# SIXTH ANNUAL WORLD COURSE ON BRAIN MAPPING

## A WORLDWIDE INTER-DISCIPLINARY CONFERENCE

### FRIDAY 1 APRIL - SUNDAY 3 APRIL 2022



## FULL PROGRAM

www.IamBrain.org

# THE 2022 SIXTH ANNUAL BRAIN MAPPING CONFERENCE

Dear Colleagues

**Brief Course History** - In the last several years we started an effort to bridge the gap between surgical brain mapping and cognitive neuroscience, bringing together specialisms including fibre dissection, functional neuroimaging, neuropsychology, speech and language, motor neuroscience, computer science and AI, and clinical and cognitive neurology.

In March 2021, we were planning to hold a three-day World Course in London, but this coincided with efforts to emerge from a global pandemic that still, takes a heavy toll in human lives, healthcare systems, global and national economies, and personal lifestyles. We have no doubt that you are all contributing to support your Hospital teams and your colleagues outside your specialty, overcoming an unprecedented crisis.

As we have not yet emerged from these trying times, we are conducting our seventh annual course online but entirely live. We elected to run this course over a weekend, accommodating transitions of world time zones, and allowing some time for our delegates to rest for a very intellectually demanding timetable.

**International Association for Mapping the Brain (IamBrain.org)** - In 2020, we established a truly multidisciplinary society, continuing the efforts of interspecialty collaboration in understanding the many facets of brain function from different angles and perspectives. We are thrilled to welcome some of the most well known neuroscientists in the world, pillars of current thinking, hoping that this newly established, and very special, community, will inspire further collaborations and research efforts to better understand the many, still hidden, brain functions.

**Worldwide interdisciplinary conference, 1-3 April 2022** - Our video symposium, despite its online platform, adheres strictly to the same principles of high educational content, professionalism, originality, and attention to detail, that our Course delegates expect from us. We are committed in delivering the same high standards, in every detail possible, during this course.

To that end, we also expect our online delegates to participate from start to finish, taking only the allocated breaks, and contributing within our online community with the same spirit of collegiality.

We extend our warm welcome for an unprecedented event!

**Organising Committee, IamBrain.org**

**KEY TERMS AND CONDITIONS** (17 DECEMBER 2021)
**By participating in this video symposium you confirm that:**
1. You are a qualified healthcare professional or an academic researcher with interest in brain mapping, brain research or treating brain tumour patients
2. The aim of your participation is to enhance your personal education and personal studies
3. You will not pass or transfer your allocated, individualised connection link to another person.
4. **You will not record, store, disseminate, post online or publish any of the material, regardless of duration, including videos, presentations slides, photographs, screen-shots, or voice recordings for any personal or public use, either currently or in the future.**
5. For full terms and conditions please visit the website **www.IamBrain.org**

## PROGRAM AT A GLANCE

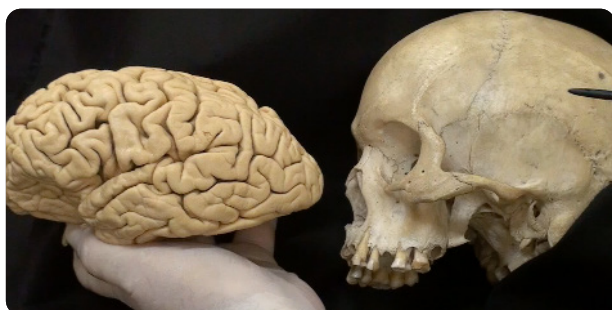| FRIDAY | | INTERACTIVE ANATOMY, IMAGING & TRACTOGRAPHY WORKSHOPS |
| --- | --- | --- |
| SATURDAY | | MASTERCLASS ON LANGUAGE, MOVEMENT & PERCEPTION |
| SUNDAY | | ORAL PRESENTATIONS & MASTERCLASS ON PARCELLATION, MAPPING, ATTENTION & EMOTION |

**Guilherme Ribas**, *University of Sao Paolo* (left) and **Juan Fernando Miranda**, *Stanford University* will run interactive seminars on cortical and subcortical brain anatomy.

## FRIDAY 1 APRIL 2022 ANATOMY WORKSHOPS
### PART I - INTERACTIVE WORKSHOPS OF CORTICAL & WHITE MATTER ANATOMY

| Time | Activity/Speaker | | Theme |
|---|---|---|---|
| 2:00-2:20 pm London 9:00-9:20 am New York | **Talk** **George Samandouras** Queen Square, London | | **Introduction to the virtual anatomy Workshops** |
| 2:20-2:50 pm London 9:20-9:50 New York | **Video demonstration** **Guilherme Ribas**, Sao Paulo, Brazil **Discussion** (10 minutes) | | **Applied cortical anatomy in relation to language, movement & cognition** |
| 2:50-3:20 pm London 9:50-10:20 am New York | **Video demonstration** **Juan Fernandez-Miranda** Stanford, Palo Alto **Discussion** (10 minutes) | | **White matter fibre dissection of the superior longitudinal fasciculus (SLF)** |
| 3:20-3:50 pm London 10:20-10:50 New York | **Video demonstration** **Juan Fernandez-Miranda** Stanford, Palo Alto **Discussion** (10 minutes) | | **White matter fibre dissection of the arcuate fasciculus (AF)** |
| 3:50-4:20 pm London 10:50-11:20 am New York | **Video demonstration** **Juan Fernandez-Miranda** Stanford, Palo Alto **Discussion** (10 minutes) | | **White matter fibre dissection of the external and internal capsules** |
| 4:20-4:50 pm London 11:20-11:50 am New York | **Video demonstration** **Chris Koutsarnakis** Athens University **Discussion** (10 minutes) | | **White matter fibre dissection of the inferior fronto-occipital fasciculus (IFOF)** |
| 4:50-5:20 pm London 11:50-12:20 pm New York | **Video demonstration** **Chris Koutsarnakis** Athens University **Discussion** (10 minutes) | | **White matter fibre dissection of the Middle longitudinal fasciculus (MLF)** |
| 5:20-5:50 pm London 12:20-12:50 pm New York | **Quick coffee break** | | |

