Cerebrovascular Disease Burden
Room: Ballroom C

Individualized Mapping and Causal Manipulation of Human Brain Circuits
Room: Ballroom AB

Brain-to-brain Synchrony Early in Life: What Can We Learn From Different Hyperscanning Techniques?
Room: 220-222

15 minute break

9:30 – 10:15
Keynote Lecture: Kia Nobre
Preperception in the Human Brain
Ballroom AB

15 minute break

10:30 – 11:45
Oral Sessions:
Higher Cognitive Functions / *Room: Ballroom C*
Imaging Methods / *Room: Ballroom AB*
Lifespan Development / *Room: 220-222*
Neurological Disorders / *Room: 211-214*

11:45 – 12:45 Lunch

12:45 – 14:45
Poster Session: Poster Numbers #3000-4261
Authors with odd numbered posters will present their posters today.
Exhibit Hall, Lower Level

14:45 – 16:00
Closing Comments and Meeting Highlights
Room: Ballroom AB

16:00 –17:30
Farewell Poster Reception
Poster Numbers #3000-4261
Exhibit Hall, Lower Level

GENERAL INFORMATION

CONFERENCE VENUE

Vancouver Convention Centre
West Building, 1055 Canada Place
Vancouver, BC V6C 0C3, Canada

All events will take place at the convention centre unless otherwise noted.

REGISTRATION HOURS

Ballroom Lobby, Level 1

Saturday, June 24: 15:00 – 18:00
Sunday, June 25: 7:00 – 19:30
Monday, June 26: 7:30 – 17:00
Tuesday, June 27: 7:30 – 15:00
Wednesday, June 28: 7:30 – 15:00
Thursday, June 29: 7:30 – 15:00

EXHIBIT HOURS

Exhibition Hall, Lower Level

Monday, June 26: 11:00 – 16:00
Tuesday, June 27: 11:00 – 18:30
Wednesday, June 28: 11:00 – 16:00
Thursday, June 29: 11:00 – 17:30

WELCOME RECEPTION

Sunday, June 25, 19:00 – 21:00
Ballroom C, D and West Pacific Terrace

Join us for the 2017 Annual Meeting Welcome Reception. The reception will be held at the Vancouver Center immediately following the Opening Ceremonies and Talairach Lecture on Sunday, June 25th. **Please make sure to wear your name badge, which will serve as your ticket to the event.** Additional guest badges are $50.00 USD.

8TH ANNUAL NEUROBUREAU AND OHBM STUDENT/POSTDOC SIG GALA OPEN SCIENCE BLOCK PARTY

901/957/958 Granville Street

Monday, June 26
OHBM badge needed for admission and free drink.
Student and Postdocs: 19:00 – 1:00
All OHBM Attendees: 20:00 – 1:00

We are excited to present this year's "Open Science Block Party", featuring three outstanding venues in the heart of downtown Vancouver: the Granville Room, the Cinema Public House and the Republic Nightclub.

* 2017 Brain-Art competition winners will be announced.

CLUB NIGHT

Wednesday, June 28, 20:00 – 2:00
Science World

OHBM's legendary Club Night promises to be another don't-miss event as we go to the Science World at TELUS World of Science! This unique venue is located on the beautiful False Creek and is easily accessible via transit to the Main Street-Science World Train Station or via Aquabus/False Creek ferries. There will be a DJ "Girl on Wax" that will play dance music throughout the evening, and you can access all the hands-on activities the Science World as to offer. Don't miss the food trucks that will offer a variety of foods for purchase from Thai' to the famous Vancouver Poutine!

The party is complimentary to registrants. **Please make sure to bring your ticket to Club Night.** Additional guest tickets are $50.00 and must be purchased at the conference registration desk.

Address: 1455 Quebec Street, Vancouver

INDUSTRY SPONSORED LUNCH SYMPOSIA

Monday, June 26
Philips
Elevate Neuro Diagnostics
12:00 – 14:30
Room 220-222, Level 2

Tuesday, June 27
EGI
High-resolution Electrical Head Mo
for Dense Array Neuromodulation
12:00 – 14:30
Room 220-222, Level 2

Wednesday, June 28
Siemens Healthineers
The Human Connectome: Constantly Exceeding the Possible – Pioneering MRI
12:00 – 14:30
Room 220-222, Level 2

TOWN HALL FORUM

Wednesday, June 28, 17:15 – 18:15
Room AB

The Town Hall Forum is the top source for the latest breaking news and commentary on issues impacting the neuroimaging community and your member organization. It is also an opportunity for you to voice your opinions and questions to the Council – which helps shape future agendas. The new elected leadership will be announced as well as dates and venues for future Annual Meetings.

ABSTRACT / POSTER LISTING BOOK

The abstract / poster listing book is available via electronic access only on the OHBM website **www.humanbrainmapping.org/2017Posters**. Posters are searchable by author and category in the mobile app.

SPEAKER READY ROOM

Room 103/104, Level 1

Hours:
Saturday, June 24: 15:00 – 18:00
Sunday, June 25: 7:00 – 19:00
Monday. June 26: 7:00 – 19:05
Tuesday, June 27: 7:00 – 18:00
Wednesday, June 28: 7:00 – 18:00
Thursday, June 29: 7:00 – 16:00

INTERNET CAFÉ / CHARGING STATION

Ballroom Foyer, Level 1

A limited number of complimentary terminals and power outlets will be available. Please limit your time at a terminal to 15 minutes.

Hours:
Saturday, June 24: 15:00 – 18:00
Sunday, June 25: 7:00 – 19:30
Monday. June 26: 7:30 – 17:00
Tuesday, June 27: 7:30 – 17:00
Wednesday, June 28: 7:30 – 17:00
Thursday, June 29: 7:30 – 15:00

OHBM ART EXHIBIT / LEVELS OF THOUGHT: FROM MICRO TO MACRO TO META

Ballroom Foyer, Level 1, near the West Pacific Terrace

Over the past seven years, the Neuro Bureau art exhibition held at the annual meeting of the Organization for Human Brain Mapping has become an important component of the event experience, contributing to its unique and developing character. This year's curated art exhibition will feature pieces by established artists and scientists, representing the various levels of thought through which one can appreciate the beauty of the human brain.

While images of brain tissue at the microscopic level have been appreciated for their raw aesthetic beauty since the late 19th century drawings of Ramon y Cajal, modern neuroimaging techniques have provided the opportunity to produce equally stunning images depicting the brain's incredible complexity at the macroscopic level, as well as adding dimensionality by often encompassing information about both space and time. Levels of Thought: From micro to macro to meta will showcase the beauty of the brain seen through various lenses, from the human eyes of artists and scientists to the micro- and macro-scale views of the tools we use to study its structure.

The exhibition will include pieces by artists including Elizabeth Jameson (known for her work inspired by her personal journey with Multiple Sclerosis), Richard Bright (artist and editor of Interalia magazine), Nathalie Regard (Mexico City based artist whose intriguing work exploring dreams has been displayed at several previous OHBM art exhibitions), and Greg Dunn (neuroscientist and artist known for stunning handmade lithographs), as well as contributions by members of the OHBM community. The exhibition will be on display in the foyer of the Vancouver Convention Center throughout the conference. Please come by and experience the brain through a different lens.

2017 OHBM OPEN SCIENCE SPECIAL INTEREST GROUP HACKATHON – JUNE 25-29, 2017

The 2017 OHBM Open Science Special Interest Group Hackathon took place June 25-29 at the Walter Gage residence. The goal of the hackathon was to bring together researchers with disparate backgrounds from the OHBM community to collaborate on open science projects in neuroimaging. The spirit of the hackathon will also be continuing into the OHBM meeting at the Vancouver Convention Centre from June 25-29, where a collaboration space (Room 210 and Workspring Foyer are on level 2) will be available in the conference venue. This space will host a series of reports on hackathon projects, as well as a demonstration of computational and communication tools for open science. The hackathon was made possible by the generous support of MCIN (McGill Centre for Integrative Neuroscience), Open fMRI, INCF (International Neuroinformatics Coordinating Facility) and the Organization for Human Brain Mapping.

Organizers

Pierre Bellec, Centre de recherche Institut Universitaire de gériatrie de Montréal, Department of Computer Science and Operations Research, University of Montreal, Montreal, Quebec, Canada

Cameron Craddock, Nathan Kline Institute and Child Mind Institute, New York, NY, United States

Greg Kiar, McGill Centre for Integrative Neuroscience, McGill University, Quebec, Canada

Daniel Margulies, Max Plank Institute for Cognitive and Brain Sciences, Leipzig, Germany

Nolan Nichols, Genentech, San Francisco, CA, United States

Jean-Baptiste Poline, Helen Wills Neuroscience Institute, University of California, Berkley, CA, United States

GENERAL INFORMATION

2017 OHBM OPEN SCIENCE SPECIAL INTEREST GROUP "OPEN SCIENCE ROOM"

Open daily June 25-29 from 8:00 – 19:00

Room 210 and Workspring Foyer are on level 2

The Open Science SIG has organized an "Open Science Room" (Room 210 and Workspring Foyer are on level 2) that will be available throughout the conference to support open collaboration. Come by for demonstrations of open science tools, to learn about how you can support open science, or to find a space to interact with your colleagues. See below for daily schedule of events or check the mobile app.

Demos	The Neuroimaging Informatics Tools and Resources Clearinghouse nitrc.org	Nina Preuss	Mon, June 26	10:20 – 10:35
	LORIS neuroimaging database	Samir Das	Mon, June 26	10:35 – 10:50
	GPU enabled image processing and non-parametric inference using BROCCOLI	Anders Eklund	Mon, June 26	12:45 – 13:15
	Mining the neuroimaging literature with neuroSynth.org	Alejandro de la Vega	Mon, June 26	13:15 – 13:45
	What's new in Freesurfer	Lilla Zollei	Mon, June 26	13:45 – 14:15
	Robust & reproducible pipelines for functional connectomics with niak.simexp-lab.org	Pierre Bellec	Mon, June 26	14:15 – 14:45
	Collaborative Informatics and Neuroimaging Suite Toolkit for Anonymous Computation (COINSTAC)	Vince Calhoun	Tues, June 27	12:45 – 13:25
	Science in the Cloud (SIC): A use-case in MRI connectomics	Greg Kiar	Tues, June 27	13:25 – 14:05
	Distributions for efficient and reproducible research (NeuroDebian/DataLad)	Yaroslav Halchenko	Tues, June 27	14:05 – 14:45
	Statistical power calculation in neuroimaging using neuropowertools.org	Joke Durnez and Jeannette Mumford	Thu, June 29	10:30 – 11:00
	Organize your neuroimaging and behavioural data with bids.neuroimaging.io	Cyril Pernet	Thu, June 29	11:00 – 11:30
	Sharing your brain maps with neurovault.org	Chris Gorgolewski	Thu, June 29	11:30 – 12:00
	SCT: Spinal Cord Toolbox, an open-source software for processing MRI, fMRI and DTI of the spinal cord	Julien Cohen-Adad	Thu, June 29	12:45 – 13:15
	Simulating the volume of activated tissue for electrical and magnetic stimulation using SimNIBS	Alex Opitz	Thu, June 29	13:15 – 13:45
	Open science resources for mapping the human connectome: C-PAC and the Preprocessed Connectomes Project	Cameron Craddock	Thu, June 29	13:45 – 14:15
	Quality control and preprocessing using MRIQC and FMRIPREP	Oscar Esteban	Thu, June 29	14:15 – 14:45
Open communication	Tweeting for Science: enhancing your research network in 140 characters	Kirstie Whitaker	Tues, June 27	17:00 – 17:15
	How would we communicate science if there were no practical constraints?	Tal Yarkoni	Tues, June 27	17:15 – 17:30
	Openly talking about scientists communicating science to non-scientists	Kevin Weiner	Tues, June 27	17:30 – 17:45
	Increasing the SNR in science communication	Nikola Stikov	Tues, June 27	17:45 – 18:00
SIG meeting	Report on recent and future activities of the SIG - open discussion with the community.	open SIG committee	Mon, June 26	17:30 – 18:30
Hackathon projects	Report on hackathon projects	TBD	Tues, June 27	10:30 – 11:45

OHBM ONDEMAND

OHBM OnDemand is an online portal designed to provide you with access to educational resources dedicated to those using neuroimaging to discover the organization of the human brain. Access videos, audio and PPT presentations from the quality scientific educational offerings during this year's meeting (as well as from the 2013-2016 OHBM Annual Meetings). OHBM OnDemand is provided at no charge to those that attended the meeting. 2017 Annual Meeting materials will be posted within three weeks after the conclusion of the meeting. An announcement will be sent to all attendees announcing its availability.

MOBILE APP

The 2017 Mobile App, powered by EventLink and created by Core-Apps LLC, is a native application for smartphones (iPhone and Android), a hybrid web-based app for Blackberry, and there's also a web-based version of the application for all other web browser-enabled phones.

How to Download:
For iPhone (plus, iPod Touch & iPad) and Android phones: Visit your App Store or Android Market on your phone and search for OHBM.

For All Other Phone Types (including BlackBerry and all other web browser-enabled phones): While on your smartphone, point your mobile browser to **http://m.core-apps.com/ohbm2017**. From there you will be directed to download the proper version of the app for your particular device, or, on some phones, you simply bookmark the page for future reference.

ONSITE CAREER RESOURCES

Back by popular demand! OHBM has created an electronic board at **www.humanbrainmapping.org/2017Career** where PIs can post positions available notices (under "Job Openings") and individuals can post CVs (under "People Looking for Jobs") before and during the meeting. We recommend using the main lobby and foyer areas to meet with prospective employers or employees.

SOCIAL MEDIA

Twitter: @OHBM, hash tag **#OHBM2017**
Facebook: Organization for Human Brain Mapping
Facebook Student Post Doc: Organization for Human Brain Mapping –Student and Postdoc Section
LinkedIn: Organization for Human Brain Mapping

E-POSTERS

All poster presenters are encouraged to upload an electronic version of their poster (E-poster) as a pdf. To access E-Posters, please go to **https://ww5.aievolution.com/hbm1701/**

WIRELESS CONNECTION

Wireless connections will be available throughout the Vancouver Convention Centre. Connect to OHBM Conference 2017.
No password is required.

EVALUATIONS

Please take a moment to utilize the rating system located on the mobile app. You can rate a session by selecting the clipboard icon on the left menu of an event. Individual evaluations will be sent for the Educational Courses and an overall Annual Meeting evaluation will be sent on June 29, 2017. 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 rate the sessions and complete the quick survey.

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 29.50 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 onsite or online on the OHBM website.**

EDUCATIONAL COURSES	**CREDITS**
Full Day Educational Courses 8:00 – 14:30	7.00 each
Morning Educational Courses 8:00 – 12:00	7.00 each
Afternoon Educational Courses 13:00 – 14:30	3.50 each
Maximum number of possible credits earned at Educational Courses	**7.00**

ANNUAL MEETING CREDITS	
Talairach Lecture	0.75
Keynote Lectures	0.75 each
Symposia	1.25 each
Oral Sessions	1.25 each
LOC Symposium	1.25
Meeting Highlights	1.00
Town Hall Forum	0.50
Total number of possible credits earned at Annual Meeting	**22.50**
TOTAL NUMBER OF POSSIBLE CREDITS	**29.50**

Advanced fMRI Course

Full Day Course / 8:00 – 16:30

Room: Ballroom AB

Organizers:

Tor Wager, Department of Psychology and Neuroscience, University of Colorado at Boulder, Boulder, CO, United States

Niko Kriegeskorte, Cambridge, Cambridge, United Kingdom

FMRI acquisition and analysis is a rapidly advancing field. Analysis techniques are becoming increasingly specialized, which has given rise to the development of sub-fields like "resting-state analysis", "connectomics", "graph theory", "simultaneous multi-slice imaging", "machine learning", "pattern information", "processing pipelines", "translational neuroscience", and others. There are substantial concerns about reproducibility, power and effect size, and best practices in neuroimaging analysis and beyond. While a deep dive into any one of these particular topics is a worthy venture, this course provides something complementary: A broad update of the latest thinking and most important concepts across all of these areas. We feel that this is an essential component of OHBM's educational mission.

Course Schedule:

8:00 – 8:35

MRI and fMRI physics: From basic principles to the current state of the art

Lawrence Wald, PhD, Athinoula A. Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Boston, MA

8:35 – 9:10

The Physiology and Spatial Specificity of fMRI: Implication for High-Resolution fMRI and fMRI-Based Decoding

Amir Shmuel, MNI, McGill University, Montreal, Canada

9:10 – 9:45

Neuromodulation during fMRI

Gary Glover, Stanford University, Palo Alto, CA, United States

9:45 – 10:20

Classics and Trendy

Robert Cox, National Institute of Mental Health, NIH, Bethesda, MD, United States

10:20 – 10:50

Break

10:50 – 11:25

Best practices in data analyses and sharing, the COBIDAS document: Tips for application with examples from a large population-based study

Tonya White, MD, PhD, Erasmus MC - Sophia Children's Hospital, Rotterdam, The Netherlands

11:25 – 12:00

Questions and Answers

12:00 – 13:00

LUNCH

13:00 – 13:35

Establishing causal relationships in neuroimaging: Pitfalls and promises

Martin Lindquist, PhD, Johns Hopkins, Baltimore, MD, United States

13:35 – 14:10

Theoretical and Statistical Interpretation of fMRI Multivariate Pattern Analysis

Mike Pratt, Mississippi State University, Starkville, MS, United States

14:10 – 14:50

Stimulus-locked network dynamics

Chris Honey, Johns Hopkins University, Baltimore, MD, United States

14:50 – 15:00

BREAK

15:00 – 15:35

Reproducibility, Effect size, and Generalizability in Neuroimaging

Tor Wager, Department of Psychology and Neuroscience, University of Colorado at Boulder, Boulder, CO, United States

15:35 – 16:10

Translational fMRI: Data-Driven Modeling of Brain-Behavior Associations in Neuropsychiatric Disorders

Conor Liston, MD, PhD, Cornell University, New York, NY, United States

16:10 – 16:30

Questions and Answers

EEG and MEG Connectivity: Basic Principles, state-of-the-art methods, and emerging vistas

Full Day Course / 8:00 – 16:30

Room: 205-207

Organizers:

Laura Astolfi, Department of Computer, Control, and Management Engineering, Rome, Italy

Thomas Koenig, Department of Psychiatric Neurophysiology University Hospital of Psychiatry, Bern, Switzerland

The human brain imaging community is increasingly adopting connectivistic views for many more complex psychobiological processes. Electroencephalographic (EEG) and Magnetoencephalographic (MEG) signals directly result from temporally

coherent neural activity, and naturally distinguish processes organized in time and frequency. However, the physics of these signals can entail possible fallacies in the connectivity analysis, which must be avoided. This full-day educational course will give a comprehensive overview on the current state-of-the-art of analysis of EEG- and MEG-based connectivity. After introducing the physical background of EEG and MEG signals and the currently available models for source imaging and signal decomposition, we will present the established methods and emerging views to come to integral and multiscale accounts of brain functional connectivity within and across measurement modalities, such as cross-frequency interactions and scale-free dynamics. Particular care will be taken to make the audience aware of their possibilities to employ robust and state-of-the-art connectivity methods for basic and clinical applications.

Course Schedule:

8:00 – 8:20

Introduction

Thomas Koenig, Department of Psychiatric Neurophysiology University Hospital of Psychiatry, Bern, Switzerland

8:20 – 8:50

Temporal dynamics of EEG microstates

Christoph Michel, Neuroscience Department of the Medical Faculty and Center for Biomedical Imaging, University of Geneva, Geneva, Switzerland

8:50 – 9:20

Electrophysiological Source Imaging – Solving the Inverse Problem

Bin He, Institute for Engineering in Medicine, Department of Biomedical Engineering, University of Minnesota, Minneapolis, MN, United States

8:20 – 9:50

Noninvasive modeling of brain dynamic connectivity

Scott Makeig, Swartz Center for Computational Neuroscience Institute for Neural Computation University of California, San Diego, CA, United States

9:50 – 10:20

Brain connectivity inference through multivariate time series: advances, pitfalls and applications

Laura Astolfi, Department of Computer, Control, and Management Engineering, Rome, Italy

10:20 – 10:40

BREAK

10:40 – 11:10

Which tool should I use for connectivity in neuroelectrical imaging?

Daniele Marinazzo, University of Ghent, Ghent, Belgium

11:10 – 11:40

Fact and Fallacy EEG Source Connectivity

Pedro Valdes-Sosa, Joint Cuba/China Laboratory for Neurotechnology Cuban Neuroscience Center/University of Electronic, Chengdu, China

11:40 – 12:00

Questions and Answers

12:00 – 13:00

LUNCH

13:00 – 13:30

Connectivity in epilepsy: characterization of pathological networks on MEG and intracerebral EEG

Christian Benar, INSERM UMR1106, Marseille, France

13:30 – 14:00

Connectivity in ERP analyses

Daniel Brandeis, Child and Adolescent Psychiatry, Central Institute of Mental Health, University of Heidelberg, Mannheim, Germany

14:00 – 14:30

Large-scale network synchronization in ongoing brain activity: relation between non-invasive electrophysiological and hemodynamic data

Laura Marzetti, University of Chieti-Pescara, Chieti, Italy

14:30 – 14:50

BREAK

14:50 – 15:20

Understanding the prevalent arrhythmic brain activity and its implications for connectivity analyses

Biyu He, New York University Langone Medical Center, New York, NY, United States

15:20 – 15:50

Estimation of large-scale network synchronization and cross-frequency interactions from electrophysiological data

Satu Palva, Neuroscience Center, University of Helsinki, Helsinki, Finland

15:50 – 16:20

Mechanisms & dynamical structure of brain rhythms: from rest to perception

Sylvain Baillet, McGill University, Montreal, Quebec, Canada

16:20 – 16:30

Questions and Answers

MR Diffusion Imaging: From the Basics to Advanced Applications

Full Day Course / 8:00 – 16:30

Room: 220-222

Organizers:

Flavio Dell'Acqua, King's College London, London, United Kingdom

Anton Beer, Universität Regensburg, Regensburg, Germany

Alfred Anwander, Max Planck Institute, Leipzig, Germany

Diffusion Imaging is a non-invasive MRI technique that is sensitive to the diffusion of water molecules. As molecular diffusion is restricted by cell structures (e.g., membranes), it allows inferences about the microstructural organization of the brain. Moreover, tractography reconstructions based on Diffusion Imaging can reveal patterns of structural connectivity in cortical and subcortical brain regions. Limitations on spatial resolution, sensitivity to the diffusion process (low b-values), and orientation sampling have limited its full potential to study the human brain until few years ago. Thanks to recent technological developments, a new generation of MR scanners are now available that are able of collecting data at much higher spatial and angular resolution, much faster and with stronger diffusion contrasts or stronger b-values. These technological advancements have opened the door to new and more sophisticated analysis procedures making diffusion imaging today a very fast evolving neuroimaging field.

Course Schedule:

8:00 – 8:30

Diffusion MRI data acquisition

Jennifer Campbell, McGill University, Montreal, Canada

8:30 – 9:00

Methodological considerations on analyzing diffusion MRI data

Alexander Leemans, Image Sciences Institute, University Medical Center Utrecht, Utrecht, The Netherlands

9:00 – 9:30

Diffusion Imaging Models 1: from DTI to HARDI models

Flavio Dell'Acqua, King's College London, London, United Kingdom

9:30 – 10:00

Diffusion Imaging Models 2: from DTI to microstructure quantification

Els Fieremans, Center for Biomedical Imaging, New York, NY, United States

10:00 – 10:30

BREAK

10:30 – 11:00

Post Mortem and Preclinical Diffusion Imaging

Tim Dyrby, Danish Research Centre for Magnetic Resonance, Copenhagen, Denmark

11:00 – 11:30

Diffusion Tractography

Maxime Descoteaux, University of Sherbrooke, Sherbrooke, Quebec

11:30 – 12:00

Questions and Answers

12:00 – 13:00

LUNCH

13:00 – 13:30

Group Comparison using Diffusion Imaging and application to brain plasticity

Anton Beer, Universität Regensburg, Regensburg, Germany

13:30 – 14:00

Connectomics analysis and Parcellation of the brain based on diffusion-weighted fiber tractography

Alfred Anwander, Max Planck Institute, Leipzig, Germany

14:00 – 14:30

Combining quantitative MRI measures to model brain development

Jason Yeatman, University of Washington, Seattle, WA, United States

14:30 – 15:00

BREAK

15:00 – 15:30

Methods for combining structural and functional connectivity

Fernando Calamante, The Florey Institute of Neuroscience and Mental Health, Melbourne, Australia

15:30 – 16:00

Diffusion Anisotropy – Historical Perspective, Research Utility and Clinical Challenges

Christian Beaulieu, University of Alberta, Edmonton, Canada

16:00 – 16:30

Questions and Answers

Pattern Recognition for NeuroImaging

Full Day Course / 8:00 – 16:30

Room: 211-214

Organizers:

Christophe Phillips, University of Liège, Liège, Belgium

Janaina Mourao-Miranda, PhD, Max Planck UCL Centre for Computational Psychiatry and Ageing Research, London, United Kingdom

The application of pattern recognition techniques to neuroimaging data has increased substantially over the last years leading to a large body of publications. Pattern recognition approaches consist of a whole

family of tools coming from the "machine learning" community (at the border of statistics and engineering), which have been adapted to investigate neuroscience questions. Depending on the research question asked, experimental design and data modality, it is important that the experimenter knows which tools to use and how to draw reliable conclusions. The course will focus on subject and/or patient classification (for cognitive and clinical applications) but also on regression issues. The usual functional and structural MRI modalities will be covered but the presentations will also consider other types of data. Model validation and statistical inference are particularly crucial as these notions somewhat differ from the standard univariate statistics usually applied to analyze neuroimaging data (e.g. General Linear Model) and should thus be specifically addressed. After introducing the theoretical foundations of pattern recognition in neuroimaging, a few talks will address key validation and inference issues. Then the remaining talks will introduce more advanced methodological points as illustrated by specific applications and/or modalities. At the end of the course, the neuroscientist should have a global understanding of pattern recognition approaches, how to apply these tools to his/her own data to address new questions, and how to interpret the outcomes of these analyses as well as how to draw reliable conclusions.

Course Schedule:

8:00 – 8:35
Pattern recognition fundamentals
Christophe Phillips, University of Liège, Liège, Belgium

8:35 – 9:05
Cross-validation to assess and tune decoders
Pradeep Reddy Raamana, Rotman Research Institute, Baycrest Health Sciences, Ontario, Canada

9:05 – 9:40
A primer on permutation testing (not only) for MVPA.
Carsten Allefeld, Charité - Universitätsmedizin Berlin, Berlin, Germany

9:40 – 10:15
Can we interpret weight maps in terms of cognitive/ clinical neuroscience?
Jessica Schrouff, Stanford University, Palo Alto, CA, United States

10:15 – 10:30
BREAK

10:30 – 11:05
A new MVPA-er's guide to fMRI datasets
Jo Etzel, PhD, Washington University in St. Louis, Saint Louis, MO, United States

11:05 – 11:40
What makes a good multivariate model for fMRI-based decoding?
Bertrand Thirion, Inria, Saclay, France

11:40 – 12:00
Questions and Answers

12:00 – 13:00
LUNCH

13:00 – 13:35
Matching and Studying Multivariate Patterns across Individuals
Georg Langs, Medical University of Vienna, Vienna, Austria

13:35 – 14:05
Learning from multimodal data for disease prediction
Olivier Colliot, ICM, Paris, Paris, France

14:05 – 14:40
Pattern recognition and neuroimaging in psychiatry
Janaina Mourao-Miranda, PhD, Max Planck UCL Centre for Computational Psychiatry and Ageing Research, London, United Kingdom

14:40 – 15:00
BREAK

15:00 – 15:35
Deep learning approaches applied to Neuro-Imaging
Vince Calhoun, The Mind Research Network, Albuquerque, NM, United States

15:35 – 16:05
Interpretation of MVPA models
Moritz Grosse-Wentrup, Max Planck Institute for Intelligent Systems, Tuebingen, Germany

16:05 – 16:30
Questions and Answers

Brain parcellations and functional territories

Half Day Morning Course / 8:00 – 12:00
Room: 202-204
Organizers:
Michel Thiebaut de Schotten, Brain Connectivity and Behaviour Group, Paris, France

Matthew Glasser, Washington University in St. Louis, St. Louis, MO, United States

Over the past century and an half, human brain mapping consisted in pinning small functionally responsive areas within the brain. However the real extent of these areas and their eventual overlap remains unknown. The challenge now facing neuroscience is to define boundaries for functionally responsive areas at the group and the individual level. Many approaches parcellating the brain in areas with different features became recently available including post-mortem and in vivo architectonics, tractography-based connectivity, functional

coactivation, and resting state functional connectivity. However, what these methods really measure and what conclusion can be drawn, are not yet fully clear to the scientific community. This course addresses this need and is intended for a large audience of research scientist (e.g. from beginner to advanced level).

Course Schedule:

8:00 – 8:40
PART I Parcellate the brain using anatomical features: Histological and microstructural architecture
Paula Croxson, Mount Sinai, New York, NY, United States

8:40 – 9:20
PART I Parcellate the brain using anatomical features: Tractography based subdivision.
Michel Thiebaut de Schotten, Brain Connectivity and Behaviour Group, Paris, France

9:20 – 10:00
PART II Parcellate the brain using functional features: Functional MRI coactivation parcellation
Danilo Bzdok, Research Center Jülich, Jülich, Germany

10:00 – 10:15
BREAK

10:15 – 10:55
PART II Parcellate the brain using functional features: Resting state functional connectivity.
Abraham Snyder, Department of Neurology, Washington University in St. Louis, St. Louis, MO, United States

10:55 – 11:35
PART III Multi-modal Parcellation of the Human Cerebral Cortex.
Matthew Glasser, Washington University in St. Louis, St. Louis, MO, United States

11:35 – 12:00
Questions and Answers

Advanced Methods for Cleaning up fMRI Time-Series

Half Day Morning Course / 8:00 – 12:00
Room: 118-120
Organizers:
Molly Bright, D.Phil, University of Nottingham, Nottingham, United Kingdom

Kevin Murphy, Cardiff University, Cardiff, United Kingdom

As we continue to improve our understanding of brain function, we are designing ever more complicated neuroimaging paradigms to probe network behavior and activation differences between cohorts of individuals, particularly involving resting state data. However, we are simultaneously becoming more aware of how difficult it is to distinguish between the neuronal signal of interest and variance due to confounds such as gross or subtle head motion, respiratory and cardiac variation, arousal levels, and other physiological sources. Papers demonstrating that unmodeled noise confounds can bias results have raised alarm across the entire neuroimaging community. Discussions of the influence of residual noise artifacts on study results are increasingly common in the literature. New methods for characterizing and removing noise signals from fMRI data have exploded in complexity and uptake over the last few years, reflected by a recent special issue of NeuroImage edited by the course organizers and featuring articles by the course presenters. Researchers are now keenly aware that noise can be a huge and tricky problem in their data analysis and interpretation, but still commonly ask: "which noise correction methods should I be using?" This course builds upon the previous pre-processing courses presented at OHBM by tackling advanced noise removal techniques, providing researchers with the practical tools and breadth of understanding to select the best approach for navigating noise in their own fMRI data.

Course Schedule:

8:00 – 8:45
Overview of noise in fMRI
Cesar Caballero Gaudes, Basque Center of Cognition, Brain and Language San Sebastian, Spain

8:45 – 9:30
How to minimize noise at the acquisition stage
Daniel Handwerker, PhD, NIMH, Bethesda, MD, United States

9:30 – 10:00
How-to assess fMRI noise and data quality
Jonathan Power, New York Presbyterian Hospital, New York, NY, United States

10:00 – 10:15
BREAK

10:15 – 10:45
How-to perform nuisance regression
Molly Bright, D.Phil., University of Nottingham, Nottingham, United Kingdom

10:45 – 11:15
How-to use ICA for de-noising
Ludovica Griffanti, FMRIB, Oxford University, Oxford, United Kingdom

11:15 – 11:45
How-to use multi-echo data for de-noising
Prantik Kundu, Mount Sinai, New York, NY, United States

11:45 – 12:00
Questions and Answers

Brain graphs: An Introduction to network analysis of brain imaging data

Half Day Morning Course / 8:00 – 12:00

Room: 109-110

Organizers:

Alex Fornito, Monash University, Clayton, Australia

Andrew Zalesky, University of Melbourne, Melbourne, Australia

Brains are complex, interconnected systems. Recent years have witnessed an unprecedented attempt to understand this complexity, supported by several large-scale efforts to map connectomes in a diverse range of species, at scales ranging from individual neurons and synapses to distributed systems spanning the entire brain. Graph theory, a branch of mathematics concerned with modelling systems of interacting elements, is a powerful framework that can offer a unified way of representing and characterizing these diverse data. The central assumption of graph theory is that any network can be modelled as a collection of nodes connected by edges. In the brain, the nodes can represent neurons, neuronal populations or large-scale brain regions and the edges represent some measure of structural, functional or effective connectivity.

The application of graph theory to neuroscientific data has provided new insights into the organizational properties of brain networks and their generative mechanisms, while also offering a platform for mapping, across the entire connectome, the effects of disease and other experimental manipulations. Graph theory will increasingly become an essential part of the neuroscientists' toolkit, as large, high-quality datasets on brain connectivity provided by initiatives such as the Human Connectome Project continue to be made available. An integrated and comprehensive educational workshop is both timely and necessary to ensure that researchers have access to methods that can maximise the value of these rich data.

This workshop will provide an integrated introduction to the key concepts and methods of the field. Topics covered include methods for constructing valid brain graphs; appropriate methods for characterizing the topological centrality of nodes, putative communication processes, the community structure of brain networks, and multilayer properties; and the use of appropriate statistics and null models.

Course Schedule:

8:00 – 8:35

An introduction to brain graphs

Alex Fornito, Monash Institute of Cognitive and Clinical Neurosciences, Monash University, Clayton, Australia

8:35 – 9:10

Network statistics and thresholding

Andrew Zalesky, Melbourne Neuropsychiatry Centre, The University of Melbourne, Melbourne, Australia

9:10 – 9:45

Paths, diffusion and communication in networks

Bratislav Misic, Montreal Neurological Institute, McGill University, Montreal, Canada

9:45 – 10:20

Modularity in static and dynamic networks

Sarah Muldoon, University at Buffalo, SUNY, Buffalo, NY, United States

10:20 – 10:35

BREAK

10:35 – 11:10

Centrality and hubs

Martijn van den Heuvel, Brain Center Rudolf Magnus, Dutch Connectome Lab, University Medical Center Utrecht, The Netherlands

11:10 – 11:45

Null models and generative models for brain networks

Petra Vértes, University of Cambridge, Cambridge, United Kingdom

Introduction to Imaging Genetics

Half Day Morning Course / 8:00 – 12:00

Room: 217-219

Organizers:

Jason Stein, PhD, University of North Carolina at Chapel Hill, Chapel Hill, NC, United States

This course will introduce the fundamentals of "Imaging Genetics," the process of modeling and understanding how genetic variation influences the structure and function of the human brain as measured through brain imaging. The course begins with a brief history of imaging genetics, including discussion on replicability and significance thresholds. Then, we will discuss endophenotypes including modern methods for assessing heritability and genetic correlation. We will cover datasets and methods for conducting common and rare variant associations, as well as bioinformatic tools to interpret significant findings. We will also cover two nascent and related fields: imaging epigenetics and relating gene expression networks to brain structure and function. Overall this course will provide the neuroimager who is not familiar with genetics techniques an understanding of the current state genetics field when exploring neuroimaging phenotypes.

Course Schedule:

8:00 – 8:30

A brief history of imaging genetics

Jean-Baptiste Poline, PhD, University of California, Berkeley, Berkeley, CA, United States

8:30 – 9:00

The modern day endophenotype

Roberto Toro, PhD, Institut Pasteur, Paris, France

9:00 – 9:30
Utilizing big datasets in imaging-genetics
Derrek Hibar, Institute for Neuroimaging & Informatics, Los Angeles, CA, United States

9:30 – 10:00
Imaging Epigenetics
Sylvane Desrivieres, King's College London, London, United Kingdom

10:00 – 10:15
BREAK

10:15 – 10:45
Networks of gene expression and brain function
Vilas Menon, PhD, HHMI Janelia Research Campus, Ashburn, VA, United States

10:45 – 11:15
Rare variant associations
David Glahn, Yale University, Hartford, United States

11:15 – 11:45
After the association
Jason Stein, PhD, University of North Carolina at Chapel Hill, Chapel Hill, NC, United States

11:45 – 12:00
Questions and Answers

2017 OHBM Open Science Special Interest Group "Brain Hacking 101" Workshop

9:00 –12:00
Rooms: 210 and Workspring Foyer are on level 2
Organizers:
Greg Kiar, McGill Centre for Integrative Neuroscience, McGill University, Quebec, Canada

Pierre Bellec, Centre de recherche Institut Universitaire de gériatrie de Montréal, Department of Computer Science and Operations Research, University of Montreal, Montreal, Quebec, Canada

Cameron Craddock, Nathan Kline Institute and Child Mind Institute, New York, NY, United States

Daniel Margulies, Max Plank Institute for Cognitive and Brain Sciences, Leipzig, Germany

Nolan Nichols, Genentech, San Francisco, CA, United States

Cyril Pernet, The University of Edinburgh, Scotland, United Kingdom

Jean-Baptiste Poline, Helen Wills Neuroscience Institute, University of California, Berkley, CA, United States

Over the past ten years, human brain imaging emerged as a computational field with an increasing demand for open source scientific tools that enable researchers to conduct rich analyses. In this hands-on workshop, the hackathon team, lead by Greg Kiar, will provide a gentle introduction to the tools which are prerequisites for a productive hackathon experience. (1) Social coding platforms (github) enable small or large teams of researchers to collaborate on developing code, and keep track of the history of all changes attached with a project. (2) Software containers (docker) are a simple yet powerful technology to package an entire computational environment, which can be shared and deployed easily. (3) Scientific notebooks (jupyter) are interactive documents that mix text, mathematics, code and the results of an analysis, available for all major scientific computing languages (Python, R, Matlab/Octave). Interested participants should come equipped with a laptop and docker installed **https://www.docker.com/**.

Why it all comes back to Anatomy

Half Day Afternoon Course / 13:00 – 16:30

Room: 217-219

Organizers:

Svenja Caspers, Institute of Neuroscience and Medicine (INM-1), Research Centre Jülich, Jülich, Germany and C. and O. Vogt Institute for Brain Research, University of Düsseldorf, Düsseldorf, Germany

Karl Zilles, Institute of Neuroscience and Medicine (INM-1), Research Centre Juelich, Juelich, Germany and Department of Psychiatry, Psychotherapy, and Psychosomatics, RWTH Aachen University, Aachen, Germany

With modern neuroimaging providing more and more insights into the structure, function and connectivity of the brain on different levels using sophisticated computer algorithms, it remains and becomes even more important that basic anatomical principles and biological properties are the common denominator for integrating these different pieces of evidence. The talks of this course build on each other to provide different neuroanatomical viewpoints. Starting with what can be understood using sophisticated landmarks on the brain's surface, it will be shown where and how microstructural atlases come in handy and how the cortex is microstructurally organized. This links to modern neuroimaging approaches using ultra-high fields studying such features in-vivo as well as to the complex anatomy of the white matter with fiber tracts emanating from the axons which enter and leave the grey matter regions. The resulting tracts provide the structural connections for functional interactions between brain regions, mediated via neurotransmitters and their receptors as the molecular underpinning of resting-state connectivity. Exemplified on the visual system, it will finally be shown how these different levels of anatomical knowledge can be integrated to gain a deeper understanding of structure-function relationships in the brain.