# FRIDAY 1 APRIL 2022 TRACTOGRAPHY WORKSHOPS
## PART II - INTERACTIVE EXERCISES OF TRACTOGRAPHIC DISSECTION & SOFTWARE

| Time | Activity/Speaker | | Theme |
|------|------------------|---|-------|
| 5:50-6:00 pm London 12:50-1:00 pm New York | **Talk** George Samandouras, Queen Square, London | | **Introduction to tractography workshops** |
| 6:00-7:00 London 1:00-2:00 pm New York | **Interactive brain atlasing exercises** **Katrin Amunts** and **Timo Dickscheid**, University of Düsseldorf and Cecile and Oskar Vogt Institute for Brain Research, Düsseldorf | | **Step-by-step use of the HBP's multilevel human brain atlas** **Pre-workshop requirements:** Please familiarise yourself with the multilevel human brain atlas software here: https://ebrains.eu/service/human-brain-atlas/ |
| 7:00-8:30 pm London 2:00-3:30 pm New York | **Interactive tractography exercises** **Anastasia Yendiki**, Harvard University, Boston | | **Step-by-step analysis of diffusion MRI data to extract whole-brain tractography streamlines** **Pre-workshop requirements:** 1. Please **download** trackvis at http://www.trackvis.org 2. Please **activate** the software and request a **serial number**. 3. Please **download** a dataset here http://www.bcblab.com/BCB/MSc_files/Tractography.zip (simplified for computing purposes but you also can download a full version here https://www.dropbox.com/s/nud2dt14z8vo0sk/P02_1mm.trk?dl=0) |
| 8:30-9:00 pm London 3:30-4:00 pm New York | **Quick coffee break** | | |
| 9:00-10:30 pm London 4:00-5:30 pm New York | **Interactive tractography exercises** **Michel Thiebaut de Schotten**, Sorbonne Universities & University of Bordeaux **Stephanie Forkel**, Sorbonne Universities, Paris & University of Bordeaux | | **Tractography of superior longitudinal (SLF) and arcuate (AF) fasciculi** **Pre-workshop requirements:** 1. Please **download** trackvis at http://www.trackvis.org 2. Please **activate** the software and request a **serial number**. 3. Please **download** a dataset here http://www.bcblab.com/BCB/MSc_files/Tractography.zip (simplified for computing purposes but you also can download a full version here https://www.dropbox.com/s/nud2dt14z8vo0sk/P02_1mm.trk?dl=0) 4. Please **familiarise yourself** with online training on the corpus callosum dissection (https://youtu.be/CojNe42RUjE) to facilitate focusing on advanced dissections during workshop. |

| Time | Activity/Speaker | | Theme |
| --- | --- | --- | --- |
| 10:30 pm - 00 am London 5:30-7:00 pm New York | **Interactive Human Connectome Project exercises**<br><br>**David Van Essen** & **Jennifer Elam** Washington University in St Louis |  | **Working with HCP and HCP-style data for high-quality analyses of fMRI and diffusion imaging data**<br><br>**Pre-workshop requirements**:<br><br>1. **Download** Connectome Workbench software: https://www.humanconnectome.org/software/get-connectome-workbench<br>2. **Accept** HCP Data Use Terms: https://db.humanconnectome.org/app/template/Login.vm<br>3. **Download** and go through the following tutorial dataset and instructions [TBD] |
| 00:00 am London 7:00 pm New York | **End of day 1** |  | |
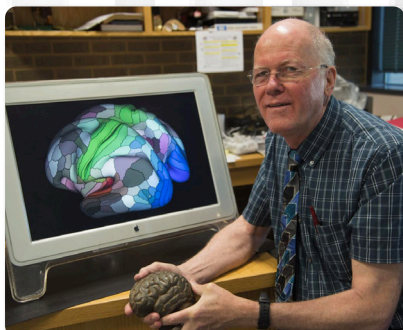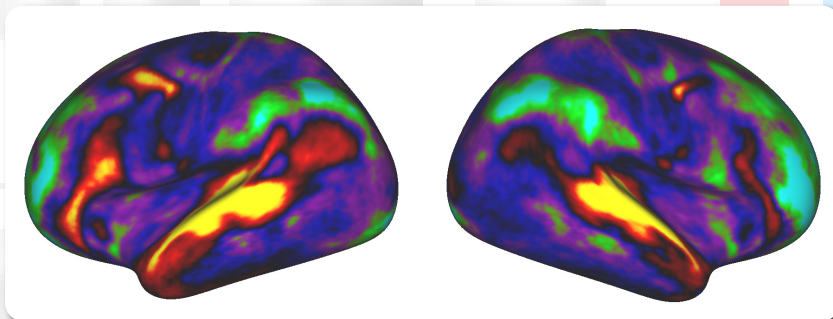








**David van Essen**, the architect of the Human Connectome Project (HCP), and **Jennifer Elam**, Scientific Outreach, HCP, both at Washington University School of Medicine, will demonstrate interactivelly how to work with HCP and HCP-style data for analyses of fMRI and DTI data.