Course Schedule:

13:00 – 13:30

Being the anatomical wiseguy by knowing your landmarks

Julian Caspers, Department of Radiology, University Hospital Düsseldorf, Düsseldorf, Germany

13:30 – 14:00

Where macroscopy fails: going to microscopic architecture

Svenja Caspers, Institute of Neuroscience and Medicine (INM-1), Research Centre Jülich, Jülich, Germany and C. and O. Vogt Institute for Brain Research, University of Düsseldorf, Düsseldorf, Germany

14:00 – 14:30

Finding the micro in the macro using ultra-high resolution MR imaging

Rainer Goebel, Brain Imaging Center, University of Maastricht, Maastricht, Netherlands

14:30 – 14:40

BREAK

14:40 – 15:10

Find your way out of the white matter anatomy jungle

Marco Catani, NATBrainLab, Institute of Psychiatry, Psychology & Neuroscience, King's College, London, United Kingdom

15:10 – 15:40

Anatomy in the resting state? Taking a look at receptor patterns

Karl Zilles, Institute of Neuroscience and Medicine (INM-1), Research Centre Juelich, Juelich, Germany and Department of Psychiatry, Psychotherapy, and Psychosomatics, RWTH Aachen University, Aachen, Germany

15:40 – 16:10

Applied anatomy: links between the scales in the visual system

Kalanit Grill-Spector, PhD, Stanford University, Stanford, CA, United States

16:10 – 16:30

Questions and Answers

Neuroimaging Meta-Analysis

Half Day Afternoon Course / 13:00 – 16:30

Room: 118-120

Organizers:

Thomas Nichols, University of Warwick, Coventry, United Kingdom

Simon Eickhoff, Institute of Neuroscience and Medicine, INM-1, Research Centre Jülich, Jülich, Germany

Functional neuroimaging has provided a wealth of information on the cerebral localization of mental functions. In spite of its success, however, several limitations restrict the knowledge that may be gained from each individual experiment. These include a usually rather small sample size, limited reliability of an indirect signal like BOLD fMRI and the need to base inference on relative contrasts between conditions. Such limitations have raised some concerns on the interpretability and validity neuroimaging results, but have also encouraged the development of quantitative meta-analysis approaches. Neuroimaging meta-analysis is used to summarize a vast amount of research findings across a large number of participants and diverse experimental settings. Such integration then enables statistically valid generalizations on the neural basis of psychological processes in health and disease. They also permit comparisons of different tasks or processes to each other and the modeling of interacting networks. Quantitative meta analysis therefore represents a powerful tool to gain a synoptic view of distributed neuroimaging findings in an objective and impartial fashion, addressing some of the limitations raised above. The purpose of this course is to review the theory and practice of meta-analytic modeling and database-driven syntheses. In order to provide a comprehensive overview, this course spans both basic and advanced topics and addresses practical tips and tools to conduct meta-analytic studies in psychological and clinical applications. This broad coverage will thus provide both a deeper understanding of the methodological

underpinnings as well as concrete ideas for how to apply meta analytic techniques to advance brain science.

Course Schedule:

13:00 – 13:20
Foundations and potential of meta-analyses
Peter Fox, University of Texas Health Science Center at San Antonio, San Antonio, TX, United States

13:20 – 13:40
How to Plan and Prepare a Meta-Analysis
Felix Hoffstaedter, Research Centre Jülich, INM-1, Jülich, Germany

13:40 – 14:00
Overview on Meta-Analysis methods
Thomas Nichols, University of Warwick, Coventry, United Kingdom

14:00 – 14:20
ALE and BrainMap
Angie Laird, Florida International University, Miami, FL, United States

14:20 – 14:40
MKDA and Neurosynth
Tal Yarkoni, University of Texas at Austin, Austin, TX, United States

14:40 – 15:10
BREAK

15:10 – 15:30
Practical Intensity Based Meta-Analysis
Camille Maumet, University of Warwick, Coventry, United Kingdom

15:30 – 15:50
Co-activation mapping and parcellation
Sarah Genon, Jülich Research Centre, Jülich, Germany

15:50 – 16:10
Inferring mental states from imaging data: OpenfMRI and the Cognitive Atlas
Russell Poldrack, Stanford University, Stanford, CA, United States

16:10 – 16:30
Questions and Answers

Practicalities for reproducible neuro-imaging 2.0

Half Day Afternoon Course / 13:00 – 16:30
Room: 202-204
Organizers:
Dr. Cyril Pernet, The University of Edinburgh, Edinburgh, United Kingdom

Pierre Bellec, CRIUGM/DIRO University of Montreal, Outremont, Québec

Lately, the scientific world has been inundated with failures to replicate and neuroimaging is likely to be affected by the same problems. This crush of false positive results is worrying: increasingly evidence suggests that false positives are proliferating due to unchecked researcher biases, which favour analysing data until a publishable positive result is obtained. No researcher wants to make spurious discoveries, but researchers do not know how to change their practices to prevent them. The goal of this course is to present practical solutions that have been developed, allowing any researchers (not just programmers) to conduct power analyses, analyse data and publish results in a reproducible manner.

Course Schedule:

13:00 – 13:30
The reproducibility crisis
Cyril Pernet, Dr., The University of Edinburgh, Edinburgh, United Kingdom

13:30 – 14:00
Statistical power in neuroimaging
Jeanette Mumford, University of Wisconsin – Madison, Madison, WI, United States

14:00 – 14:30
The ins and outs of study pre-registration
Pia Rotshtein, Dr., University of Birmingham, Birmingham, United Kingdom

14:30 – 14:50
BREAK

14:50 – 15:20
Making analyses reproducible with limited programming skills
Pierre Bellec, CRIUGM/DIRO University of Montreal, Outremont, Québec, Canada

15:20 – 15:50
How to organize and share data: the Brain Imaging Data Structure
Michael Hanke, Dr., University of Magdeburg, Magdeburg, Germany

15:50 – 16:20
Modern tools for sharing and synthesizing neuroimaging results
Krzysztof Gorgolewski, Dr., Stanford University, Stanford, CA, United States

16:20 – 16:30
Questions and Answers

Taking Connectivity to a Skeptical Future: Challenges, Tools and Techniques

Half Day Afternoon Course / 13:00 – 16:30

Room: 109-110

Organizers:

Victor Solo, UNSW, Sydney, Australia & MGH-Martinos Center for Biomedical Imaging, Harvard Medical School, Boston, MA, United States

Mark Woolrich, OHBA, University of Oxford, Oxford, United Kingdom

The neuroimaging network paradigm has gained a lot of traction in recent years as a framework for understanding cognition. However the existing tools such as correlation matrices, graph analysis methods and time-varying connectivity have bumped into their limits. Consequently the network paradigm is a very long way from achieving its potential. In particular, currently, there are no mature answers to basic questions of: biomarker development; reliable individual network construction (crucial for the development of imaging based personalised medicine); construction and validity of time-varying networks and relating information across modalities.

Thus now is a perfect moment time to present to junior scholars, a selection of major emerging techniques that go beyond the current limits. In each case a domain expert will explain the basics of the new methods, illustrate with preliminary results and outline challenges for the future.

Course Schedule:

13:00 – 13:25

Reliable Individual Functional Networks and their Relationship to Behavior

Emily Finn, Yale University, New Haven, CT, United States

13:25 – 13:50

Estimating Functional Connectomes: Sparsity's Strength and Limitations

Gael Varoquaux, INRIA, Palaiseau, France

13:50 – 14:15

Time-varying Connectivity

Steven Petersen, PhD, Washington University, St. Louis, WA, United States

14:15 – 14:40

Multimodal Static and Dynamic Connectomes

Mark Woolrich, OHBA, University of Oxford, Oxford, United Kingdom

14:40 – 15:00

BREAK

15:00 – 15:25

Community Structure in Networks: Static, Dynamic, and Multimodal Approaches

Danielle Bassett, Department of Bioengineering, University of Pennsylvania, Philadelphia, PA, United States

15:25 – 15:50

Multivariate Modeling and Inference for Brain Networks: ERGMs and Mixed Models

Sean Simpson, PhD, Wake Forest School of Medicine, Winston-Salem, NC, United States

15:50 – 16:15

The Future Shape of Neuroimaging with Persistent Homology

Ben Cassidy, PhD, Columbia University, New York, NY, United States

16:20 – 16:30

Questions and Answers

Opening Ceremonies

17:30 – 19:30

Room: Ballroom AB

The Opening Ceremonies is the official kick-off where attendees can gather together to celebrate the start of the 23rd Annual Meeting! Here we will honor the accomplishments of our colleagues receiving special recognition during the Awards Program for OHBM's Glass Brain Award recognizing a lifetime of achievement; OHBM Young Investigator Award, the Education in Neuroimaging Award and the NEW Replication Award.

Talairach Lecture

Synapses lost and found: developmental critical periods and Alzheimer's Disease

Carla J. Shatz, PhD, Professor of Biology and Neurobiology, Director, Stanford Bio-X, Stanford University, Stanford, CA, United States

Neural activity is needed to fine tune brain circuits. MHC Class I molecules and PirB receptor, thought previously to function only in immunity, act at neuronal synapses to regulate synapse pruning and plasticity. Changes in expression could contribute to Autism and Schizophrenia, and to the synapse and memory loss in Alzheimer's disease.

19:30 – 21:00

Welcome Reception

Ballroom C, D and West Pacific Terrace

Join us for the 2017 Annual Meeting Welcome Reception. The reception will be held at the Vancouver Center immediately following the Opening Ceremonies and Talairach Lecture on Sunday, June 25th. **Please make sure to wear your name badge, which will serve as your ticket to the event.** Additional guest badges are $50.00 USD.

MORNING SYMPOSIA

8:00 – 9:15

Method Validation in functional MRI using Realistic Simulations

Room: Ballroom C

Organizer:

Pierre Bellec, CRIUGM/DIRO University of Montreal, Outremont, Québec

Advanced analytical tools play a central role in human brain mapping research. The validation of these tools, however, is particularly challenging in the absence of a ground truth. Sound method papers generally include some benchmark evaluations on simulated data, where the ground truth is known and different scenarios can be tested. If these simulations are based on simplistic assumptions, as is most often the case, such experiment holds more as a sanity check than an actual demonstration of validity.

Recently, fMRI simulations with realistic properties have started to emerge in the context of method validation. The results have sometimes been very surprising, challenging common practice in fMRI data analysis, such as the inflated family-wise error in cluster-based inference implemented in many popular packages (FSL, SPM, AFNI).

In this symposium, we will present a number of validation works, covering established methods (false-discovery rate and cluster-based inference in group general linear models) as well as emerging techniques (artifact reduction using independent component analysis). The simulation models themselves will cover a range of techniques (resampling of real data, linear mixture of real spatial component, multimodal computational model of brain connectivity). Importantly, each speaker will present works based on public software packages that can be used to implement these solutions.

SYMPOSIUM SCHEDULE:

8:00 – 8:15

Cluster Failure: Why fMRI Inferences for Spatial Extent Have Inflated False-Positive Rates

Anders Eklund, PhD, Linköping University, Linköping, Sweden

8:15 – 8:30

Approaches to developing appropriate simulations and null models for dynamic connectivity in fMRI data

Vince Calhoun, The Mind Research Network & LBERI; Department of Electrical and Computer, Engineering, UNM, Albuquerque, NM, United States

8:30 – 8:45

fMRI bootstrap simulations for the validation of statistics on connectomes

Pierre Bellec, CRIUGM/DIRO University of Montreal, Outremont, Québec

8:45 – 9:00

Multimodal simulations based on realistic structural connectivity using the Virtual Brain Platform

Petra Ritterm, Charité University Medicine Berlin, Berlin, Germany

9:00 – 9:15

Questions and Answers

Large-scale spatial trends in cortical organization

Room: Ballroom AB

Organizer:

Daniel Margulies, Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany

Mapping the cerebral cortex has predominantly focused on the delineation of discrete areas and networks. However, this assumption of discrete modularity has long been debated. With the recent landmark advances in cortical parcellation, our symposium on large-scale trends aims to introduce the OHBM community to this alternative view of brain organization.

We explore this topic through four areas of research: cortical microstructure, individual-level network organization, spatial distribution of cognitive function, and multimodal organization of the frontal lobes. This symposium is organized around four experts in the field developing complementary approaches. The four lectures will show that (1) common trends in intracortical myelin and connectivity as assessed with submillimeter resolution 7T MRI data, (2) fractionation of individual-level networks occur along consistent group-level gradients, (3) the default-mode network is located along a continuous structural and functional axis from other large-scale systems, and (4) clear anatomical signatures support the cognitive model of antero-posterior organization of the frontal lobes. Together these results demonstrate that the brain is organized in large-scale structural/functional gradients.

SYMPOSIUM SCHEDULE:

8:00 – 8:15

Multimodal trends in frontal lobe organization

Michel Thiebaut de Schotten, Brain Connectivity and Behaviour Group, Paris, France

8:15 – 8:30

A topological perspective on the functions of the default mode network

Jonathan Smallwood, The University of York, York, United Kingdom

8:30 – 8:45

A systematic relationship between cortical microstructure and connectivity gradients

Julia Huntenburg, Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany

8:45 – 9:00
Characterization of distributed network architectures within the individual
Rodrigo Braga, Harvard University, Cambridge, MA, United States

9:00 – 9:15
Questions and Answers

Uncovering complexity with long-term naturalistic recordings

Room: 220-222
Organizers:
Bingni Brunton, PhD, University of Washington, Seattle, WA, United States

Rajesh Rao, PhD, University of Washington, Seattle, WA, United States

This symposium topic is one of the first of its kind. Although long-term clinical recordings have existed for many years, it is only very recently that analytic tools and computational resources have matured to enable meaningful analysis of these datasets. Researchers are now asking a variety of questions critically enabled by these long-term recordings, including analysis of naturalistic movement and speech. The number of labs focusing on long-term naturalistic recordings is growing, and we hope the symposium will foster collaboration and catalyze exchange of knowledge between researchers.

SYMPOSIUM SCHEDULE:

8:00 – 8:15
Accelerating long-term, naturalistic ECoG understanding using automated video and audio annotations
Xin Ru (Nancy) Wang, BS, MS, University of Washington, Seattle, WA, United States

8:15 – 8:30
Context specific ECoG correlates of naturalistic motor behavior
Vikash Gilja, PhD, University of California, San Diego, La Jolla, CA, United States

8:30 – 8:45
Modeling continuous ECoG responses to naturalistic speech using recurrent neural networks
Julia Berezutskaya, BS, University Medical Center Utrecht, Utrecht, Netherlands

8:45 – 9:00
Out-of-the-lab neuroscience: Intracranial EEG as a window of brain function during non-experimental, real-life conditions
Tonio Ball, MD, BrainLinks-BrainTools, University of Freiburg, Freiburg, Germany

9:00 – 9:15
Questions and Answers

How visual experience affects (or not) the functional organization of the "visual" cortex

Room: 211-214
Organizers:
Olivier Collignon, University of Louvain/University of Trento, louvain-la-neuve, Belgium/Trento, Italy

How does sensory experience shapes the development of the brain? Since the dawn of neuroscience, the study of the consequences of sensory deprivation has served as one of the most compelling model system to address such fundamental question. Recent researches involving early blind individuals have shed new lights on the old 'nature versus nurture' debate regarding brain development: whereas the recruitment of the deprived regions by ectopic inputs highlights how experience shapes brain development (nurture's influence), the observation of specialized functional units in these deprived regions, sometimes similar to those observed in hearing and seeing people, highlights the intrinsic constraints imposed to such crossmodal plasticity (nature's influence). However, many debates animate this blossoming field of research. Are the specific functional activations observed in the occipital cortex of the blind reflecting the amodal nature these regions? Alternatively, is a developing brain region versatile enough to switch its preferential sensory tuning or even switch its functional tuning in case of early visual deprivation?

SYMPOSIUM SCHEDULE:

8:00 – 8:15
Higher-cognitive functions in the visual cortices of congenitally blind individuals: evidence for a pluripotent cortex
Marina Bedny, PhD, Johns Hopkins University, Baltimore, MD, United States

8:15 – 8:30
How blindness improved our vision on brain function: towards a supramodal morphofunctional organization of the brain
Emiliano Ricciardi, MoMiLab, IMT School for Advanced Studies, Lucca, Italy

8:30 – 8:45
How input modality and visual experience affect the functional response of the "visual" cortex
Olivier Collignon, University of Louvain/University of Trento, louvain-la-neuve, Belgium/Trento, Italy

8:45 – 9:00
An updated view on the origins of cortical selectivity in the Human Brain
Amir Amedi, The Hebrew University, Jerusalem, Israel

9:00 – 9:15
Questions and Answers

BREAK
9:15 – 9:30

KEYNOTE LECTURE
9:30 – 10:15

Room: Ballroom AB

Brain Growth and the Development of Face Recognition

Kalanit Grill-Spector, PhD, Stanford University, CA, United States

How do brain mechanisms develop from childhood to adulthood? There is extensive debate if brain development is due to pruning of excess neurons, synapses, and connections, leading to reduction of responses to irrelevant stimuli, or if development is associated with growth of dendritic arbors, synapses, and myelination leading to increased responses and selectivity to relevant stimuli. Our research addresses this central debate using cutting edge multimodal imaging, obtaining multiple measurements of brain function using functional magnetic resonance imaging (fMRI), and brain anatomy using quantitative MRI (qMRI) and diffusion MRI (dMRI) in each of 27 children (ages 5-12) and 30 adults (ages 22-28). We use the face recognition system as a model system to study brain development as it is a well understood cortical system that shows particularly protracted development throughout childhood and adolescence, into adulthood.

Both functional and anatomical measurements provide compelling empirical evidence supporting the growth hypothesis. Functionally, results reveal (1) age-related increases in the size of face-selective regions, (2) age-related increases in responsiveness and selectivity to faces, and (3) a developmental increase in neural sensitivity to face identity, which is correlated with an increase in perceptual discriminability of faces. Importantly, this development is specific, occurring in face- but not object- and place-selective regions and cannot be explained by differences in data quality or measurement noise across age groups. Anatomically, we find (1) age-related decreases in T1 relaxation that are associated with increases in macromolecular tissue volume in face- but not place-selective regions, which we validate in histological slices of postmortem brains, (2) this tissue development is correlated with specific increases in functional selectivity to faces, as well as improvements in face recognition, and (3) the largest developmental decreases in both T1 relaxation and mean diffusivity occur close to the gray-white matter boundary of face-selective regions, suggesting that in addition to dendritic complexification increased myelination may contribute to tissue growth. Together, these data suggest a new model by which emergent brain function and behavior during childhood result from cortical tissue growth rather than from pruning.

BREAK
10:15 – 10:25

BEST PAPER AWARD PRESENTATIONS
10:25 – 10:50

Room: Ballroom AB

The following awards will be announced:
The *Springer* Brain Topography's Editor's Choice Award
The *Wiley* Human Brain Mapping's Editor's Choice Awards
The *Elsevier* NeuroImage Best Paper Award

LOC SYMPOSIA:

Myelin Water Imaging in Human Brain: Principles, Validation and Applications

10:50 – 12:00

Room: Ballroom AB

Organizers:
OHBM 2017 Local Organizing Committee

White matter makes up 40% of brain tissue. Myelin is a critical structural and functional component of white matter that allows rapid and effective information exchange in the brain. Recent animal work shows that myelin is neuroplastic. Using a rodent model, McKenzie et al. (2014) established the relationship between oligodendrocyte proliferation and learning, showing accelerated oligodendrocyte generation is associated with performance of a complex skill and an absence of motor learning when these cells were genetically blocked. However, much less is known about what changes in myelin are associated with learning or following brain damage in humans. Recently non-invasive imaging techniques have emerged that can characterize myelin in vivo in humans. This symposium will provide suggestions for the implementation of myelin water imaging to index myelin in humans in future work.

SYMPOSIUM SCHEDULE:

10:50 – 11:07

Overview of myelin water imaging
Alex MacKay, PhD, University of British Columbia, Vancouver, Canada

11:07 – 11:25

Histopathological validation of MWF as an index of myelin
Corree Laule, PhD, University of British Columbia, Vancouver, Canada

11:25 – 11:42

Evidence of Continued Myelination into the Middle Age of Healthy Adults from Myelin Water Imaging
Jeffrey A. Stanley, PhD, Wayne State University, Detroit, MI, United States

11:42 – 12:00

Myelin water imaging to index behaviour in healthy and clinical populations
Lara Boyd, PT, PhD, University of British Columbia, Vancouver, Canada

LUNCH ON OWN
12:00 – 12:45

Publishing Roundtable: Exploring the Landscape of Publishing

12:00 – 14:30

Room: 211-214

During this roundtable, attendees will be provided with an overview of the current landscape and trends within the publishing community followed by a facilitated discussion with key journal editors. Attendees will have the opportunity to ask questions and engage in open dialogue with the panel to gain knowledge that will assist with publishing their own work.