Register here
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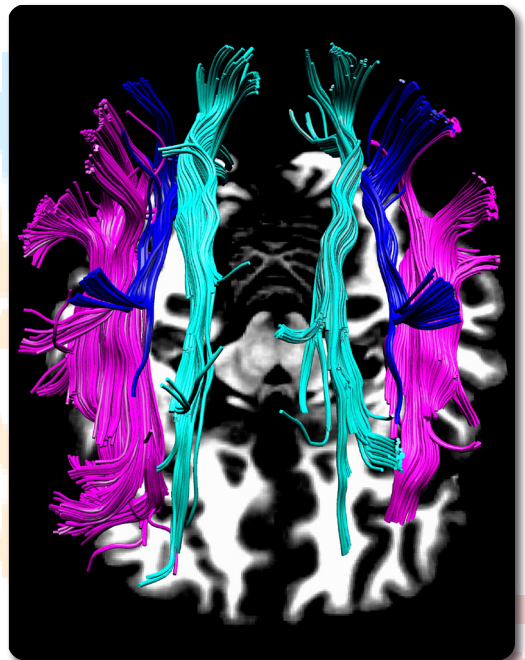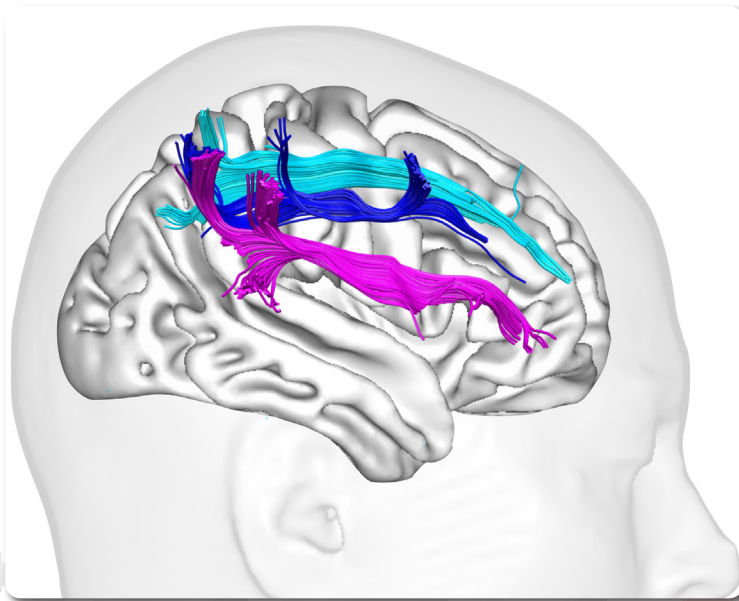
**Michel Thiebaut de Schotten**, Editor-in-Chief of *Brain Structure and Function*, and **Stephanie Forkel**, both at *Sorbonne Universities & University of Bordeaux*, will run an interactive workshop with tractographic dissections of the superior longitudinal and arcuate fasciculi.



HCP_MMP_1.0 Parcellation
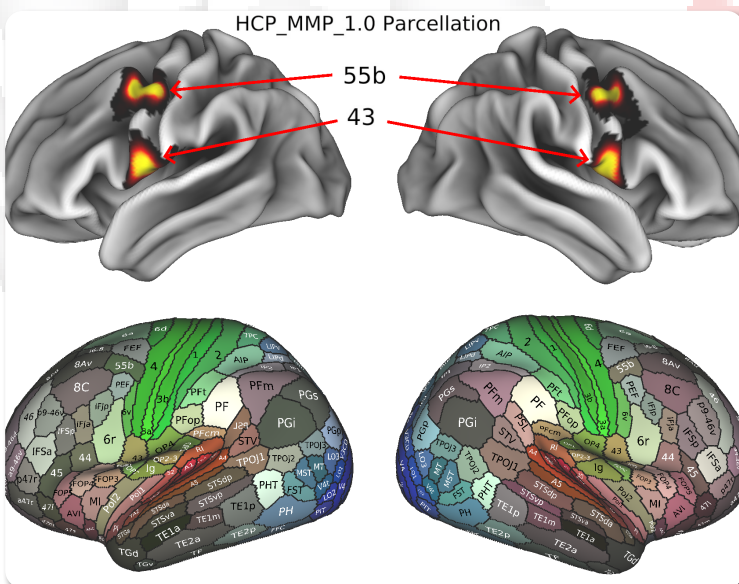
From the workshop of **David van Essen**, and **Jennifer Elam**, on analyses of HCP and HCP-style data (Courtesy M. F. Glasser & D. C. Van Essen)



**Anastasia Yendiki**, *Harvard University* (above) and **Katrin Amunts**, *University of Düsseldorf* (below) will be running interactive workshops on tractography and brain atlasing, respectively.