POSTER SESSION

12:45 – 14:45

Exhibit Hall, Lower Level

Poster Numbers #1000-2222

Authors with EVEN numbered posters will present their posters today.

Brain Stimulation Methods: Deep Brain Stimulation, Direct Electrical/Optogenetic Stimulation, Invasive Stimulation Methods Other, Non-invasive Electrical/tDCS/tACS/tRNS, Non-invasive Magnetic/TMS, Non-Invasive Stimulation Methods Other, Sonic/Ultrasound, TDCS, TMS

Disorders of the Nervous System: Addictions, Anxiety Disorders, Autism, Bipolar Disorder, Depressive Disorders, Medical illness with CNS impact (e.g. chemotherapy, diabetes, hypertension), Obsessive-Compulsive Disorder and Tourette Syndrome, Research Domain Criteria studies (RDoC), Schizophrenia and Psychotic Disorders, Sleep Disorders

Emotion and Motivation: Emotion and Motivation Other, Emotional Learning, Emotional Perception, Reward and Punishment, Sexual Behavior

Imaging Methods: BOLD fMRI, Diffusion MRI, Multi-Modal Imaging Informatics: Brain Atlases, Databasing and Data Sharing, Informatics Other, Workflows

Modeling and Analysis Methods: Bayesian Modeling, Diffusion MRI Modeling and Analysis, EEG/MEG Modeling and Analysis, Exploratory Modeling and Artifact Removal, Motion Correction and Preprocessing, Multivariate modeling, Other Methods, PET Modeling and Analysis, Segmentation and Parcellation, Task-Independent and Resting-State Analysis, Univariate Modeling

Motor Behavior: Brain Machine Interface, Mirror System, Motor Behavior Other, Motor Planning and Execution, Visuo-Motor Functions

Neuroanatomy: Anatomy and Functional Systems, Cortical Anatomy and Brain Mapping, Cortical Cyto- and Myeloarchitecture, Microcircuitry and Modules, Neuroanatomy Other, Normal Development, Subcortical Structures, White Matter Anatomy, Fiber Pathways and Connectivity, Subcortical Structures

Perception and Attention: Attention: Auditory/Tactile/Motor, Attention: Visual, Chemical Senses: Olfaction, Taste, Consciousness and Awareness, Perception and Attention Other, Perception: Auditory/Vestibular, Perception: Multisensory and Crossmodal, Perception: Pain and Visceral, Perception: Tactile/Somatosensory, Perception: Visual, Sleep and Wakefulness

Physiology, Metabolism and Neurotransmission: Cerebral Metabolism and Hemodynamics, Neurophysiology of Imaging Signals, Pharmacology and Neurotransmission and Physiology, Metabolism and Neurotransmission Other

AFTERNOON SYMPOSIA

14:45 – 16:00

Predicting the future: Multivariate models of brain-ageing in health and disease

Room: Ballroom C

Organizers:

James Cole, PhD, Imperial College London, London, United Kingdom

Katja Franke, University Hospital Jena, Jena, Germany

Nicolas Cherbuin, PhD, Australian National University, Canberra, Australia

The ageing human population is experiencing a growing burden of brain diseases, due to the fact that the ageing brain becomes increasingly vulnerable to neurodegeneration and associated conditions. Treatment trials for neurodegenerative conditions have yielded few positive results, in part because the damage may be irreversible by the time symptoms manifest. Hence, methods are needed to make early predictions of people's future risk of advanced brain ageing and disease manifestation, to enable prevention through more targeted treatments. A key development in efforts to improve predictions of brain ageing is the adoption of multivariate analysis methods, enabling the incorporation of high-dimensional data and more personalised predictions, which is the focus of this symposium. Highlighting this topic is timely as the complex statistical methods for modelling and predicting brain ageing are now becoming more widespread and sophisticated. These technical developments are coinciding with an upsurge in data sharing, and the pooling of datasets necessary for modelling personalised longitudinal trajectories of brain ageing is increasingly commonplace. This symposium will provide a critical overview of methodological trends for modelling individual brain ageing, focusing on machine learning and multi-voxel pattern analysis. Further, it will showcase the most recent data that uses neuroimaging to predict future ageing and related health outcomes, including cognitive decline, the manifestation of neurodegenerative disease and mortality.

SYMPOSIUM SCHEDULE:

14:45 – 15:00

An overview of neuroimaging markers of brain ageing

Katja Franke, PhD, University Hospital Jena, Jena, Germany

15:00 – 15:15

Predicting brain-age from multimodal imaging data captures cognitive impairment

Franziskus Liem, PhD, University of Zurich, Zurich, Switzerland

15:15 – 15:30

Predicting measures of healthy ageing and mortality using neuroimaging

James Cole, PhD, Imperial College London, London, United Kingdom

15:30 – 15:45

Machine learning methods provide structural and functional brain aging signatures that predict subsequent clinical progression

Christos Davatzikos, PhD, University of Pennsylvania, Philidelphia, PA, United States

15:45 – 16:00

Questions and Answers

Multimodal Functional Cartography: from connectivity to cognition

Room: Ballroom AB

Organizers:

B.T. Thomas Yeo, National University of Singapore, Singapore, Singapore

Bertrand Thirion, Inria, Saclay, France

In recent years, the neuroimaging community has spent major efforts to propose new representations of brain organization that better account for functional characteristics observed in imaging, such as response magnitude to tasks, functional connectivity or variations of functional tuning along the cortical surface. The use of resting-state fMRI at a large scale, e.g., in the human Connectome project, has been key in that respect. While some consensus has been progressively reached on the units constituting the macroscopic features of brain organization, the question of functional specialization has been handled mostly separately through the framework of coordinate-based meta-analysis. The current situation is that i) the atlasing view focuses mostly on connectivity-based parcellation, i.e. the definition of edges and stable structure according to the large-scale connectivity differences, while ii) the cognitive view considers functional mapping in a coordinate system, without any explicit reference to intermediate structures or boundaries.

The objective of this workshop is to try and reconcile the two views on brain organization: namely that of a set of regions characterized by connectivity on the one hand, and regions that are also functionally specialized. To this end, we will start with current developments on coordinate-based meta-analyses that emphasize a network-oriented view. We will reciprocally consider the impact of functional tasks on brain connectivity measures to assess how extrinsic conditions and intrinsic organization combine to result in inter-subject variability. We will then question our current descriptions of cognitive ontologies, given that the underlying taxonomy used has a central impact on the way brain functional specialization is described and understood. Finally, we will discuss two frontiers of cognitive mapping: that of the statistical assessment of functional specificity and that of individualized cognitive analysis, which opens the way toward high-resolution cognitive mapping.

SYMPOSIUM SCHEDULE:

14:45 – 15:00

Coordinate-Based Meta-analysis: From Consensus to Discovery Science

B.T. Thomas Yeo, National University of Singapore, Singapore, Singapore

15:00 – 15:15

Factors influencing how tasks modify brain networks

Caterina Gratton, Washington University in St Louis, St. Louis, MO United States

15:15 – 15:30

Testing cognitive ontologies using large-scale behavioral and neuroimaging data

Russell Poldrack, Stanford University, Stanford, CA, United States

15:30 – 15:45

In search for functional specificity through large-scale encoding and decoding models

Bertrand Thirion, Inria, Saclay, France

15:45 – 16:00

Questions and Answers

Inferring brain-computational mechanisms by testing representational models

Room: 211-214

Organizer:

Jorn Diedrichsen, Western University, London, Canada

In the past few years, a number of laboratories have started to go beyond activation mapping and pattern decoding, using functional brain imaging (1) to characterize how information is represented in different brain regions and (2) to adjudicate between alternative brain-computational models. These advances are built on condition-rich experiments and novel data analysis techniques. Encoding models, representational similarity analysis (RSA), and Bayesian approaches such as pattern component modelling (PCM) provide powerful and flexible tools for inferring which of several alternative models best explains a brain representation. While these approaches have been developed relatively independently of each other, they share core conceptual commonalities. This Educational Course will teach (1) how to construct models of brain representations, (2) how to design condition-rich experiments to test them, and (3) how to adjudicate between competing models using encoding analysis, RSA, and PCM. We will teach the mathematical relationship of these approaches, which are closely related by the fact that they all test hypotheses about the second moment of the activity profiles. We will discuss the complementary strengths and weaknesses of the approaches and how they can be combined as part of a larger toolbox for testing representational models.

SYMPOSIUM SCHEDULE:

14:45 – 15:05

Using voxel-wise encoding models to study cortical representations

Alexander Huth, UC Berkeley, Berkeley, CA, United States

15:05 – 15:25

Representational similarity analysis

Niko Kriegeskorte, Cambridge, Cambridge, United Kingdom

15:25 – 15:45

Pattern component modelling – A practical Bayesian approach to representational model comparison

Jorn Diedrichsen, Western University, London, Canada

15:45 – 16:00

Questions and Answers

BREAK

16:00 – 16:15

KEYNOTE LECTURE

16:15 – 17:00

Room: Ballroom AB

Threats to valid inference with fMRI: a primer

Tal Yarkoni, University of Texas at Austin, TX, United States

Functional MRI is a powerful tool, but like most powerful tools, it works best when operated with care and consideration. In this talk, I selectively review a number of methodological and statistical issues that are routinely overlooked in neuroimaging studies, yet threaten the validity of many common inferences. These include concerns about measurement error, construct validity, statistical confounding, causal attribution, and generalizability of results. Drawing on both contemporary examples from neuroimaging and decades of domain-general psychometric research, I demonstrate how researchers who ignore such concerns run a substantial risk of getting major conclusions wrong--or, worse, not even wrong. For principled reasons, I do not, however, discuss any solutions to these problems.

BREAK

17:00 – 17:15

ORAL SESSIONS

17:15 – 18:30

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. Authors listed are the presenting authors, a full list of authors can be found in the Abstract / Poster Listing Booklet (**www.humanbrainmapping.org/2017Posters**), in the E-poster search (**http://ww5.aievolution.com/hbm1701/**) or in the mobile app.

Acquisition Methods

Room: Ballroom AB

Chairs:

Karla Miller, PhD, FMRIB Centre, University of Oxford, United Kingdom

Jean Chen, PhD, Scientist, Rotman Research Institute, Baycrest Centre for Geriatric Care, Assistant Professor, Medical Biophysics, University of Toronto, Canada Research Chair in Neuroimaging of Aging, Toronto Canada

17:15 – 17:27

1613: Toward real-time head motion correction for EEG-fMRI: EEG-derived motion components classification

Chung Ki Wong, Laureate Institute for Brain Research, Tulsa, OK, United States

17:27 – 17:39
1567: High resolution diffusion MRI and tractography of post mortem human brains using kT-dSTEAM at 9.4T
Francisco J. Fritz, Maastricht University, Maastricht, The Netherlands

17:39 – 17:51
1581: Distortion corrected EPI with joint interleaved blip up/down reconstruction
Benjamin Zahneisen, Stanford University, Stanford, CA, United States

17:51 – 18:03
1481: Comparable Dynamic Resting-state Functional Connectivity of FMRI and LFPs via Hidden Markov Models
Zhaoyue Shi, Vanderbilt University Institute of Imaging Science, Nashville, TN, United States

18:03 – 18:15
1483: The effect of k-space sampling and signal decay on the effective spatial resolution in fMRI
Denis Chaimow, University of Tübingen, Tübingen, Germany / Center for Magnetic Resonance Research, University of Minnesota, Minneapolis, MN, United States

18:15 – 18:30
1551: Multiband and Multiband Multiecho: rsfMRI comparison study
Zahra Fazal, Donders Center for Cognitive and Neuroimaging, Nijmegen, The Netherlands

Informatics

Room: 211-214
Chairs:
Sook-Lei Liew, PhD, OTR/L, Keck School of Medicine Department of Neurology, USC Stevens Neuroimaging and Informatics Institute, University of Southern California, Los Angeles, CA, United States

Camille Maumet, PhD, University of Warwick, Covdentry, United Kingdom

17:15 – 17:27
1672: Open Neuroimaging Lab. An opensource Web framework for collaboration around brain imaging data.
Katja Heuer, Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany

17:27 – 17:39
1674: A quantitative evaluation of Neurosynth's annotation methods
Taylor Salo, B.A., Florida International University, Miami, FL, United States

17:39 – 17:51
1677: OpenNeuro – a free online platform for sharing and analysis of neuroimaging data
Krzysztof Gorgolewski, Dr., Stanford University, Stanford, CA, United States

17:51 – 18:03
1654: Navigating the "little brain": Comprehensive mapping of cognitive function in the human cerebellum
Jorn Diedrichsen, Western University, London, Canada

18:03 – 18:15
4081: Performance of Various Brain Atlases for Individual Identification using resting fMRI
Andrew Michael, Autism and Developmental Medicine Institute, Geisinger Health System, Lewisburg, PA, United States

18:15 – 18:30
1660: Brainnetome Atlas: A New Map of Human Brain
Lingzhong Fan, Brainnetome Center,Institute of Automation, Chinese Academy of Sciences, Beijing, China

Perception & Attention

Room: Ballroom C

Chair:

Kalanit Grill-Spector, PhD, Stanford University, Stanford, CA, United States

17:15 – 17:27

1723: Sharing deep generative representation for perceived image reconstruction from human brain activity

Changde Du, Research Center for Brain-Inspired Intelligence, Institute of Automation, CAS, Beijing, China

17:27 – 17:39

2172: Deep Recurrent Neural Network Reveals A Hierarchy of Temporal Receptive Window in the Visual Cortex

Junxing Shi, Purdue University, West Lafayette, IN, United States

17:39 – 17:51

2074: L-dopa modulates brain networks and signal variability in the listening brain

Mohsen Alavash, University of Lübeck, Lübeck, Germany

17:51 – 18:03

2223: Linking cortical architecture and perception: a mechanistic role for GABA?

James Kolasinski, Cardiff University, Cardiff, United Kingdom

18:03 – 18:15

2187: Differential contributions of transient and sustained channels across the visual hierarchy

Anthony Stigliani, Stanford University, Stanford, CA, United States

18:15 – 18:30

2201: Data-driven estimates of vigilance are linked with fluctuations in task performance

Catie Chang, NIH, Bethesda, MD, United States

Psychiatric Disorders

Room: 220-222

Chair:

Katherine Karlsgodt, PhD, Department of Psychology Maumet, Department of Psychiatry and Biobehavioral Sciences, University of California, Los Angeles, CA, United States

17:15 – 17:27

1215: MicroRNA132 Associated Multimodal Neuroimaging Patterns Impaired in Unmedicated Major Depression

Shile Qi, Brainnetome Center and NLPR, Institute of Automation,Chinese Academy of Sciences / University of Chinese Academy of Sciences, Beijing, China | Beijing, China

17:27 – 17:39

3262: Mapping neuroplasticity associated with reduced depressive symptoms after cognitive training for TBI

Kihwan Han, PhD, Center for BrainHealth(R), University of Texas, Dallas, TX, United States

17:39 – 17:51

1320: Network Dysconnectivity Associated With Psychopathology Across Clinical Diagnostic Categories

Cedric Huchuan Xia, Neuropsychiatry Section, Department of Psychiatry, University of Pennsylvania, Philadelphia, PA, United States

17:51 – 18:03

1330: Polygenic Risk Score for Schizophrenia of CACNA1C Associated with Parahippocampal Hyperconnectivity

Jiayu Chen, The Mind Research Network & LBERI, Albuquerque, NM, United States

18:03 – 18:15

1172: Multidimensional MRI subtyping of autism spectrum disorders

Seok-Jun Hong, Multimodal Imaging and Connectome Analysis Lab, Montreal Neurological Institute, McGill University, Quebec, Canada

18:15 – 18:30

3320: Diffusion Tensor Imaging in 22q11.2 Deletion Syndrome: ENIGMA working group meta-analysis findings

Julio Villalon, Imaging Genetics Center, USC, Marina del Rey, CA, United States

MORNING SYMPOSIA

8:00 – 9:15

Collect Your Thoughts: Individual Differences in the Networks Underlying Intelligence

Room: Ballroom C

Organizer:

Rhodri Cusack, Trinity College Dublin, Ireland

Intelligence is among the most central of human abilities, predicting a wide range of outcomes across the lifespan. How information is brought together to allow complex, flexible cognition is fundamental to human intelligence. This symposium will focus on the relationship between individual differences in complex cognition and individual differences in network connectivity. It will champion the beauty of novel analysis methods, the brains of neuroimaging, and the brawn of large-scale data analysis. We show that in the first months after birth, fronto-parietal networks are maturely connected and that individual differences in connectivity influence early development. Complimenting these infant data, using structural equation modelling and Bayesian model comparison, we will present a study of adults across the lifespan (18-88 years old) that shows that higher intelligence is mediated by increased processing speed, resulting from stronger structural connectivity, most notably in the frontal lobe's Forceps Minor tract. Using clustering of networks between brain regions and across time, we then show that these brain networks dynamically reconfigure during complex cognition and that individual differences in this reconfiguration modulate performance. Finally, convergent data from three domains in adults—loss of consciousness during anaesthesia, loss of consciousness after severe brain injury, and cognitive performance in healthy individuals—show that the diversity of the functional responses in sensory and fronto-parietal regions to naturalistic stimulation underlies conscious cognition and individual differences in intellectual abilities. Reflecting the growing demand for greater reproducibility in cognitive neuroscience, we report findings from N=1900 participants, to provide a rich window onto the role of neural integration and differentiation in complex cognition.

SYMPOSIUM SCHEDULE:

8:00 – 8:15

The Fronto-Parietal Network is Maturely Connected and Influences Developing Behaviour from the First Months

Rhodri Cusack, Trinity College Dublin, Ireland

8:15 – 8:30

Watershed Models of Intelligence Through the Lifespan

Rogier Kievit, University of Cambridge, Cambridge, United Kingdom

8:30 – 8:45

Charting Dynamic Interactions Between Large-Scale Brain Networks in Health and Disease

Danielle Bassett, Department of Bioengineering, University of Pennsylvania, Philadelphia, PA, United States

8:45 – 9:00

The Neural Machinery of Conscious Cognition: Converging Evidence from Anesthesia-Induced Unconsciousness, Severe Brain Injury and Intellectual Prowess

Lorina Naci, University of Western Ontario, London, ON, Canada

9:00 – 9:15

Questions and Answers

High resolution fMRI via multiband (SMS) acquisition: opportunities and limitations

Room: Ballroom AB

Organizer:

Jo Etzel, PhD, Washington University in St. Louis, Saint Louis, MO, United States

Simultaneous multi-slice (SMS, also called multiband, MB) EPI imaging is becoming widespread in functional neuroimaging, in part due to the Human Connectome Project (HCP). These sequences allow greater spatial and temporal resolution BOLD imaging, but are susceptible to additional artifacts (such as slice leakage), and possibly more sensitive to motion and physiological artifacts. These complexities mean that multiband imaging datasets cannot be treated as simply higher resolution versions of standard fMRI. The talks in this session will be in the style of tutorials and reviews, aimed at introducing multiband fMRI to a wide neuroimaging audience. The first talk (Benjamin Zahneisen) will introduce the basics of simultaneous multi-slice imaging, including how SMS differs from regular imaging, specific hardware requirements, and challenges of SMS associated with the higher temporal resolution and the limits of ever increasing multi-band factors. The second talk (Benjamin Risk) will describe the impact of multiband acceleration factors on sensitivity and specificity, particularly signal leakage (which can lead to spurious, false positive activations), providing examples from HCP and simulated datasets. The final talk (Annika Linke) will describe study designs and fMRI analysis methods (e.g., temporal ICA) that have benefited from SMS imaging, as well as its limitations for resting state and activation fMRI studies, and experiences and recommendations for infant, pediatric, and patient populations.