Register here
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## SATURDAY 2 APRIL 2022 MASTERCLASS
### PART I - LANGUAGE

| Time | Activity/Speaker | | Theme |
|------|------------------|---|-------|
| 2:00-2:30 pm London 9:00-9:30 am New York | **Masterclass** **George Samandouras**, Queen Square, London, UK **Discussion** (10 minutes) |  | **New models of clinicians/scientists collaboration in personalised brain mapping** |

### LANGUAGE NETWORKS

| Time | Activity/Speaker | | Theme |
|------|------------------|---|-------|
| 2:30-3:00 pm London 9:30-10:00 am New York | **Masterclass** **Gregory Hickok** University of California, Irving, USA **Discussion** (10 minutes) |  | **The dual-stream language model 15 years later** |
| 3:00-3:30 pm London 10:00-10:30 am New York | **Masterclass** **Patricia Kuhl** University of Washington Seattle, USA **Discussion** (10 minutes) |  | **Language wiring in the developing nervous system** |
| 3:30:4:00 pm London 10:30-11:00 am New York | **Masterclass** **Nina Dronkers** University of California, Berkeley, USA **Discussion** (10 minutes) |  | **Broca revisited; MRI findings of his original patients** |
| 4:00-4:30 pm London 11:00-11:30 am New York | **Masterclass** **Anthony Dick** Florida International University, Miami, USA **Discussion** (10 minutes) |  | **Broca and Wernicke are dead, or moving past the classic models of language** |
| 4:30-5:00 pm London 11:30 am-12:00 pm New York | **ROUND TABLE** |  | **LANGUAGE NETWORKS** |
| 5:00-5:30 pm London 12:00-12:30 pm New York | **Quick coffee break** |  | |
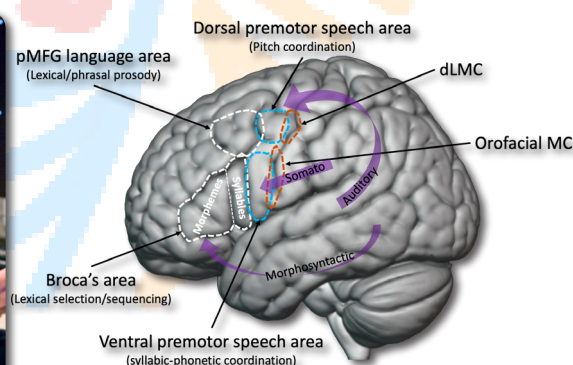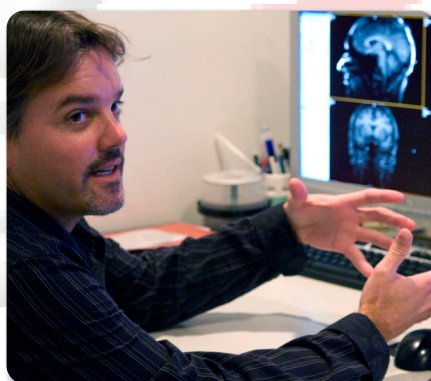


**Nina Dronke**rs, *University of California, Berkeley*, holding the brain of one of the most famous neurological patients of the 19th century, Louis Victor Leborgne, responsible for the naming of Broca's area. **Gregory Hickok**, *University of California, Irving*, has introduced the dual stream language model and will be discussing language neural networks (right).

## SATURDAY 2 APRIL 2022 MASTERCLASS
### PART II - SURGICAL LANGUAGE MAPS

| Time | Activity/Speaker | | Theme |
|------|------------------|---|-------|
| | **ELECTRICAL STIMULATION-GENERATED (MULTI)LANGUAGE MAPS** | | |
| 5:30-6:00 pm London 12:30-1:00 pm New York | **Masterclass** **Mitchel Berger** University of California in San Francisco, USA **Discussion** (10 minutes) | | **Direct electrical stimulation-derived language maps; 30 year data** |
| 6:00-6:30 pm London 1:00-1:30 pm New York | **Masterclass** **Jinsong Wu** Fudan University, Shanghai, China **Discussion** (10 minutes) | | **Language centres for English and Chinese following direct electrical stimulation during awake surgery** |
| 6:30-7:00 pm London 1:30-2:00 pm New York | **Masterclass** **Edward Chang** University of California in San Francisco, USA **Discussion** (10 minutes) | | **Neuroprosthesis for decoding speech in a paralyzed anarthric patients** |
| 7:00-7:30 pm London 2:00-2:30 pm New York | **ROUND TABLE** | | **STIMULATION-GENERATED (MULTI)LANGUAGE MAPS** |
| 7:30-8:00 pm London 2:20-3:00 pm New York | **Quick coffee break** | | |
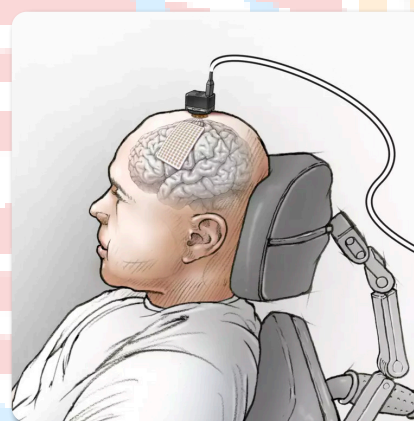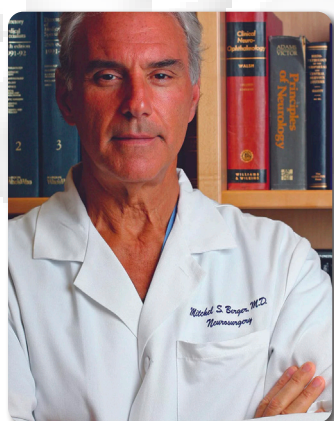






**Mitchel Berger**, (left) *UCSF*, a pioneer in awake brain mapping with the biggest experience in mapping patients. **Edward Chang**, (middle), *UCSF*, will be discussing his groundbreaking work on neuroprosthesis and language decoding (right)

**Jinsong Wu**, (right) *Fudan University, Shanghai*, will be discussing results of direct electrical stimulation for English and Chinese language during awake surgery for brain tumours.