SYMPOSIUM SCHEDULE:

8:00 – 8:20

Basics of Simultaneous Multi-Slice Imaging: SNR properties, g-factor penalty, multi-band artifacts, and other challenges associated with high temporal resolution

Benjamin Zahneisen, PhD, Stanford University, Menlo Park, CA, United States

8:20 – 8:40

Impacts of multiband acceleration factors on sensitivity and specificity

Benjamin Risk, PhD, University of North Carolina, Chapel Hill, Chapel Hill, NC, United States

8:40 – 9:00
Recent experiences using SMS imaging in BOLD fMRI studies
Annika Linke, San Diego State University, San Diego, CA, United States

9:00 – 9:15
Questions and Answers

Connectomic insights into brain development before birth

Room: 211-214
Organizer:
Moriah Thomason, PhD, Wayne State University, Detroit, MI, United States

We propose a multinational symposium presenting leading-edge brain connectomic research focused on the beginning of human life. The brain is subject to dramatic developmental processes during the antinatal period, and yet our understanding of this critical early time in development is limited. Emergent non-invasive MRI methodologies are changing the paradigm and allowing investigators to deconstruct the living human connectome, or connectional architecture of the brain, beginning in utero. We will present challenges inherent in fetal and neonatal MRI and will propose solutions for those. We will also present new findings regarding maternal prenatal stress, the preterm brain, and relevance of prenatal brain development to child outcomes. This symposium will increase researcher and clinician knowledge about emergent MRI technologies for non-invasive examination of early human brain development, and will highlight some of the newest discoveries emerging in this area.

SYMPOSIUM SCHEDULE:

8:00 – 8:15
Understanding Fetal Brain Development Across Multiple Modalities
Georg Langs, Medical University of Vienna, Vienna, Austria

8:15 – 8:30
Exploring the Fetal Functional Connectome
Martijn van den Heuvel, Brain Center Rudolf Magnus, Dutch Connectome Lab, University Medical Center Utrecht, Utrecht, The Netherlands

8:30 – 8:45
Influence of the Environment on the Developing Fetal Connectome
Moriah Thomason, Ph.D, Wayne State University, Detroit, MI, United States

8:45 – 9:00
Amygdala Connectivity Develops Across the 3rd Trimester and is Reduced in Preterm Neonates with Prenatal Stress Exposure
Dustin Scheinost, PhD, Yale School of Medicine, New Haven, CT, United States

9:00 – 9:15
Questions and Answers

Neuroplasticity: In search for cellular mechanisms underlying changing cognition using imaging

Room: 220-222
Organizers:
Alfred Anwander, Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany

Tomás Goucha, MD, MSc, Max Planck Institute for Human Cognitive and Brain Sciences/Berlin School of Mind and Brain, Leipzig, Germany/ Berlin, Germany

It is common knowledge that the brain constantly adapts to new challenges by reshaping its structure in order to carry out new functions. These changes were seen for a long time at the level of the synapse, but a paradigm shift has point more towards changes at the macro scale of brain networks. Changes in gray and white matter are observable after skill learning or at the basis of disease, but its mechanisms are still widely unknown. Bogdan Draganski will provide us insights into the validation of imaging methods with quantitative MRI, trying to reach a more comprehensive understanding of plasticity and its underlying mechanisms. Alfred Anwander will show how a long-lasting new cognitive challenge, learning a new language, can be tracked by studying both structure and function and trying to establish causal relationships in brain change. Brian Wandell will use the visual system and reading as a starting point to understand how and where plasticity happens in the human brain, in particular trying to understand how long certain brain areas are able to adapt to new input. Finally, R. Douglas Fields will give us an insight of the micro scale, bridging the gap between insights coming from brain imaging and recent finding in the molecular biology of the nervous system.

SYMPOSIUM SCHEDULE:

8:00 – 8:15
In vivo studies of use - dependent brain tissue property changes
Bogdan Draganski, LREN, CHUV, Lausanne, Switzerland

8:15 – 8:30
Longitudinal multimodal plasticity: Combining structural connectivity, quantitative MRI and fMRI when learning a language
Alfred Anwander, Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany

8:30 – 8:45
Assessing plasticity and development in the visual pathways of individual subjects with quantitative methods
Brian Wandell, Stanford University, Stanford, CA, United States

8:45 – 9:00

Cellular mechanism of brain network plasticity: The role of myelin and glia

R. Douglas Fields, PhD, National Institutes of Health, Bethesda, MD, United States

9:00 – 9:15

Questions and Answers

BREAK

9:15 – 9:30

KEYNOTE LECTURE

9:30 – 10:15

Room: Ballroom AB

Bridging scales with neuroimaging: challenges and opportunities

Karla Miller, PhD, FMRIB Centre, University of Oxford, United Kingdom

Neuroimaging provides unique opportunities to address one of the grand challenges in neuroscience: relating structure and function over many orders of magnitude. I will focus on different aspects of scale and how the next generation of MRI methods will enable us to face this challenge. Themes will include adopting a synergistic approach to acquisition and analysis; relating neuroimaging tools to complementary techniques; and the new era of population neuroimaging.

BREAK

10:15 – 10:30

Oral Sessions

10:30 – 11:45

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. Authors listed are the presenting authors, a full list of authors can be found in the Abstract / Poster Listing Booklet (**www.humanbrainmapping.org/2017Posters**), in the E-poster search (**http://ww5.aievolution.com/hbm1701/**) or in the mobile app.

Anatomy & Physiology

Room: 220-222

Chair:

Kevin S. Weiner, PhD, Stanford University, Palo Alto, CA, United States

10:30 – 10:43

2022: The body parcellates the brain

Esther Kuehn, DZNE, Magdeburg, Germany

10:43 – 10:55

2040: Rostro-caudal architecture of the frontal lobes in humans

Michel Thiebaut de Schotten, Brain Connectivity and Behaviour Group, Paris, France

10:55 – 11:08

2042: Two different pathways connect amygdala and prefrontal cortex in both human and monkey brains

Davide Folloni, Department of Experimental Psychology, University of Oxford, Oxford, United Kingdom

11:08 – 11:20

1983: Receptor expression in primary sensory cortices of man, non-human primates, rodents and marsupials

Nicola Palomero-Gallagher, Research Centre Jülich, Jülich, Germany

11:20 – 11:32

2050: Mapping Asymmetries in the U-shape fibre system of the Human Brain

Francisco De Santiago Requejo, NatBrainLab, Institute of Psychiatry, Psychology & Neuroscience, King's College London, London, United Kingdom

11:32 – 11:45

2056: Prenatal development of major fibre pathways in the human cerebrum revealed by HARDI

Lana Vasung, Harvard Medical School / Boston Children's Hospital, Boston, MA, United States

Brain Stimulation & Behavior

Room: Ballroom C

Chairs:

Yun-Hee Kim, MD, PhD, Sungkyunkwan University School of Medicine, Samsung Medical Center, Seoul, South Korea

Jason L. Neva, PhD, Department of Physical Therapy, University of British Columbia, Vancouver, Canada

10:30 – 10:43

1015: Frequency-dependent tACS modulation of BOLD signal during rhythmic visual stimulation

Yuhui Chai, Section of Functional Imaging Methods, National Institute of Mental Health, Bethesda, MD, United States

10:43 – 10:55

1049: Test-retest reliability of prefrontal tDCS effects on resting-state connectivity in healthy subjects

Jana Woersching, Department of Psychiatry and Psychotherapy, Ludwig-Maximilians-University, Munich, Germany

10:55 – 11:08

1000: Network effects of subthalamic nucleus deep brain stimulation on the prefrontal cortex

F. Konrad Schumacher, Dept. of Neurology, Medical Center, University of Freiburg / Freiburg Brain Imaging Center, Faculty of Biology, BrainLinks-BrainTools Cluster of Excellence, Faculty of Medicine, University of Freiburg, Freiburg, Germany

11:08 – 11:20

1058: Connectomic insights into depression and TMS as a treatment option

Martin Tik, Center for Medical Physics and Biomedical Engineering, Medical University of Vienna, Vienna, Austria

11:20 – 11:32

1051: Investigation on effects of transcranial direct current stimulation through a multi-scale modeling

Hyeon Seo, Gwangju Institute of Science and Technology, Gwangju, Korea, Republic of Korea

11:32 – 11:45

1026: Causal contributions of beta and gamma oscillations to motor control

Inge Leunissen, KU Leuven, Leuven, Belgium

Emotion and Motivation

Room: 211-214

Chair:

Kalina Christoff, PhD, University of British Columbia, Vancouver, Canada

10:30 – 10:43

1386 The seductive power of curiosity: When it overrides physical risk – an fMRI investigation

Johnny King Lau, School of Psychology and Clinical Language Sciences, University of Reading / The Centre for Integrative Neuroscience and Neurodynamics, Reading, United Kingdom

10:43 – 10:55

1395 Fear acquisition induces spatio-temporal patterns of activity from salience to default mode network

Blazej Baczkowski, Max Planck Institute for Human Cognitive and Brain Sciences / International Max Planck Research School NeuroCom, Leipzig, Germany

10:55 – 11:08

1428 Meta-analytic clustering dissociates activation and behavior profiles across reward processing data

Jessica Flannery, Florida International University, Miami, FL, United States

11:08 – 11:20

1389 Brain Network of Emotion Regulation in Soldiers with Trauma

D Rangaprakash, University of California Los Angeles, Los Angeles, CA, United States

11:20 – 11:32

1504 Oxytocin receptor gene polymorphisms modulate the reward system in a non-social decision-making task

Katja Brodmann, Systems Neuroscience and Imaging in Psychiatry, University Medical Center, Goettingen, Germany

11:32 – 11:45

3936 Deep neural network predicts emotional responses using whole brain neuronal activations

Hyun-Chul Kim, Korea University, Seoul, Korea, Republic of Korea

Modeling & Analysis

Room: Ballroom AB

Chair:

Catie Chang, NIH, Bethesda, MD, United States

10:30 – 10:43

1741: Fingerprinting Orientation Diffusion Functions in Diffusion MRI detects smaller crossing angles

Steven Baete, Center for Advanced Imaging Innovation and Research (CAI2R), NYU School Of Medicine / Center for Biomedical Imaging, Dept of Radiology, NYU School Of Medicine, New York, NY, United States

10:43 – 10:55

1703 FreeSurfer image processing pipeline for infant clinical MRI images

Lilla Zöllei, Athinoula A Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Charlestown, MA, United States

10:55 – 11:08

1838 Automated simulation of fMRI experiments

Leila Wehbe, University of California, Berkeley, Berkeley, CA, United States

11:08 – 11:20

4171 Spatial Confidence Sets - Beyond Null Hypothesis Testing of Cluster Size

Alexander Bowring, University of Warwick, Coventry, United Kingdom

11:20 – 11:32

1882 Unravelling the intrinsic functional boundaries of the macaque monkey cortex

Ting Xu, Child Mind Institute, New York, NY, United States

11:32 – 11:45

1790 Adaptive Cortical Parcellations for Source Recon structed EEG/MEG Connectomes

Seyedehrezvan Farahibozorg, University of Cambridge/ MRC Cognition and Brain Sciences Unit, Cambridge, United Kingdom

LUNCH ON OWN

11:45 – 12:45

POSTER SESSION

12:45 – 14:45

Exhibit Hall, Lower Level

Poster Numbers #1000-2223

Authors with ODD numbered posters will present their posters today.

Brain Stimulation Methods: Deep Brain Stimulation, Direct Electrical/Optogenetic Stimulation, Invasive Stimulation Methods Other, Non-invasive Electrical/tDCS/tACS/tRNS, Non-invasive Magnetic/TMS, Non-Invasive Stimulation Methods Other, Sonic/Ultrasound, TDCS, TMS

Disorders of the Nervous System: Addictions, Anxiety Disorders, Autism, Bipolar Disorder, Depressive Disorders, Medical illness with CNS impact (e.g. chemotherapy, diabetes, hypertension), Obsessive-Compulsive Disorder and Tourette Syndrome, Research Domain Criteria studies (RDoC), Schizophrenia and Psychotic Disorders, Sleep Disorders

Emotion and Motivation: Emotion and Motivation Other, Emotional Learning, Emotional Perception, Reward and Punishment, Sexual Behavior

Imaging Methods: BOLD fMRI, Diffusion MRI, Multi-Modal Imaging

Informatics: Brain Atlases, Databasing and Data Sharing, Informatics Other, Workflows

Modeling and Analysis Methods: Bayesian Modeling, Diffusion MRI Modeling and Analysis, EEG/MEG Modeling and Analysis, Exploratory Modeling and Artifact Removal, Motion Correction and Preprocessing, Multivariate modeling, Other Methods, PET Modeling and Analysis, Segmentation and Parcellation, Task-Independent and Resting-State Analysis, Univariate Modeling

Motor Behavior: Brain Machine Interface, Mirror System, Motor Behavior Other, Motor Planning and Execution, Visuo-Motor Functions

Neuroanatomy: Anatomy and Functional Systems, Cortical Anatomy and Brain Mapping, Cortical Cyto- and Myeloarchitecture, Microcircuitry and Modules, Neuroanatomy Other, Normal Development, Subcortical Structures, White Matter Anatomy, Fiber Pathways and Connectivity, Subcortical Structures

Perception and Attention: Attention: Auditory/Tactile/Motor, Attention: Visual, Chemical Senses: Olfaction, Taste, Consciousness and Awareness, Perception and Attention Other, Perception: Auditory/Vestibular, Perception: Multisensory and Crossmodal, Perception: Pain and Visceral, Perception: Tactile/Somatosensory, Perception: Visual, Sleep and Wakefulness

Physiology, Metabolism and Neurotransmission: Cerebral Metabolism and Hemodynamics, Neurophysiology of Imaging Signals, Pharmacology and Neurotransmission and Physiology, Metabolism and Neurotransmission Other

AFTERNOON SYMPOSIA

14:45 – 16:00

Translational functional neuroimaging: from animal models to humans and back again

Room: 211-214

Organizers:

Shella Keilholz, Emory/Georgia Tech, Atlanta, GA, United States

Kai-hsiang Chuang, University of Queensland, Brisbane, Australia

Researchers that traditionally work with human subjects, especially patient populations, have been begun to back-translate their work to animal models in order to better understand the neurophysiological sources of the alterations observed with common neuroimaging techniques like fMRI or functional connectivity. This symposium describes the advantages and challenges of translational and backtranslational research, showcases some of the tools available for the work, and gives examples of successful translational and backtranslational experiments. MRI-based neuroimaging methods are ideal translational tools, as their noninvasive nature and adaptable spatial resolution allows very similar high quality data to be obtained in both humans and small animals. We hope that the talks will encourage greater exploitation of the manipulations available in animal models to better understand the alterations in brain activity and connectivity that are often observed in neurological and psychiatric disorders.

SYMPOSIUM SCHEDULE:

14:45 – 15:00

Motivation for translational and backtranslational imaging

Shella Keilholz, Emory/Georgia Tech, Atlanta, GA, United States

15:00 – 15:15

Circuit dissection of fMRI signals

Yen-Yu Ian Shih, University of North Carolina, Chapel Hill, NC, United States

15:15 – 15:30

Connectivity as biomarker to understand disease progression and treatment response in transgenic models of Huntington's disease

Kai-hsiang Chuang, University of Queensland, Brisbane, Australia

15:30 – 15:45

Forward- and backward-translation between animal and human fMRI studies in drug addiction

Yihong Yang, NIH, Baltimore, MD, United States

15:45 – 16:00

Questions and Answers

Large-Scale Brain Networks and Substance Use Disorders

Room: Ballroom C

Organizer:

Vani Pariyadath National Institute on Drug Abuse, National Institutes of Health, Rockville, MD, United States

Rita Goldstein, PhD, Icahn School of Medicine at Mount Sinai, New York, NY, United States

Substance use disorders (SUDs) are associated with an intricate network of brain regions, indicative of a complex underlying etiology, and neuroimaging tools that enable the monitoring of network function have therefore been particularly helpful in unraveling some of the essential neurobiology. Resting state functional connectivity (rsFC) allows researchers to examine the integrity of neural circuits in the absence of a task. rsFC techniques have offered unique insights into the spatiotemporal dynamics of multiple brain networks and into their role in normative function as well as in neuropsychiatric disorders. Within the context of SUDs, rsFC analysis already appears to be a promising technique for uncovering differences in neurocircuitry central to chronic substance use as well as relapse and recovery from SUDs (Fedota et al., 2015). Recently, the field has witnessed multiple attempts at probing SUD-related circuits from a large-scale network or whole-brain perspective that offer novel and promising insights into SUD neurobiology. With exciting new experimental and analytical techniques related to rsFC on the horizon, now is an opportune time to assess the success of rsFC analyses in SUD research thus far, and to consider possible directions for the future. The goal of the proposed panel is to highlight important insights gleaned from applying large-scale network approaches to understanding SUD-related neurocircuitry, with an emphasis on cutting-edge techniques in the field. The overall mission of the panel is to offer an alternative perspective to the study of SUDs that could speak to new targets for treatment development.

SYMPOSIUM SCHEDULE:

14:45 – 15:00

Large-scale resting state networks involved in nicotine dependence

Amy Janes, McLean Hospital, Belmont, MA, United States

15:00 – 15:15

Cognitive Functioning as a Marker of Resting-State Connectivity in Cocaine Addiction

Rita Goldstein, Ph.D., Icahn School of Medicine at Mount Sinai, New York, NY, United States

15:15 – 15:30
Beyond reward learning: A network-based view of fronto-striatal interactions in pain motivation
Tor Wager, Department of Psychology and Neuroscience, University of Colorado at Boulder, Boulder, CO, United States

15:30 – 15:45
Using causal neuroimaging to map mechanisms of substance use disorders: Insights from whole-brain computational modelling
Morten Kringelbach, University of Oxford/Aarhus University, Oxford, United Kingdom/Aarhus, Denmark

15:45 – 16:00
Questions and Answers

Brain imaging in huge population-level epidemiological studies

Room: Ballroom AB
Organizers:
Gwenaelle Douaud, FMRIB, Oxford University, Oxford, United Kingdom

We feel that it would be very timely to present a symposium on these studies at OHBM, to give visibility to what brain imaging is being done, and how it relates (in different ways in the different studies) to these healthcare/epidemiology studies more broadly. We will present "early" results (including from brain imaging of over 10,000 subjects already!), including associations between the neuroimaging data and other healthcare and lifestyle variables. We also include a presentation covering many complex and challenging methodological issues in such large-scale studies.

SYMPOSIUM SCHEDULE:

14:45 – 15:00
Brain imaging in the German National Cohort
Svenja Caspers, C. und O. Vogt Institut für Hirnforschung Heinrich-Heine-Universität Düsseldorf/Institut für Neurowissenschaften und Medizin, Düsseldorf, Germany/Jülich, Germany

15:00 – 15:15
Brain imaging in the Rhineland Study
Rüdiger Stirnberg, DZNE, Bonn, Germany

15:15 – 15:30
Brain imaging in UK Biobank
Stephen Smith, FMRIB, Oxford University, Oxford, United Kingdom

15:30 – 15:45
Statistical issues in huge epidemiological studies (Presentation material by Simon Cox and Ian Deary)
Simon Cox, Edinburgh University, Edinburgh, United Kingdom

15:45 – 16:00
Questions and Answers

BREAK

16:00 – 16:15

KEYNOTE LECTURE

16:15 – 17:00
Room: Ballroom AB

Early influences on the developmental trajectory of the functional connectome

Damien Fair, PA-C, PhD, Oregon Health & Science University, Portland, OR, United States

Network science, combined with non-invasive functional imaging, has generated unprecedented insights regarding the development of functional architectures supporting complex behavior. The current lecture will provide some insights and considerations of the earliest environmental events that shape these developmental trajectories.

POSTER RECEPTION

17:00 – 18:30
Exhibit Hall, Lower Level
Poster Numbers #1000-2223

MORNING SYMPOSIA

8:00 – 9:15

25 years of BOLDly going: What does the next quarter century hold for fMRI?

Room: 211-214

Organizer:

Ravi Menon, The University of Western Ontario, London, Canada

Coinciding with the 2017 OHBM meeting is the 25th anniversary of the publication of the first three fMRI papers using the BOLD effect. In the quarter century since those seminal papers came out, fMRI has become an essential, noninvasive methodology for the OHBM community and has yielded many insightful contributions about brain function across disciplines as diverse as education, neuroscience and business. Well over 15,000 fMRI papers have been published in over 3000 journals an it's safe to say more than 10 times as many conference abstracts have been submitted. fMRI has even made it into pop culture, with frequent references on TV shows such as House, CSI and Grey's Anatomy. At this important juncture in time, it is worth taking a pause to look back on where fMRI came from, where it stands today and where it is going in the future - especially as many brain initiatives around the world continue to develop around the technique. Uniquely, this symposium will include first person accounts of those historic events combined with perspectives of what has surprised us over the intervening 25 years (Ogawa, Menon, Bandettini). Insightful commentary by two current leaders in MRI hardware and data analytics (wald and and Mourao-Miranda) will attempt to address the future of fMRI. Through this symposium, an entire new generation of researchers will be reconnected with the exciting and inspiring events that lead to the discovery of BOLD and its application to functional brain imaging, and catch a glimpse of where the field may be going.

SYMPOSIUM SCHEDULE:

8:00 – 8:15

On some approaches of fMRI

Seiji Ogawa, PhD, Tohoku Fukushi University, Sendai, Japan

8:15 – 8:30

The early days of FMRI: MCW, MGH and the early developments in the 90's

Peter Bandettini, Section of Functional Imaging Methods, National Institute of Mental Health, Bethesda, MD, United States

8:30 – 8:45

Imagining imaging; prospects for future neuroimaging technology

Lawrence Wald, PhD, Athinoula A. Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Boston, MA, United States

8:45 – 9:00

The past and future of fMRI analysis tools

Janaina Mourao-Miranda, PhD, Max Planck UCL Centre for Computational Psychiatry and Ageing Research, London, United Kingdom

9:00 – 9:15

Questions and Answers

The Neuroethical Implications of Human Brain Mapping

Room: 220-222

Organizers:

Gary Egan, Monash University, Melbourne, Victoria, Australia

Judy Illes, University of British Columbia, Vancouver, British Columbia

Neuroimaging promises to radically improve our ability to identify those at increased risk of developing mental illnesses or other neurological disorders and develop novel interventions that target the mechanisms that underpin them. Neuroimaging also offers the potential of predicting individuals' future behaviour, such as the likelihood of criminal reoffending after release form prison or the likelihood of relapse to addictive drug use. These applications raise important ethical challenges regarding privacy, the rights of the individual versus the public good, and the use of this information by third parties (e.g. employers, educators, insurers and the courts) to discriminate against "high risk" individuals. The question of who should have access to this information and how it is used is of great public concern. Failure to adequately address these challenges can prompt restrictive regulatory responses that impede research and its translation.

SYMPOSIUM SCHEDULE:

8:00 – 8:20

Disorders of Consciousness, Neuroimaging, and Physician-Assisted Death: Interpreting Communication to Establish Competence

Judy Illes, University of British Columbia, Vancouver, British Columbia

8:20 – 8:40

The ethical implications of neuroprediction

Eyal Aharoni, Georgia State University, Atlanta, GA, United States

8:40 – 9:00

Not exactly picture-perfect: Ethical, legal and social implications of the methodological crisis in neuroimaging

Philipp Kellmeyer, Dr. med.; M.Phil.; MD, Department of Neurosurgery, University Medical Center Freiburg, Freiburg, Baden-Württemberg, Germany

9:00 – 9:15

Questions and Answers

Multi-echo fMRI: basics, denoising, and applications to neuroscience

Room: Ballroom C

Organizers:

Prantik Kundu, PhD, Icahn School of Medicine at Mt. Sinai, New York, NY, United States

Jen Evans, NIH, Bethesda, MD, United States

ME-fMRI has been shown to increase BOLD sensitivity compared to regular single echo fMRI. ME-NMR signal decay models can be used to validate BOLD signals at the subject-level and identify a wide variety of non-BOLD artifacts for denoising - greatly decreasing confounds from artifacts and biases from preprocessing.

We propose a course that will enable participants to use this new methodology and highlight the new domains of study that are now possible. This topic is timely since subject-level fMRI and the study of brain dynamics are emerging as new frontiers; these and many other applications require higher fMRI signal fidelity than is afforded by currently standard techniques. Thus, this course will be of considerable interest to a wide range of researchers.

Participants will learn about basic ME acquisition and theory as well as advanced acquisition using the novel multi-band (MBME) technique with comparisons to state-of-the-art fMRI acquisition across field strengths (Poser), ME-ICA denoising strategies (Kundu, Evans), and practical guidance for translational applications (Lombardo, Voon). They will also learn about the benefits and limitations of using ME-ICA denoised data including: improvements of statistical power and effect size (Lombardo), detection of ultraslow BOLD and their validation by ME-fMRI-EEG (Evans), enhancement of the sensitivity of graph theory metrics and increased functional specificity of small subcortical structures in translational studies, (Voon), and applications to studying neurodevelopment in drug-administration contexts (Lombardo). Next to their specific applications, lecturers will take care to provide a balanced overview of published applications of ME-fMRI in human and animal imaging.

SYMPOSIUM SCHEDULE:

8:00 – 8:12

Multi-echo basics

Benedikt A. Poser, Department of Cognitive Neuroscience, Maastricht University, Maastricht, Netherlands

8:12 – 8:24

ME-ICA denoising

Prantik Kundu, PhD, Icahn School of Medicine at Mt. Sinai, New York, NY,United States

8:24 – 8:36

Differentiating slow BOLD changes from baseline drifts

Jen Evans, NIH, Bethesda, MD, United States

8:36 – 8:48

Statistical power improvements using ME-ICA applied to neurodevelopmental disorders

Michael Lombardo, Psychology Department, University of Cyprus, Cyprus

8:48 – 9:00

Enhanced sensitivity of ME-ICA for translational applications

Valerie Voon, University of Cambridge, Cambridge, United Kingdom

9:00 – 9:15

Questions and Answers

Relating connectivity to inter- and intra-individual differences in attention and cognition

Room: Ballroom AB

Organizers:

Emily Finn, National Institute of Mental Health, Bethesda, MD, United States

Monica Rosenberg, Yale University, New Haven, CT, United States

More than a decade of fMRI-based functional connectivity research has established a general blueprint for brain functional organization, but less is known about the interactions between brain regions that occur atop this architecture in the context of ongoing behavior. Although traditional functional connectivity analyses have focused on data acquired at rest, this symposium will demonstrate practical ways that investigators can leverage connectivity analyses during various task states to discover the mechanisms underlying brain network reorganization during ongoing cognition. Studying both the inter- and intra-individual variation in these measures is critical from both a basic scientific perspective as well as a practical one, as mapping from individual brains to individual behaviors is crucial for developing imaging-based biomarkers with robust translational utility.

The speakers at our symposium will present evidence from tasks that probe attention and working memory, as well as during naturalistic paradigms such as reading and listening to narratives. Across all four presentations, we will emphasize the importance of behavior as a ground-truth measurement, demonstrating the manner in which imaging-derived measures can be used to build models capable of predicting behavior both within and across individuals. Specifically, we will describe practical approaches for estimating time-averaged and time-resolved functional connectivity, applying machine learning and cross-dataset prediction, and designing paradigms that lend themselves to inter-subject correlation and real-time fMRI. In each case, we will discuss the importance of combining data-driven approaches with rigorous validation to ensure that results are robust and generalizable.

SYMPOSIUM SCHEDULE:

8:00 – 8:15

Large-scale functional connectivity networks predict individual differences and fluctuations in attention

Monica Rosenberg, Yale University, New Haven, CT, United States

8:15 – 8:30

Functional Connectivity-Based Predictors of Multi-Task Behavioral Performance

David Jangraw, NIMH, Bethesda, MD, United States

8:30 – 8:45

Can brain state be manipulated to emphasize individual differences in functional connectivity?

Emily Finn, National Institute of Mental Health, Bethesda, MD, United States

8:45 – 9:00

The role of neuromodulatory gain in functional brain network dynamics

Mac Shine, Brain and Mind Centre, University of Sydney, Camperdown, New South Wales

9:00 – 9:15

Questions and Answers

BREAK

9:15 – 9:30

KEYNOTE LECTURE

9:30 – 10:15

Room: Ballroom AB

Revisiting Wernicke's Area

Marsel Mesulam, MD, Northwestern University, Chicago, USA

According to the classic language model, Wernicke's area mediates both sentence and word comprehension. Investigations in primary progressive aphasia (PPA) show that word and sentence comprehension have dissociated anatomical substrates and that word comprehension appears to be critically dependent on the left anterior temporal lobe, a region that has remained outside the classic network.

BREAK

10:15 – 10:30

Oral Sessions

10:30 – 11:45

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. Authors listed are the presenting authors, a full list of authors can be found in the Abstract / Poster Listing Booklet (**www.humanbrainmapping.org/2017Posters)**, in the E-poster search (**http://ww5.aievolution.com/hbm1701/**) or in the mobile app.

Brain Organization for Language

Room: 211-214

Chair:

Einat Liebenthal, DSC, Brigham & Women's Hospital, Harvard Medical School, Boston, MA, United States

10:30 – 10:43

3678 Intrinsic functional architecture of Wernicke's, Broca's, and Geschwind's areas of the human speech

Daniel Abrams, Stanford University, Stanford, CA, United States

10:43 – 10:55

1889 Resting-state connectivity predicts task activation in pre-surgical populations

Oiwi Parker Jones, University of Oxford, Oxford, United Kingdom

10:55 – 11:08

3001 Anatomical evidence for an indirect pathway for repetition

Stephanie Forkel, King's College London, London, United Kingdom

11:08 – 11:20

3632 Dorsal and ventral pathways for words and sentences processing

Marco Catani, NATBrainLab, Institute of Psychiatry, Psychology & Neuroscience, King's College London, London, United Kingdom

11:20 – 11:32

3635 Modality-independent individual item and categorial semantic encoding in the left parietal cortex

Andrea Leo, University of Pisa, Pisa, Italy

11:32 – 11:45

1039 NTMS-tractography reveals different errors may involve different segments of the arcuate fasciculus

Davide Giampiccolo, University of Verona, Verona, Italy

Connectivity Methods and Analysis

Room: Ballroom AB

Chairs:

Jessica R. Cohen, PhD, Assistant Professor / Psychology and Neuroscience, University of North Carolina, Chapel Hill, NC, United States

Emily S. Finn, PhD, Postdoctoral Fellow, Section on Functional Imaging Methods, National Institute of Mental Health, Bethesda, MD, United States

10:30 – 10:43
4122 Sparse coupled hidden Markov models to probe temporally overlapping functional network interactions
Thomas Bolton, Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland / University of Geneva, Geneva, Switzerland

10:43 – 10:55
3955 Brain Network Dynamics are Hierarchically Organized in Time
Diego Vidaurre, University of Oxford, Oxford, Oxfordshire, United Kingdom

10:55 – 11:08
3966 Synchronization of fMRI Data Across Subjects and Scans by Orthogonal Transformation
Anand Joshi, Signal and Image Processsing Institute, University of Southern California, Los Angeles, CA, United States

11:08 – 11:20
3915 Evaluation of Non-negative matrix Factorization of grey matter in age prediction
Deepthi Varikuti, Heinrich-Heine-University Düsseldorf, Düsseldorf, Germany / Research Centre Jülich, INM-1, Jülich, Germany

11:20 – 11:32
4032 A dopaminergic signature contributes to similarity in the brain's functional connectome
Nils Kroemer, Technische Universität Dresden, Dresden, Germany / University of Tuebingen, Tuebingen, Germany

11:32 – 11:45
4058 Connectome community structure: Weighted blockmodels versus modularity maximization
Richard Betzel, University of Pennsylvania, Philadelphia, PA, United States

Learning and Memory

Room : Ballroom C

10:30 – 10:43
3703 Neural correlates of durable memories encoding and retrieval across the adult lifespan
Didac Vidal-Piñeiro, University of Oslo, Oslo, Norway

10:43 – 10:55
3705 Representation of temporal memory retrieval in the human precuneus
Qun Ye, East China Normal University, Shanghai, China

10:55 – 11:08
4000 Dynamic Reorganization of the Frontal Parietal Network during Cognitive Control and Episodic Memory
Kimberly Ray, PhD, UC Davis, Sacramento, CA, United States

11:08 – 11:20
3762 Decoding retrieval success and memory content during short-term memory maintenance
Monika Schönauer, University of Tübingen, Tübingen, Germany

11:20 – 11:32
1515 Tracking the emergence of hierarchical conceptual knowledge
David Neville, Donders Institute for Brain,Cognition and Behaviour, Centre for Cognitive Neuroimaging, Nijmegen, The Netherlands

11:32 – 11:45
3566 Memento malum: Negative prediction errors boost episodic encoding via theta band synchrony
James Cavanagh, PhD, University of New Mexico, Albuquerque, NM, United States

Social Neuroscience

Room: 220-222
Chair:
Michael S. Beauchamp, PhD, Baylor College of Medicine, Houston, TX, United States

10:30 – 10:43
4203 Learning the neurobiology of social behavior from data: Four networks underlying social cognition
Daniel Alcalá-López, RWTH, Aachen, Deutschland

10:43 – 10:55
4239 Acculturation is associated with two-brain neural coupling during interaction in ethnic minorities
Edda Bilek, Central Insitute of Mental Health, Heidelberg University, Mannheim, Germany

10:55 – 11:08
4258 Predicting Personality from Network-based Resting-State Functional Connectivity
Alessandra Nostro, Heinrich-Heine University, Düsseldorf, Germany / Research Center Jülich (INM-1), Jülich, Germany

11:08 – 11:20

4223 A Network for Social Interaction Understanding in the Primate Brain

Julia Sliwa, The Rockefeller University, New York, NY, United States

11:20 – 11:32

4201 Unique neural representations of the self

Yina Ma, State Key Laboratory of Cognitive Neuroscience and Learning, Beijing Normal University, Beijing, China

11:32 – 11:45

4226 Social Neuroimaging Meta-Analysis through the RDoC Lens Yields Distinct Context-Driven Cliques

Emily Boeving, M.Sc., Florida International University, Miami, FL, United States

LUNCH ON OWN

11:45 – 12:45

Mentorship and Career Development Symposium: Key Factors to consider for career evolution in neuroimaging

12:00 – 14:30

Room 211-214

Organizers:

OHBM, Student and Postdoc Special Interest Group

The Mentorship and Career Development symposium is a new initiative by the OHBM Student and Postdoc SIG aimed at bringing together researchers at all stages to provide counsel on navigating a career in neuroimaging. The symposium is designed to have a specific theme each year. This year the focus is on early career transitions in academic, as well as non-traditional research routes. The symposium promises a variety of talks from brain mappers that have successfully navigated a neuroscience career in various academic settings around the world, as well as industry input that highlights opportunities to explore outside of academia. The presentations will be followed by a panel discussion from established PI's and industry experts on what they look for in candidates interviewing for various positions. The symposium will also feature tips for grant writing, managing microaggressions and workplace challenges, and seeking a work-life balance. We will present a comprehensive symposium that covers the big questions regarding steering a successful career as a brain mapper. As an extension of the mentorship and career development initiative, this year, the OHBM Student and Postdoc SIG has also announced an online mentorship forum for conference attendees as a continuing effort to help improve support and encouragement across all stages of career development.

POSTER SESSION

12:45 – 14:45

Exhibit Hall, Lower Level

Poster Numbers #3000-4260

Authors with EVEN numbered posters will present their posters today.

Disorders of the Nervous System: Alzheimer's Disease and Other Dementias, Disorders of the Nervous System Other, Eating Disorders, Epilepsy, Other Psychiatric Disorders, Parkinson's Disease and Movement Disorders, Stroke, Traumatic Brain Injury

Genetics: Genetic Association Studies, Genetic Modeling and Analysis Methods, Genetics Other, Neurogenetic Syndromes, Transcriptomics

Higher Cognitive Functions: Decision Making, Executive Function, Higher Cognitive Functions Other, Imagery, Music Reasoning and Problem Solving, Space, Time and Number Coding

Imaging Methods: Anatomical MRI, EEG, Imaging Methods Other, Imaging of CLARITY, MEG, MR Spectroscopy, MIRS, Non-BOLD fMRI, PET, Polarized light imaging (PLI)

Language: Language Acquisition, Language Comprehension and Semantics, Language Other, Reading and Writing, Speech Perception, Speech Production

Learning and Memory: Implicit Memory, Learning and Memory Other, Long-Term Memory (Episodic and Semantic), Neural Plasticity and Recovery of Function, Skill Learning, Working Memory

Lifespan Development: Aging, Lifespan Development Other and Normal Brain Development: Fetus to Adolescence

Modeling and Analysis Methods: \Classification and Predictive Modeling, fMRI Connectivity and Network Modeling, Image Registration and Computational Anatomy, Methods Development

Social Neuroscience: Self Processes, Social Cognition, Social Interaction and Social Neuroscience Other

AFTERNOON SYMPOSIA

14:45 – 16:00

Systems-level Integration of Neuroimaging and Genomic Maps in Health and Disease

Room: Ballroom AB

Organizers:

Armin Raznahan, NIMH, Bethesda, MD, United States

Edward Bullmore, University of Cambridge, Cambridge, United Kingdom

The scientific community gained open access to spatially comprehensive maps of brain gene expression approximately 5 years ago. Since then, the scope of publically available gene expression data has dramatically expanded to include different species and

developmental periods. These data open up exciting new ways of using neuroimaging to understand brain organization, with major benefits for both basic and clinical science. These novel interdisciplinary opportunities come with new technical and theoretical challenges. We will delve into these issues by presenting multiple high-impact implementations of imaging-transcriptomics that (i) introduce key databases, (ii) address technical aspects of data QA, spatial alignment and statistical inference, (iii) link imaging-derived brain networks in development, phylogeny, and disease to underlying molecular substrates. Petra Vertes (Cambridge, UK) will present research linking regional differences in structural brain maturation in humans to patterns of cortical gene-expression in adulthood, which suggests that regions serving as key network hubs are enriched for expression genes involved in energetics and risk for psychosis. Fenna Krienen (Harvard, USA) will present research that compares cortical gene-expression across species and defines specialized gene sets likely to play a central role in patterning of the primate cortex. Alex Fornito (Monash, Australia) will present research integrating tract-tracing and gene-expression data in mice, to define connectional hubs with costly long-range wiring that bear the same enrichment for expression of energetic and neuronal communication genes seen in human brain network hubs. Armin Raznahan (Intramural NIMH, USA) will present studies in humans and mice that define molecular predictors of regional brain vulnerability by linking neuroanatomical effects of genetic risks to maps of brain gene expression.

SYMPOSIUM SCHEDULE:

14:45 – 15:00

Bridging the gap: What six "healthy" post-mortem brains can tell us about disease

Petra Vertes, University of Cambridge, Cambridge, United Kingdom

15:00 – 15:15

How does transcriptional variation relate to cortical specialization?

Fenna Krienen, Harvard Medical School/Broad Institute. Boston, MA/ Cambridge, MA, United States

15:15 – 15:30

Genetic influences on large-scale brain network organization

Fornito Alex, Monash University, Melbourne, Australia

15:30 – 15:45

Linking genetic effects on brain anatomy in neurodevelopmental disorders to intrinsic patterns of cortical gene expression

Armin Raznahan, NIMH, Bethesda, MD, United States

15:45 – 16:00

Questions and Answers

Validating MRI-based biophysical models with gold standard histology: potentials and limitations

Room: 211-214

Organizer:

Nikolaus Weiskopf, Department of Neurophysics, Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany

Recent breakthroughs in MRI methodology and biophysical modelling of the MR signal brought quantitative in vivo MRI markers with sub-millimeter resolution and high specificity to microscopic tissue compartments within reach (e.g. MRI markers for myelin, axon, or iron concentration). However, ex vivo histology remains the gold standard against which these MRI markers have to be validated before they can be reliably used for clinical research or studying neuroscientific questions. Today, several challenges need to be overcome to achieve quantitative validation of these MRI markers: (i) understanding and modelling the changes occurring post mortem, e.g. autolysis, temperature changes and fixation, which significantly alter the MRI signal and the tissue morphology, (ii) accounting for the scale gap between histological methods, which is typically performed on small 2D sections of tissue (millimeters to few centimeters) with a microscopic resolution (~ 1 micron), and macroscopic MRI, which is performed on the whole three-dimensional brain at a macroscopic resolution (~ 1 millimeter), (iii) finding the most reliable, reproducible, and quantitative histological techniques to serve as the gold standard measurement tools for automated quantification of tissue compartments, ideally over the entire brain. This symposium is comprised of four lectures that introduce a broad range of promising methods to tackle these challenges.