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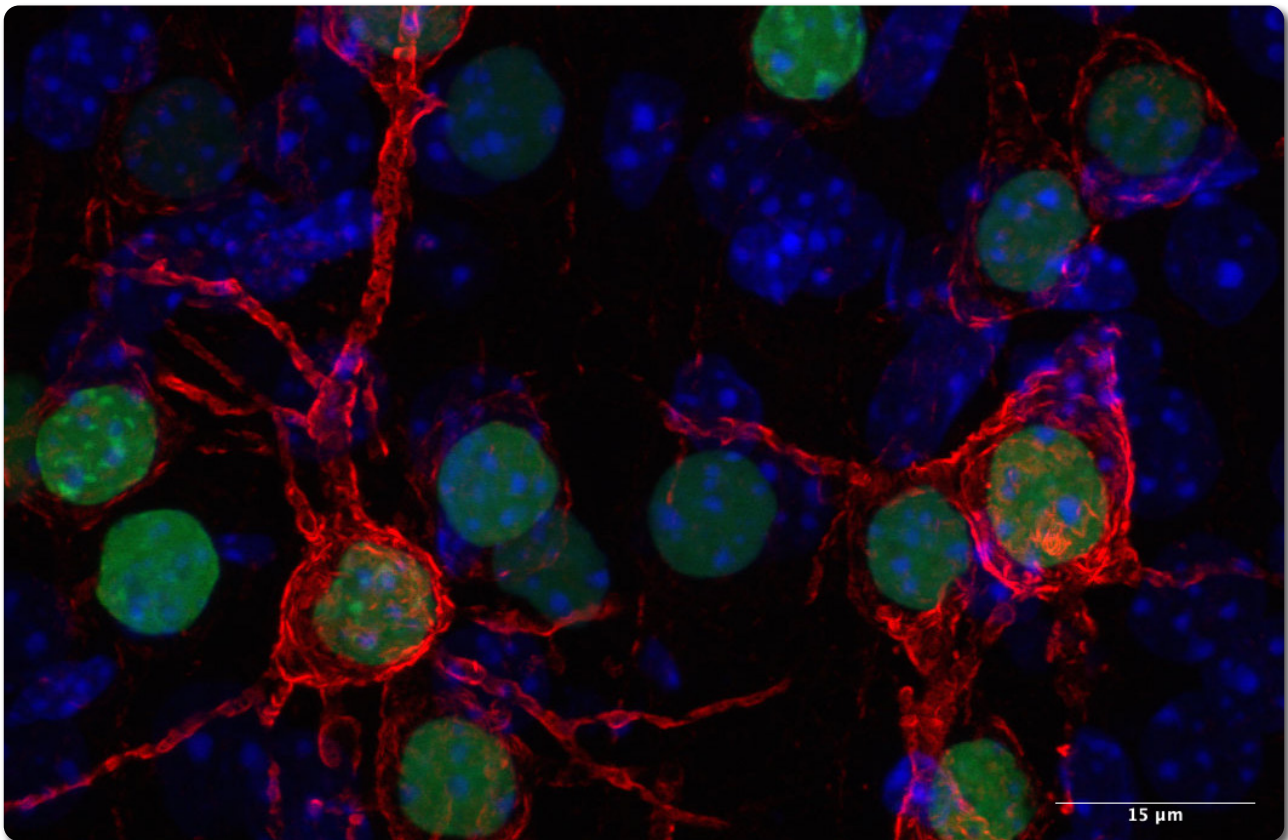
High resolution image of L2/3 cortical pyramidal neurons expressing a soma-targeted optogenetic protein (red) and nuclear GFP (green). Blue is DAPI which stains DNA. Courtesy of **Hillel Adesnik**, Department of Molecular and Cell Biology and HWNI, *University of California, Berkeley*, from his Masterclass "Perception and sensory coding".
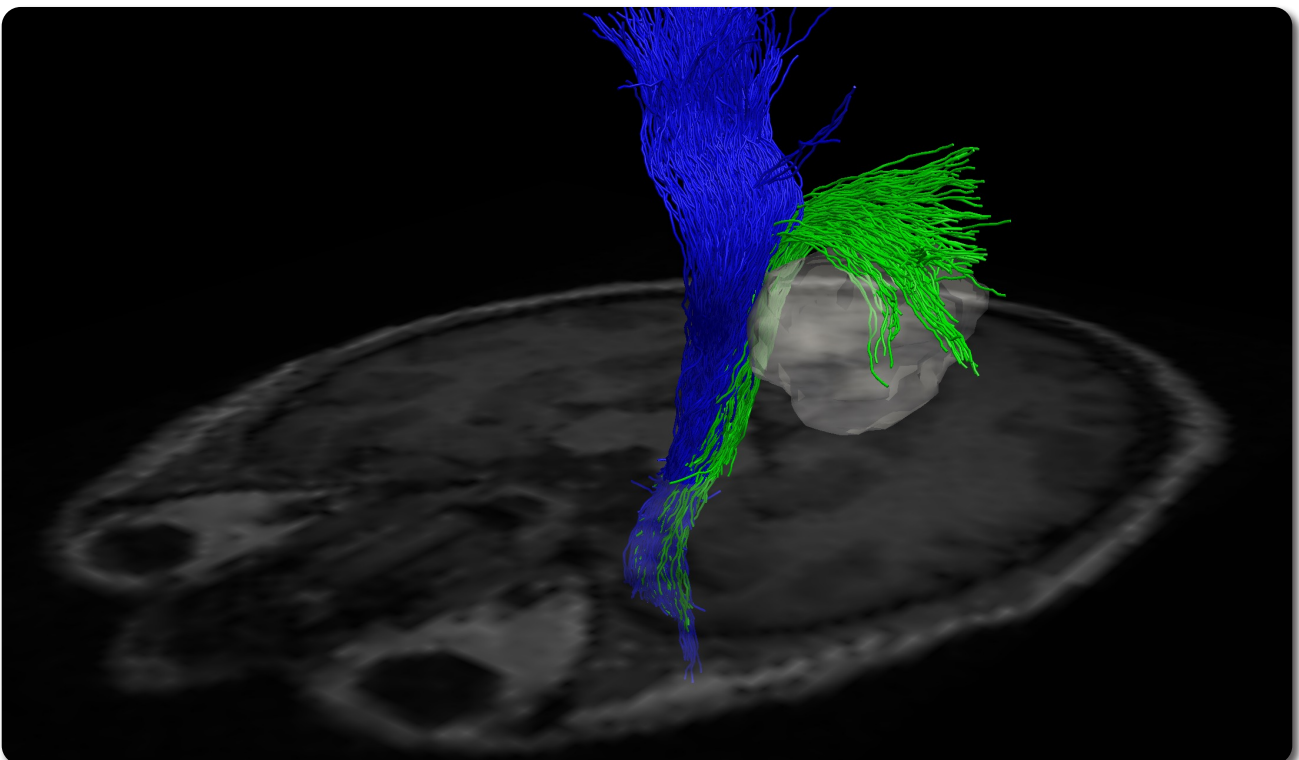