SYMPOSIUM SCHEDULE:

14:45 – 15:00

Quantitative iron mapping and 3D histology for quantitative MRI

Evgeniya Kirilina, Department of Neurophysics, Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany / Center for Cognitive Neuroscience Berlin, Free University Berlin, Berlin, Germany

15:00 – 15:15

Histological validation of myelin biomarkers in white matter

Nikola Stikov, École Polytechnique, Université de Montréal, Montreal, Canada

15:15 – 15:30

Volumetric mapping of cyto- and myelo-architectural features and fiber axis orientation with polarization sensitive optical coherence tomography

David Boas, The Optics Division, Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Boston, MA, United States

15:30 – 15:45

From in vivo to ex vivo: the effect of autolysis and fixation on quantitative MRI markers

Gunther Helms, Department of Clinical Sciences, Lund University, Lund, Sweden

15:45 – 16:00

Questions and Answers

Exploring complex relationships between evoked and intrinsic brain activity

Room: Ballroom C

Organizer:

Lucina Uddin, University of Miami, Coral Gables, FL, United States

Traditionally, cognitive neuroscience has focused on either stimulus-driven, task-evoked brain activity or intrinsic resting state brain activity. However, it is becoming increasingly apparent that characterization of either form of brain activity in isolation does not provide a complete picture of functional brain organization. Moreover, previous assumptions that task-evoked and intrinsic brain activity sum linearly have recently been called into question. The speakers will discuss several novel theoretical frameworks and analytic approaches that have emerged for characterizing complex relationships between evoked and intrinsic brain activity. Using this approach, we aim to widen the discourse around assumptions associated with analysis of brain responses to external task demands and spontaneous brain activity, providing suggestions for moving the field to a more comprehensive understanding of human brain function.

SYMPOSIUM SCHEDULE:

14:45 – 15:00

Dynamic and overlapping brain networks for emotion and cognition

Luiz Pessoa, University of Maryland, College Park, MD, United States

15:00 – 15:15

A holistic view of spontaneous and evoked activity in human brain imaging

Biyu He, New York University Langone Medical Center, New York, NY, United States

15:15 – 15:30

Activity flows over intrinsic and task-evoked functional networks shape cognitive task activations

Michael Cole, The Cole Neurocognition Lab, Center for Molecular & Behavioral Neuroscience, Rutgers University, New Brunswick, NJ, United States

15:30 – 15:45

Considering evoked and intrinsic functional brain network architectures

Lucina Uddin, University of Miami, Coral Gables, FL, United States

15:45 – 16:00

Questions and Answers

BREAK

16:00 – 16:15

KEYNOTE LECTURE

16:15 – 17:00

Room: Ballroom AB

Multiple brain systems for decision making?

Christian Ruff, PhD, University of Zurich, Zurich, Switzerland

Neuroimaging studies often focus on brain processes that are specialized for perceptual, motivational, or social information. My lecture describes how these sources of information are flexibly integrated by the brain to control behaviour. Our recent studies characterize such neural choice processes with computationally-informed neuroimaging and brain stimulation methods.

BREAK

17:00 – 17:15

Town Hall Forum

Room: Ballroom AB

The Town Hall Forum is the top source for the latest breaking news and commentary on issues impacting the neuroimaging community and your member organization. It is also an opportunity for you to voice your opinions and questions to the Council – which helps shape future agendas. The new elected leadership will be announced as well as dates and venues for future Annual Meetings.

CLUB NIGHT

Location: Science World

OHBM's legendary Club Night promises to be another don't-miss event as we go to the Science World at TELUS World of Science! This unique venue is located on the beautiful False Creek and is easily accessible via transit to the Main Street-Science World Train Station or via Aquabus/False Creek ferries. There will be a DJ "Girl on Wax" that will play dance music throughout the evening, and you can access all the hands-on activities the Science World as to offer. Don't miss the food trucks that will offer a variety of foods for purchase from Thai' to the famous Vancouver Poutine!

The party is complimentary to registrants. **Please make sure to bring your ticket to Club Night.** Additional guest tickets are $50.00 and must be purchased at the conference registration desk.

Address: 1455 Quebec Street, Vancouver

MORNING SYMPOSIA

8:00 – 9:15

Interaction of neuronal oscillations in multiple spatio-temporal scales: from methods to cognition

Room: 211-214

Organizer:

Laura Marzetti, University of Chieti-Pescara, Chieti, Italy

Interactions between brain rhythms in the [1-100] Hz frequency range, which correspond to time scales relevant to behavior, emerge from spatially distributed networks and represent a mechanism for the integration of information across space and time to support cognitive processing. Clearly, being able to understand this mechanism would have a great impact on the notion of brain networks, e.g. by allowing for a multiscale dynamic characterization. Cutting-edge research both from the methods and the neuroscience side is currently performed to highlight the cognitive relevance of CFC.

This symposium, by bringing together experts in methods and neuroscientists, will offer the OHBM attendees a unique opportunity to learn the most recent methodological developments in the field, as well as to familiarize with the opportunities offered by these approaches to address system neuroscience questions with either non invasive or invasive electrophysiology. Specifically, the learning objectives of this symposium will cover the understanding of: i) cutting edge methods to address the question of cross-frequency coupling through electrophysiology, ii) the cognitive relevance of cross-frequency coupling, iii) the use of cross-frequency based quantities to decode brain intention and action.

SYMPOSIUM SCHEDULE:

8:00 – 8:15

Cross-frequency synchronization in MEG/EEG: methodological considerations and empirical evidence.

Laura Marzetti, University of Chieti-Pescara, Chieti, Italy

8:15 – 8:30

Analyzing higher harmonics of the alpha-rhythms

Guido Nolte, Department of Neurophysiology and Pathophysiology, Universitaetsklinikum Hamburg-Eppendorf, Hamburg, Germany

8:30 – 8:45

Cross-frequency synchronization connects networks of fast and slow oscillations during visual working memory maintenance

Satu Palva, Neuroscience Center, University of Helsinki, Helsinki, Finland

8:45 – 9:00

Decoding motor intentions and actions through cross-frequency coupling

Karim Jerbi, Prof, Département de Psychologie Université de Montréal, Montréal, Canada

9:00 – 9:15

Questions and Answers

MORNING SYMPOSIA

8:00 – 9:15

Near and far: imaging the remote effects of ischemic stroke and cerebrovascular disease burden

Room: Ballroom C

Organizer:

Amy Brodtmann, MBBS FRACP PhD, Florey Institute of Neuroscience and Mental Health, Melbourne, Victoria, Australia

What happens to the human brain after stroke? Most researchers have focused on improving methods to image recovery, using poststroke changes as a model of neural plasticity. But the reality in more complex. We are dealing with aging brains, meaning that some of our assumptions may not hold, including those regarding BOLD signal changes based on evidence from younger people. White matter hyperintensities and microinfarcts are not estimated or included in much of our modelling. Changes can occur in regions that have not been directly affected by the infarct; both within the affected hemisphere and more remotely, especially the hippocampi and thalami. There is now evidence that the brain atrophies at an accelerated rate after brain infarction. Some of these changes are dynamic, especially cortical thickness and hippocampal change, but some appear progressive, associated with cognitive decline. Stroke is strongly associated with cognitive decline and dementia – one third of stroke patients have dementia 3-5 years after their event. Yet most researchers focus on recovery, assuming that the brain is stable over time. Attendees will be provided an overview of the evidence of structural brain aging associated with brain ischemia and infarction as a background for the presentations, introducing the concept of vascular neurodegeneration. Brodtmann will present an overview of evolving concepts of vascular degeneration. Forkel will discuss the use of diffusion imaging to provide important information on white matter tracts in aphasia recovery. Veldsman will present a more direct method of examining atrophy within networks at correlations in the rate of cortical atrophy – termed here atrophic covariance – rather than just correlations in the morphometric measure itself. Egorova will discuss the use of seed-based connectivity versus frequency-specific approaches in stroke patients, using networks affected by depression as the model. Longitudinal imaging has the benefit of overcoming interindividual differences in cortical morphology by using each individual as their own control.

SYMPOSIUM SCHEDULE:

8:00 – 8:10

Introduction to the imaging of vascular degeneration

Amy Brodtmann, MBBS FRACP PhD, Florey Institute of Neuroscience and Mental Health, Melbourne, Victoria, Australia

8:10 – 8:30
White matter imaging in stroke populations
Stephanie Forkel, PhD, King's College London, London, United Kingdom

8:30 – 8:45
Network-driven atrophy after stroke: structural versus atrophic covariance
Michele Veldsman, PhD, University of Oxford, Oxford, United Kingdom

8:45 – 9:00
Resting state brain functioning following stroke: the case of post-stroke depression
Natalia Egorova, PhD, Florey Institute of Neuroscience and Mental Health, University of Melbourne, Melbourne, Australia

9:00 – 9:15
Questions and Answers

Individualized Mapping and Causal Manipulation of Human Brain Circuits

Room: Ballroom AB
Organizers:
Amit Etkin, MD, PhD, Stanford University, Stanford, CA, United States

Over the past two decades, neuroimaging studies have defined a set of distributed brain systems that contribute to cognition, emotion, mood and other mental processes. Perturbations in these circuits have been identified in different ways across psychiatric and neurological disorders when comparing groups of patients to healthy individuals. The challenge ahead of us is how to use these insights to: 1) elucidate the nature of neural circuit deficits in individual patients and their relevance for treatment, and 2) establish the causal mechanisms regulating circuit function in health and illness, and 3) develop non-invasive circuit-based therapeutics. This symposium brings together research in healthy individuals as well as patients with psychiatric or neurological disorders, along with multi-site neuroimaging data analyses and circuit manipulation using transcranial magnetic stimulation (TMS) concurrent with neuroimaging, to identify paths forward on each of these challenges. Speakers will show how large-scale neuroimaging data analyses can discover and validate brain circuitry-defined subtypes of major depression, demonstrate how a circuit perspective can explain diverse lesion syndromes even when they do not converge on single anatomical locations, elucidate causal mechanisms for normal prefrontal control of amygdala activity and its dysfunction in post-traumatic stress disorder using concurrent TMS and functional magnetic resonance imaging (TMS/fMRI), and establish a neurophysiological basis for repetitive TMS-mediated treatment for depression using concurrent TMS and electroencephalography (TMS/EEG). Together, these data suggest that we are now on the brink of innovations in "rational" circuit-based diagnosis and treatments for neuropsychiatric disorders, as well as a far greater mechanistic understanding of these circuits in health and disease.

SYMPOSIUM SCHEDULE:

8:00 – 8:15
Resting State Connectivity Biomarkers Define Neurophysiological Subtypes of Depression
Conor Liston, MD, PhD, Cornell University, New York, NY, United States

8:15 – 8:30
Mapping neuropsychiatric symptoms to brain circuits based on causal brain lesions
Michael Fox, Harvard Medical School, Boston, MA, United States

8:30 – 8:45
Causal amygdala control by the prefrontal cortex in humans
Amit Etkin, MD, PhD, Stanford University, Stanford, CA, United States

8:45 – 9:00
Intracortical inhibition underlies the antidepressant effect of repetitive transcranial magnetic stimulation
Corey Keller, MD PhD, Stanford University, Stanford, CA, United States

9:00 – 9:15
Questions and Answers

Brain-to-brain synchrony early in life: What can we learn from different hyperscanning techniques?

Room: 220-222
Organizers:
Kerstin Konrad, RWTH, Aachen, Germany

Yasuyo Minagawa, Department of Humanities and Social Sciences, Tokyo, Japan

Hyperscanning techniques allow the simultaneous recording of brain activity of different subjects. With the advent of sophisticated new tools and techniques over the past decades, it is now possible to study the inter-brain correlations between cerebral activity of a group of interacting subjects as a unique system. Ecologic experimental designs can be adopted to create an interaction between subjects similar to real life social situations, thus, hyperscanning represents a potentially revolutionary new approach, opening new perspectives for understanding the evolution and development of typical and atypical human social interactions. Given these new opportunities, it appears timely and important to reflect and discuss open questions and current challenges and limitations of different hyperscanning techniques. These include (1) review of experimental tasks suited for hyperscanning across different age groups (from infancy to adulthood) and neuroimaging techniques (EEG, NIRS, fMRI); (2) methodological approaches (such as frequency-based connectivity estimators in EEG hyperscanning, and calculation of temporal correlation and Granger-based causality used on hemodynamic data, i.e., obtained with fMRI and NIRS), (3) impact of subjects' characteristics (such as age and gender) on neural synchrony measures; (4) behavioral correlates of brain-to-brain synchrony. This symposium intends to provide a forum to stimulate the discussion

of these and other issues. Clinical implications will be highlighted, particularly with respect to the relevance of early social interaction for mental health across the life-span. In a nutshell, the symposium aims at providing up-to-date knowledge on hyperscanning techniques of social interactions during human development. Each presenter brings long-standing unique and complementary expertise to the table, making the sum greater than the parts.

SYMPOSIUM SCHEDULE:

8:00 – 8:15

Hyperscanning techniques and social cognitive neuroscience: where are we now?

Laura Astolfi, Department of Computer, Control, and Management Engineering, Rome, Italy

8:15 – 8:30

Neural underpinnings of mutual gaze and joint attention using hyperscanning functional MRI

Hiroki Tanabe, Department of Cerebral Research, Okazaki, Aichi, Japan

8:30 – 8:45

Exploring the neural evidence of mother-infant entrainment: Inter-brain synchronized hemodynamic activity

Yasuyo Minagawa, Department of Humanities and Social Sciences, Tokyo, Japan

8:45 – 9:00

Is brain-to-brain synchrony of parent-child dyads related to the child's ability to regulate affect?

Vanessa Reindl, RWTH, Aachen, Germany

9:00 – 9:15

Questions and Answers

BREAK

9:15 – 9:30

KEYNOTE LECTURE

9:30 – 10:15

Room ABC

'Preperception' in the human brain

Professor Kia Nobre, FBA Chair in Translational Cognitive Neuroscience Head of Department for Experimental Psychology Director of the Oxford Centre for Human Brain Activity University of Oxford

Attention refers to the set of mechanisms that tune psychological and neural processing to focus on the relevant events to guide adaptive behavior. According to the standard model, goal-based representations facilitate neural processing by biasing activity according to receptive-field properties. I will extend the standard model, by discussing research that reveals additional sources of biases, such as long-term memories associated with anticipated events; shows that biases also influence neural activity based on the timing of events; and illustrates how biases continue to shape neural activity within memory representations.

BREAK

10:15 – 10:30

Oral Sessions

10:30 – 11:45

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. Authors listed are the presenting authors, a full list of authors can be found in the Abstract / Poster Listing Booklet (**www.humanbrainmapping.org/2017Posters**), in the E-poster search (**http://ww5.aievolution.com/hbm1701/**) or in the mobile app.

Higher Cognitive Functions

Room: Ballroom C

Chair:

Michael W. Cole, PhD, Assistant Professor, The Cole Neurocognition Lab, Center for Molecular & Behavioral Neuroscience, Rutgers University, New Brunswick, NJ, United States

10:30 – 10:43

3355 Characterization of sub-networks within an extended Multiple Demand Network

Julia Camilleri, Research Centre Jülich, INM-1, Jülich, Germany / Heinrich-Heine University, Düsseldorf, Germany

10:43 – 10:55
3379 Human ECoG reveals dissociable calculations for perceptual decisions and confidence judgments
Megan Peters, PhD, University of California Los Angeles, Los Angeles, CA, United States

10:55 – 11:08
3501 A computational trial-by-trial EEG analysis of hierarchical prediction errors
Sara Tomiello, Translational Neuromodeling Unit (TNU), UZH & ETH Zurich, Zurich, Switzerland

11:08 – 11:20
3359 Fractioning frontoparietal brain networks using neuroadaptive Bayesian optimization
Romy Lorenz, Imperial College London, London, United Kingdom

11:20 – 11:32
3756 Towards mapping the neural substrates of the residual variance in human working memory
Christelle van Antwerpen, University of Bristol, Bristol, United Kingdom

11:32 – 11:45
1355 Functional brain networks underlying impaired disconfirmatory evidence integration in schizophrenia
Katie Lavigne, University of British Columbia, Vancouver, British Columbia, Canada

Imaging Methods

Room: Ballroom AB
Chair:
Bruce Pike, PhD, CAIP Chair in Healthy Brain Aging, Head, Division of Image Science, Professor of Radiology and Clinical Neurosciences, Hotchkiss Brain Institute, Cumming School of Medicine, University of Calgary, Calgary, Canada

10:30 – 10:43
3613 Diattenuation Imaging – A New Extension to 3D-Polarized Light Imaging
Miriam Menzel, Forschungszentrum Jülich, Jülich, Germany

10:43 – 10:55
3537 Single-shot Spiral fMRI at 7 T with High Resolution and Geometric Fidelity
Jakob Heinzle, Translational Neuromodeling Unit, IBT, University of Zurich and ETH Zurich, Zurich, Switzerland

10:55 – 11:08
3453 Separating positive and negative susceptibility sources in quantitative susceptibility mapping (QSM)
Jingu Lee, Department of Electrical and Computer Engineering, Seoul National University, Seoul, Republic of Korea

11:08 – 11:20
3541 Deriving quantitative susceptibility maps from dynamic multi-shot echo-planar imaging
Vanessa Wiggermann, University of British Columbia, Vancouver, British Columbia, Canada

11:20 – 11:32
1546 Exploring motion navigator choices in the TURBINE motion correction scheme for fMRI
Nadine Graedel, Oxford Centre for Functional MRI of the Brain, University of Oxford, Oxford, United Kingdom

11:32 – 11:45
3545 Imaging Brain Tissue with Ultra Short T2 Relaxation Times
Christoph Rettenmeier, University of Hawaii, Honolulu, HI, United States

Lifespan Development

Room: 220-222
Chair:
Ted Satterthwaite, MD, MA, Department of Psychiatry at the University of Pennsylvania Perelman School of Medicine, Philadelphia, PA, United States

10:30 – 10:43
3778 Longitudinal changes in the cerebral cortex functional organization of healthy elderly individuals
Joanna Su Xian Chong, Duke-National University of Singapore Medical School, Singapore

10:43 – 10:55
3860 Adolescent development of structural brain networks
Frantisek Vasa, University of Cambridge, Cambridge, United Kingdom

10:55 – 11:08
3862 Connectome wide association study of sex differences in functional connectivity across puberty
Katherine Reding, Behavioral Endocrinology Branch, National Institute of Mental Health, Bethesda, MD, United States

11:08 – 11:20
3872 Longitudinal Mapping of Development of Cortical Thickness and Surface Area during the First Year
Gang Li, Department of Radiology and BRIC, University of North Carolina at Chapel Hill, Chapel Hill, NC, United States

11:20 – 11:32
3840 Deep learning reveals brain features associated with preterm birth and perinatal risk factors
Manuel Hinojosa Rodriguez, MD., Autonomous National University of Mexico, Mexico City, Mexico

11:32 – 11:45
3844 Multivariate framework for detecting changes in brain areal organization across the lifespan
Ting Xu, Child Mind Institute, New York City, NY, United States

Neurological Disorders

Room: 211-214
Chair:
Michael D. Fox, MD, PhD, Assistant Professor of Neurology, Harvard Medical School, Director, Laboratory for Brain Network Imaging and Modulation, Associate Director, Berenson-Allen Center for Noninvasive Brain Stimulation, Associate Director, Deep Brain Stimulation Program, Boston, MA, United States

10:30 – 10:43
3294 Multi-modal Imaging Disease Progression Scores as Quantitative Traits in GWAS of the ADNI Cohort
Marzia Scelsi, University College London, Translation Imaging Group, Centre for Medical Imaging Computing, London, United Kingdom

10:43 – 10:55
3186 Resting State Functional Connectivity in Parkinsonian Monkeys
Joonas Autio, PhD, RIKEN Center for Life Science Technologies, Hyogo, Japan

10:55 – 11:08
3188 High intensity focused ultrasound subthalamotomy modulates metabolic networks in Parkinson's disease
Rafael Rodriguez-Rojas, Centro Integral de Neurociencias A.C., HM Hospitales- Puerta del Sur, CEU-San Pablo University Madrid, Spain

11:08 – 11:20
3243 Functional connectivity biomarkers of impairment and recovery in a large cohort of stroke patients
Dengfeng Huang, Medical Physics, Dept. of Radiology, University of Freiburg, Freiburg, Germany

11:20 – 11:32
3212 Network Atrophy in Early Stage Predicts Longitudinal Rate of Progression in Parkinson's Disease
Seyed-Mohammad Fereshtehnejad, Mcgill University, Montreal, QC, Canada

11:32 – 11:45
3050 Functional connectivity deficits/enhancements depend on atrophy proximity in frontotemporal dementia
Jesse Brown, PhD, University of California San Francisco, San Francisco, CA, United States

LUNCH

12:00 – 12:45

POSTER SESSION

12:45 – 14:45
Exhibit Hall, Lower Level
Poster Numbers #3000-4261
Authors with ODD numbered posters will present their posters today.