Probabilistic whole brain tractography, HARDI (spherical deconvolution), 73 direction multishell acquisition (b700, b2000). Corticospinal tract, blue; corticobulbar track, green. Courtesy of **Gabriella Cerri** and **Lorenzo Bello**, *University of Milan*, from their Masterclass on cortical organisation and electrical stimulation of the motor system.

| Time | Activity/Speaker | | Theme |
|------|------------------|---|-------|
| | **MOVEMENT AND MOTOR AND SENSORY NETWORKS** | | |
| 8:00-8:30 pm London 3:00-3:30 pm New York | **Masterclass** **Roger Lemon** University College London, UK **Discussion** (10 minutes) | | **Organisation and connectivity of motor and premotor cortices** |
| 8:30-9:00 pm London 3:30-4:00 pm New York | **Masterclass** **Gabriella Cerri** University of Milan, Italy **Discussion** (10 minutes) | | **Functional organization of the primary motor cortex in humans** |
| 9:00-9:30 pm London 4:00-4:30 pm New York | **Masterclass** **Lorenzo Bello** University of Milan, Italy **Discussion** (10 minutes) | | **Direct electrical stimulation of pre-motor cortices (pre-SMA, SMA, ventral and dorsal premotor)** |
| 9:30-10:00 pm London 4:30-5:00 pm New York | **Masterclass** **Stephen H Scott** Queens University, Kingston, Canada | | **Cortical control of movement** |
| 10:00-10:30 pm London 5:00-5:30 pm New York | **Masterclass** **Hillel Adesnik** University of California, Berkeley, USA | | **Perception and sensory coding** |
| 10:30-11:00 pm London 5:30-6:00 pm New York | **ROUND TABLE** | | **MOVEMENT AND MOTOR AND SENSORY NETWORKS** |
| 11:00 pm London 6:00 pm New York | **End of day 2** | | |
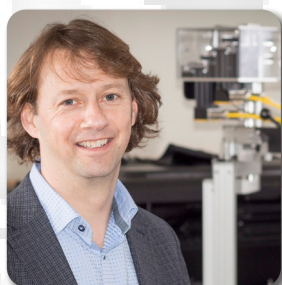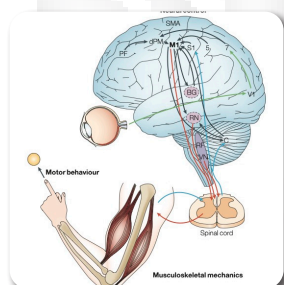
From the Masterclass of **Stephen Scott** on cortical control of movement (Image Courtesy of S Scott, Nature Reviews Neuroscience)
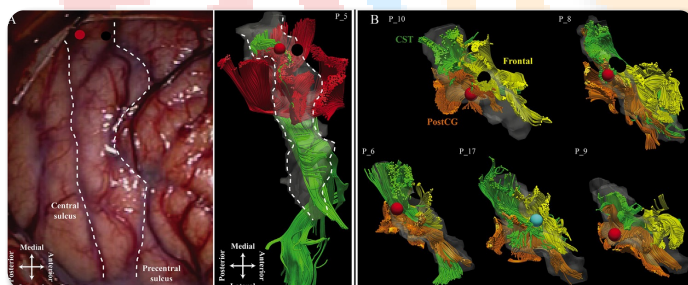
From the Masterclass of **Gabriella Cerri**, and **Lorenzo Bello**, on organisation of the motor cortex and its electrical stimulation
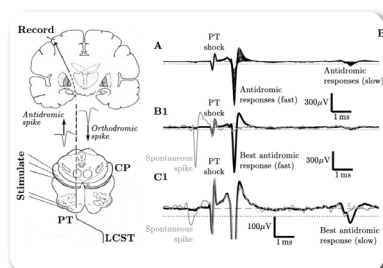
From the Masterclass of **Roger Lemon**, UCL, on organisation and connectivity of motor and premotor cortices