Disorders of the Nervous System: Alzheimer's Disease and Other Dementias, Disorders of the Nervous System Other, Eating Disorders, Epilepsy, Other Psychiatric Disorders, Parkinson's Disease and Movement Disorders, Stroke, Traumatic Brain Injury

Genetics: Genetic Association Studies, Genetic Modeling and Analysis Methods, Genetics Other, Neurogenetic Syndromes, Transcriptomics

Higher Cognitive Functions: Decision Making, Executive Function, Higher Cognitive Functions Other, Imagery, Music Reasoning and Problem Solving, Space, Time and Number Coding

Imaging Methods: Anatomical MRI, EEG, Imaging Methods Other, Imaging of CLARITY, MEG, MR Spectroscopy, MIRS, Non-BOLD fMRI, PET, Polarized light imaging (PLI)

Language: Language Acquisition, Language Comprehension and Semantics, Language Other, Reading and Writing, Speech Perception, Speech Production

Learning and Memory: Implicit Memory, Learning and Memory Other, Long-Term Memory (Episodic and Semantic), Neural Plasticity and Recovery of Function, Skill Learning, Working Memory

Lifespan Development: Aging, Lifespan Development Other and Normal Brain Development: Fetus to Adolescence

Modeling and Analysis Methods: Classification and Predictive Modeling, fMRI Connectivity and Network Modeling, Image Registration and Computational Anatomy, Methods Development

Social Neuroscience: Self Processes, Social Cognition, Social Interaction and Social Neuroscience Other

CLOSING COMMENTS AND MEETING HIGHLIGHTS

14:45 – 16:00
Room: Ballroom AB
During the closing, attendees will enjoy a presentation showcasing the highlights from the 2017 Annual Meeting. This year's presentation will be delivered by Pedro Valdes-Sosa, Joint Cuba/China Laboratory for Neurotechnology Cuban Neuroscience Center/University Electronic. The recipient of the People's Choice Awards will also be announced.

FAREWELL POSTER RECEPTION

16:00 – 17:30
Exhibit Hall, Lower Level
Poster Numbers #3000-4261

OHBM 2017 MERIT ABSTRACT AWARDS

Congratulations to the following 2017 Merit Abstract Awardees

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Daniel Alcalá-López
SAHIL BAJAJ
Derek Beaton
Richard Betzel
Edda Bilek
Emily Boeving
Thomas Bolton
Katja Brodmann
Jesse Brown
Jessica Bulthé
Yuhui Chai
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Seyedehrezvan Farahibozorg
Seyed-Mohammad Fereshtehnejad
Jessica Flannery
Davide Folloni
Stephanie Forkel
Francisco J. Fritz
Davide Giampiccolo
Tal Golan
Robbert Harms
Samuel Harrison
Katja Heuer
Seok-Jun Hong
Dengfeng Huang
Yan Jin
Mayank S. Jog
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Darwin Martínez Riaño
Bahram Mohajer
Shruti Naik
Gustavo Pamplona
Pablo Reyes
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Hyeon Seo
Werner Stoltsz
Anne Uhlmann
Thania Balducci

DISCLOSURES

OHBM 2017 Disclosure Statements
The OHBM Program Committee reviewed all financial disclosures for speakers presenting at the Annual Meeting and determined there were no conflicts of interest.

ACKNOWLEDGEMENTS

The Organization for Human Brain Mapping wishes to thank the following companies for their generous financial support of the OHBM 2017 Program:

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Replication Award Funding

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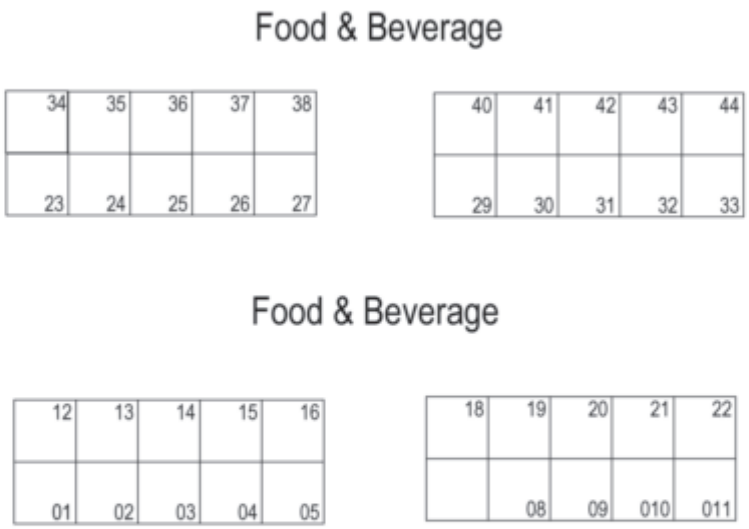
EXHIBITOR LAYOUT

2017 OHBM Annual Meeting Exhibitor Layout



Exhibitors and Booth Locations

1 & 2	Brain Products GmbH
3	BIOPAC Systems, Inc.
4 & 5	Rogue Reseach, Inc.
8	Soterix Medical
9	g.tec medical engineering GmbH
10	Compumedics Neuroscan
11	Siemens Healthineers
12 & 13	Electrical Geodesics, Inc. (EGI)
14	Psychology Software Tools
15 & 16	Resonance Technology, Inc.
18	NITRC
19	NIRx Medical Technologies, LLC
20	BESA GmbH
21	BrainVision Analyzer 2
22	Elsevier B.V.
23	Optoacoustics Ltd
24	Brainnetome Center
25	Cortech Solutions, Inc.
26	Easycap GmbH
27	Brain Vision Solutions
29	Localite GmbH
30	VPixx Technologies
31	Skope
32	NDI
33	Rogue Resolutions
34	Mint Labs
35	Frontiers
36	Flywheel
37	ANT-Neuro America
38	Brain Innovation bv
41	NEUROPHET, Inc.
42	SR Research
43	Elekta OY
44	CTF MEG

Please Support Our Exhibitors!

Hours:
Monday, June 27: 11:00-16:00
Tuesday, June 28: 11:00-18:30
Wednesday, June 29: 11:00-16:00
Thursday, June 30: 11:00-17:30

Other Events in Exhibit Hall:
Lunch For Sale Daily
Coffee Breaks
Poster Reception, Tuesday, June 27th at 17:00
Poster Reception, Thursday, June 29th at 16:00

Table Top Exhibitors:
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608-204-0878
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ANT Neuro offers products tailored to the needs of clinical neuroscientists. ANT's eego line of EEG products enables efficient collection of high density EEG data (8 – 256 channels) either at rest or during movement. ANT also offers the visor2 system for image guided TMS navigation as well as mapping of motor or speech cortical areas.

BESA GmbH
Booth #20
Germany
Web: www.besa.de
49 89 8980 9966
Email: tobias.scherg@besa.de

BESA GmbH was founded in 1995 by Professor Michael Scherg. BESA Research is the leading commercial software package for EEG and MEG data analysis. Analysis options range from pre-processing to advanced source analysis, connectivity, and statistical analysis. BESA Research is used in more than 1500 universities and hospitals world-wide.

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Brain Innovation provides leading software for brain imaging analysis and visualization that scales from mobile devices (iOS, Android) to high performance GPU workstations. Our major products include BrainVoyager for multi-modal data analysis (MRI, fMRI, DWI, EEG, MEG), Turbo-BrainVoyager and Turbo-Satori for real-time fMRI / fNIRS, and TMS Neuronavigator for (f)MRI guided TMS navigation.

Brain Products GmbH
Booth #1 & 2
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Web: www.brainproducts.com
0049 8105 733 840
Email: sales@brainproducts.com

Brain Products dedicates itself to the research and understanding of the human brain and nervous system. The focus on positively impacting neuroscience made Brain Products the worldwide leading manufacturer of hard and software solutions for neurophysiological research. Our solutions cover the fields of: ERP, BCI, EEG/fMRI, EEG/TMS, plus sports, sleep, behavioral sciences and similar disciplines. Come by and see our new active electrodes, the actiCAP Slim, the actiCAP Snap. As well as our new 8 and 16 channel LiveAmp.

Brain Vision Solutions
Booth #27
Canada
Web: http://bv-solutions.com/
877-EEG4MRI
Email: office@bv-solutions.com

Brain Vision Solutions dedicates itself to the research and understanding of the human brain and nervous system. Our fully serviced solutions cover the fields of: ERP, BCI, EEG/fMRI, EEG/TMS, as well as sports, sleep, behavioral sciences and similar disciplines. At Brain Vision, a solution is only a solution if it covers all the researcher's needs. We also provide caps, sensors, easily integrable stimulation software and much more.

Brainnetome Center
Booth #24
China
Web: www.brainnetome.org
86 10 8254 4523

Brainnetome Center is a core department of Institute of Automation, Chinese Academy of Sciences, which locates in Beijing. It is playing a leading and fundamental role in Chinese brain imaging studies. In the last 6 years, the team has created a new human brain atlas, i.e. the Human Brainnetome Atlas.

BrainVision Analyzer 2
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Elekta is global leader in magnetoencephalography (MEG) instrumentation with over 100 systems installed, now available with zero helium boil-off technology. MEG is completely non-invasive, mapping brain activity with millimeter-millisecond resolution. Clinically, MEG is accepted for pre-surgical planning, especially in epilepsy, and it continues to offer unique insights in neuroscience research.

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Localite GmbH
Booth #29
Germany
Web: www.localite.de
49 2241 14 2174
Email: info@localite.de

Localite is a german manufacturer of unique medical navigation systems for research and therapy and supports leading researchers all over the world. In this year's exhibition Localite presents its flagship product TMS Navigator. Among the exciting features are support for brain mapping, robotic assisted coil positioning and MRI compatibility.

Mint Labs
Booth #34
Spain
Web: www.mint-labs.com
34933282007
Email: info@mint-labs.com

Mint Labs provides a cloud-based neuroimaging platform with advanced data management, analysis, and state-of-the-art 3D touchless visualization capabilities to better understand the human brain. The platform supports the neuroimaging R&D workflow, thus ensuring reproducible results, better collaboration, and accelerating the discovery and development of new therapies for neurological diseases

NDI
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Canada
Web: www.ndigital.com
519-884-5142
Email: msci@ndigital.com

NDI is a leading innovator and manufacturer of 3D measurement solutions. Our Krios handheld digitizing scanner integrates with neurodiagnostic systems to measure, identify, and map sensor positions to streamline electrode localization and registration. The Krios improves setup accuracy and efficiency; the process from electrode scanning to labelling takes only minutes

NIRx Medical Technologies, LLC
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United States
Web: www.nirx.net
323-648-6682
Email: info@nirx.net

NIRX is a world-leader in providing integrated solutions for fNIRS neuroimaging. In 1988 we introduced tomographic imaging (i.e., multi-distance measurements) in dense scatter media base on the diffusely scattered light. This approach has since been widely adapted and has served to launch the modern day field of fNIRS tomography

NEUROPHET Inc.
Booth #41
Soth Korea
Web: www.neurophet.com
+82-10-5004-8779
Email: jkbeen@neurophet.com

NEUROPHET is a Korea corporation to develop professional softwares in neuroscience field for medical and research purpose. For the first product, NEUROPHET is launching a powerful simulation software for analyzing the effect of electrical brain stimulation such as tDCS and TMS. With advanced technologies, NEUROPHET provides powerful analytic strategies for researchers and doctors to better understand EBS.

NITRC
Booth #18
United States
Web: www.nitrc.org
202-986-5533
Email: nitrcinfo@nitrc.org

Funded by the NIH, NITRC (Neuroimaging Tools and Resources Collaboratory- www.nitrc.org) freely offers a complete solution to the problem of finding, developing, and sharing neuroimaging and neuroinformatics software tools, finding and sharing large-scale imaging datasets, and manipulating the software and the data in high-performance and cloud computing environments.

Optoacoustics Ltd

Booth #23
Israel
Web: http://www.optoacoustics.com
+972 3-634-4488
Email: info@optoacoustics.com

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Psychology Software Tools

Booth #14
Unites States
Web: http://www.pstnet.com/
412-449-0078
Email: sales@pstnet.com

PST - developers of E-Prime® 3.0, the world leading stimulus presentation software. E-Prime and Chronos® deliver millisecond-accurate stimulus presentation, responses, and sound output. PST also manufactures fMRI hardware solutions - Celeritas® Fiber Optic Response System, Hyperion® MRI Digital Projection System, and an MRI Simulator with MoTrak® for head motion tracking.

Resonance Technology, Inc.

Booth #15 & 16
United States
Web: http://www.mrivideo.com/
818-882-1997
Email: sales@mrivideo.com

Resonance Technology, Inc. has been the recognized leader in cutting-edge MRI compatible audio-video systems. The company was founded in 1988 by Mokhtar Ziarati, an Electrical Engineer specializing in ct and MRI, with the goal of eliminating the claustrophobia and discomfort patients often experience during MRI procedures. In addition to our full line of MRI compatible patient comfort devices, Resonance Technology, Inc. offers our second generation of the first and only truly stereoscopic, SXGA Virtual Reality Display for functional MRI on the market. With unmatched clarity and versatility, VisuaStim SXGA is the perfect choice in visual stimulation displays for fMRI studies. Its compact, eyeglass-like design allows it to be used in all standard Headcoils. The crisp, dual 1280 x 1024 x 3 pixel resolution displays (display contrast ratio;l0,000:1) affords brilliant color and crystal-clear picture quality, free of color aberration or pixel dropout. Input from your PC allows real time 3D objects to be displayed to your subjects. The optional MREye eyetracking module adds even more versatility for your critical studies, allowing for a complete input/output device within the bore of the magnet. A standalone version of our eyetracking system is available for the PC platform, featuring great accuracy and easy set up. at a low cost (about 1/3 the cost of any comparable systems). This is the only fMRI eyetracker on the market that includes a built-in camera and operates entirely inside the headcoil. An optional reflective mirror is available for viewing any external visual paradigm presentation. We also have a full line of Audio and Video Systems for patient comfort applications including the new widescreen Cinema Vision.

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514-284-3888
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Email: contact@soterixmedical.com

Soterix Medical is the leader in Noninvasive Electrical Brain Stimulation and introduced High Definition-transcranial Electrical Stimulation (HD-tES), which is the only targeted sub-threshold Neuromodulation technology. HD-tES allows coupling with research-grade monitoring technologies like EEG, MEG, fNIRS, etc. Soterix Medical offers a range of innovative solutions from Telemedicine, Spinal Cord to Animal Stimulation.

SR Research
Booth #42
Canada
Web: www.sr-research.com
Email: greg.perryman@sr-research.com

VPixx Technologies
Booth #30
Canada
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514-328-7499
Email: sales@vpixx.com

VPixx Technologies develops specialized visual displays and data acquisition systems for vision and neuroscience research. VPixx will demonstrate its PROPixx DLP projector, now running up to 1440Hz. MRI installations can use the PROPixx with a full line of fiber-optic response boxes and audio stimulator. VPixx will also be demonstrating the TRACKPixx, our innovative 2kHz MRI compatible eye tracker.

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POSTER LAYOUT

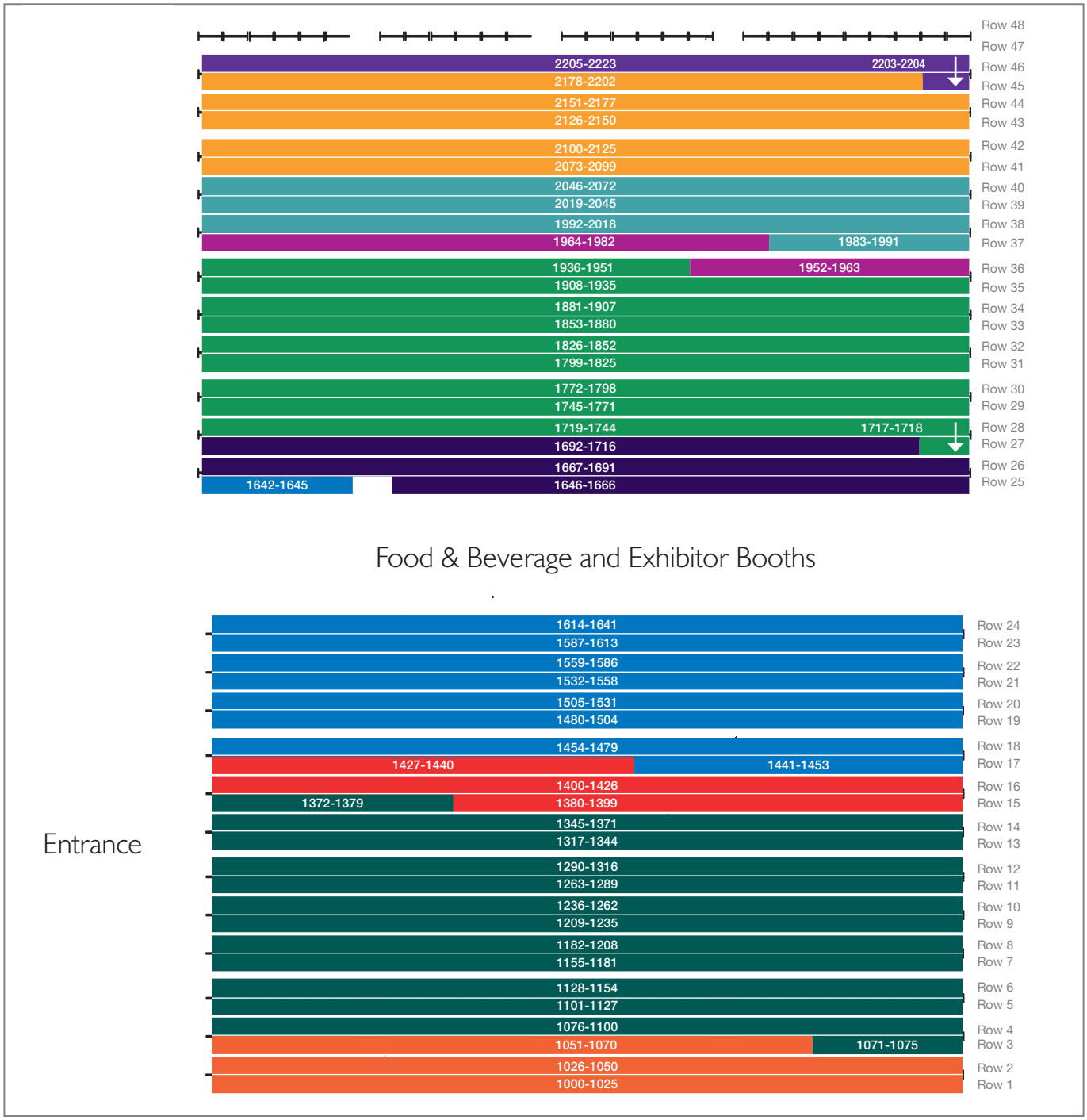
Please note the map is not to scale and is subject to minor changes as posters are withdrawn.

2017 OHBM Poster Listing Map

Monday (even) and Tuesday (odd)
1000-2223

Poster Category Key

- Brain Stimulation Methods: 1000-1070
- Disorders of the Nervous System: 1071-1379
- Emotion and Motivation: 1380-1440
- Imaging Methods: 1441-1645
- Informatics: 1646-1718
- Modeling and Analysis Methods: 1719-1951
- Motor Behavior: 1952-1982
- Neruoanatomy: 1983-2072
- Perception and Attention: 2073-2202
- Physiology, Metabolism and Neurotransmission: 2203-2223



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2017 OHBM Poster Listing Map

Wednesday (even) and Thursday (odd)

3000-4261

Poster Category Key

- Disorders of the Nervous System: 3000-3291
- Genetics: 3292-3325
- Higher Cognitive Function: 3326-3429
- Imaging Methods: 3430-3613
- Language: 3614-3689
- Learning and Memory: 3690-3776
- Lifespan Development: 3777-3891
- Modeling and Analysis Methods: 3892-4196
- Social Neuroscience: 4197-4261

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