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## PRESENTATIONS OF ACCEPTED ABSTRACTS IN LANGUAGE, MOVEMENT, TRACTOGRAPHY, ANATOMY AND MAPPING

| Time | Activity/Speaker | Theme |
|------|------------------|-------|
| 2:00-4:00 pm London 9:00-11:00 am New York | Oral presentations of accepted abstracts | |
| 4:00-4:30 pm London 11:00-11:30 am New York | Quick coffee break | |
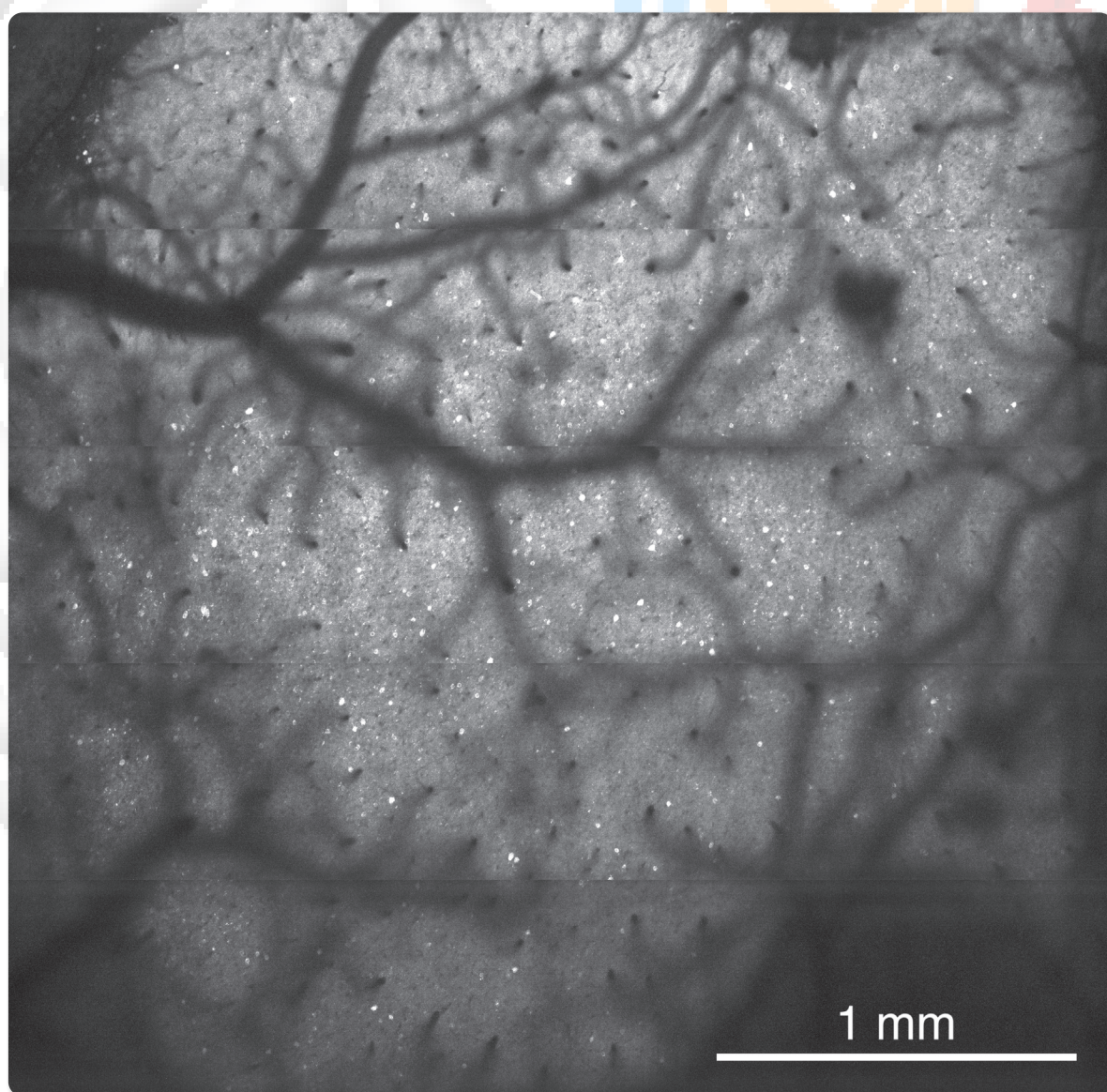


A two photon mesoscale image of a mouse expressing GCaMP6s in cortical excitatory neu-rons. Courtesy of **Hillel Adesnik**, University of California, Berkeley.

# SUNDAY 3 APRIL 2022 MASTERCLASS
## PART II - PARCELLATION & ATLASING

| Time | Activity/Speaker | | Theme |
|------|------------------|---|-------|
| | **PARCELLATION AND NETWORKS** | | |
| 4:30-5:00 pm London 11:30 am-12:00 pm New York | **Masterclass** **David van Essen** University of Washington, St Louis, USA **Discussion** (10 minutes) | | **Multimodal parcellation models of the cerebral cortex** |
| 5:00-5:30 pm London 12:00-12:30 pm New York | **Masterclass** **Cathy Price** University College London, UK **Discussion** (10 minutes) | | **Lesion-generated fMRI language cortical maps** |
| 5:30-6:00 pm London 12:30-1:00 pm New York | **Masterclass** **Gregory Hickok** University of California, Irving, USA **Discussion** (10 minutes) | | **Beyond Broca: Neural Architecture and Evolution of a Dual Motor Speech Coordination System** |
| 6:00-7:00 pm London 1:00-2:00 pm New York | **Masterclass** **Jeremy Schmahmann** Harvard University, Boston, USA **Discussion** (10 minutes) | | **Atlas of fibre pathways of the brain; a power review** |
| 7:00-7:30 pm London 2:00-2:30 pm New York | **Quick Coffee break** | | |

From the Masterclass of **Cathy Price**, *Wellcome Centre for Neuroimaging, London*, on lesion-generated fMRI cortical maps.

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From the Masterclass of **Jeremy Schmahmann**, *Harvard University*, on fibre pathways of the brain using autoradiography
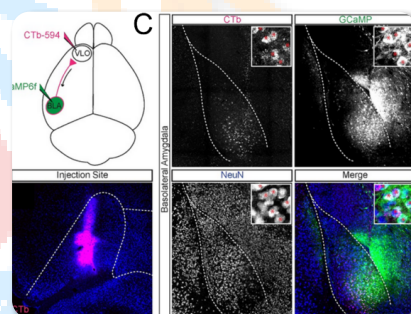
From the Masterclass of **C. Daniel Salzman** *Columbia University*, on neural connectivity of emotion. Image demonstrates local expression of GCaMP6f in the basolateral amygdala, combined with retrograde labeling of amygdala neurons that project to ventro-lateral orbitofrontal cortex.

## SUNDAY 3 APRIL 2022 MASTERCLASS
### PART III - ATTENTION AND EMOTION

| Time | Activity/Speaker | | Theme |
|---|---|---|---|
| | | **MAPPING ATTENTION AND HUMAN EMOTION** | |
| 7:30-8:00 pm London 2:30-3:00 pm New York | **Masterclass** **C. Daniel Salzman** Columbia University, New York, USA **Discussion** (10 minutes) |  | The neural connectivity of emotion |
| 8:00-8:30 pm London 3:00-3:30 pm New York | **Masterclass** **Alexandra Golby** Harvard University, Boston, USA **Discussion** (10 minutes) |  | Multi-modal approaches to single subject mapping of emotional networks |
| 8:30-9:00 pm London 3:30-4:00 pm New York | **Masterclass** **Fion Bremner** National Hospital, London, UK **Discussion** (10 minutes) |  | The connectivity of visual pathways |
| 9:00-9:30 pm London 4:00-4:30 pm New York | **IamBrain.org 2022 Annual AWARD** |  | **Awarded to the best original work & presentation of the year** |
| 9:30-10:00 pm London 4:30-5:00 pm New York | **IamBrain.org Current efforts and future directions** |  | **Faculty & Delegates** |
| 10:00-10:30 pm London 5:00-5:30 pm New York | **Virtual closure with real drinks with Faculty** |  | |
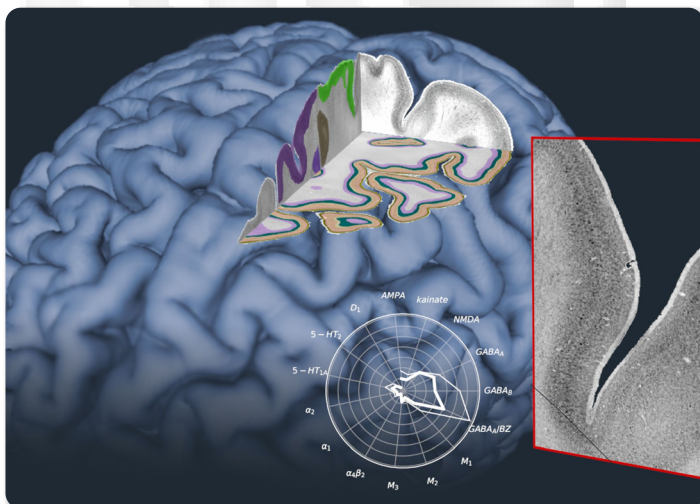


**Katrin Amunts**, and **Timo Dickscheid** *University of Düsseldorf*, will be running an interactive workshop on multimodal brain maps.
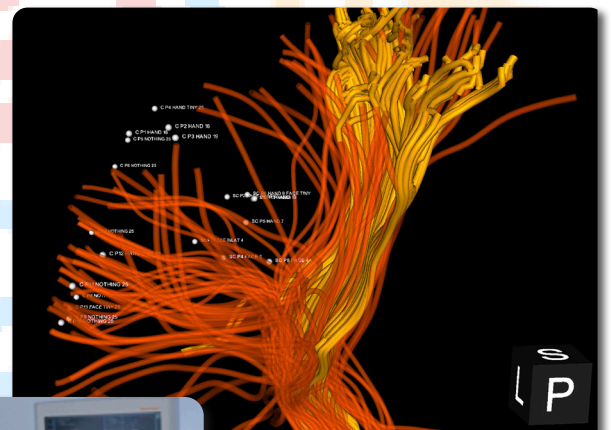




**Alexandra Golby**, *Harvard University*, will be discussing mapping of emotional networks.