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Abstract:	This Deliverable reports on the creation and running of the European Institute for Theoretical Neuroscience (EITN), which was established as part of the HBP's Theoretical Neuroscience activities (SP4). Since the EITN inauguration in March 2014, several workshops and brainstorm sessions have been held and more are planned for the coming months. Two postdocs are now in residence at the EITN.		
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1. Introduction

1.1 The Human Brain Project (HBP)

The Human Brain Project (HBP) is a major international scientific research project, involving over 100 academic and corporate entities in more than 20 countries. Funded by the European Commission (EC), the ten-year, EUR 1 billion Project was launched in 2013 with the goal "to build a completely new ICT infrastructure for neuroscience, and for brain-related research in medicine and computing, catalysing a global collaborative effort to understand the human brain and its diseases and ultimately to emulate its computational capabilities."

The fields of neuroscience, medicine and information technology each have important roles to play in addressing this challenge, but the knowledge and data that each is generating have been very fragmented. The HBP is driving integration of these different contributions.

During the Ramp-Up Phase, the HBP will collect strategic data, develop theoretical frameworks, and perform technical work necessary for the development of six Information and Communication Technology (ICT) Platforms during the Operational Phase. The ICT Platforms, offering services to neuroscientists, clinical researchers and technology developers, comprise Neuroinformatics (a data repository, including brain atlases); Brain Simulation (building ICT models and simulations of brains and brain components); Medical Informatics (bringing together information on brain diseases); Neuromorphic Computing (ICT that mimics the functioning of the brain); and Neurorobotics (allowing testing of brain models and simulations in virtual environments). A High Performance Computing Platform will support these Platforms.



2. WP4.5: The European Institute for Theoretical Neuroscience (EITN)

2.1 WP4.5 The EITN: Overall Goals

WP4.5 was created to establish a European Institute for Theoretical Neuroscience (EITN), where theoreticians with different backgrounds can collaborate to develop new theories of brain function. One of the main objectives of the EITN is to bring new theoreticians and theoretical concepts to the HBP through a visitor programme and workshops. The EITN acts as an incubator of ideas and new theories to facilitate the realisation of HBP objectives.

Alain Destexhe, Subproject (SP) 4 Leader, is the EITN Scientific Director. Katherine Frégnac manages the Institute's budget, administration and communication.

2.2 WP4.5 The EITN: Main Achievements

2.2.1 Set-Up and Administration of the Institute (T4.5.1)

The EITN was created in March 2014. It was inaugurated with a "kick-off" workshop on 26 March, followed by a Director's Board meeting on 27 March. A hosting convention has been established between the CNRS-UNIC and the Fondation *Voir et Entendre* to settle the EITN in Paris until we find a permanent location - one of our long-term goals. A firm proposition for 200 m² of permanent space (planned for 2018) in the new Neuroscience Institute (NeuroPSI) of the Paris-Saclay University is already in place. This creates a possibility of making the EITN permanent, following the completion of the HBP.

Mathieu Galtier (a CNRS-UNIC postdoc), Marco Brigham (a CNRS-UNIC PhD student) and Gerald Hahn (a UPF postdoc) have joined the Institute. Several other postdocs are due to arrive in the coming weeks or months, including Bartosz Telenczuk (CNRS-UNIC) in October 2014, and Ulisse Ferrari (UPMC) in November 2014, Ausra Saudargiene (TUT) - dates not yet determined. Nathalie Garcia began work on 7 March 2014. She is the EITN administrative assistant in charge of all day-to-day relations with EITN scientists.

The EITN conference room comprises 65 seats, a video projector and a videoconference system. The EITN's first and last floors can hold up to 10 researchers at the same time, and include computers and white boards.

The website (<http://www.eitn.org>) was created not only for dissemination, but also to establish an event registration tool, as EITN events have a limited number of seats. The website will evolve as the content and development possibilities grow.

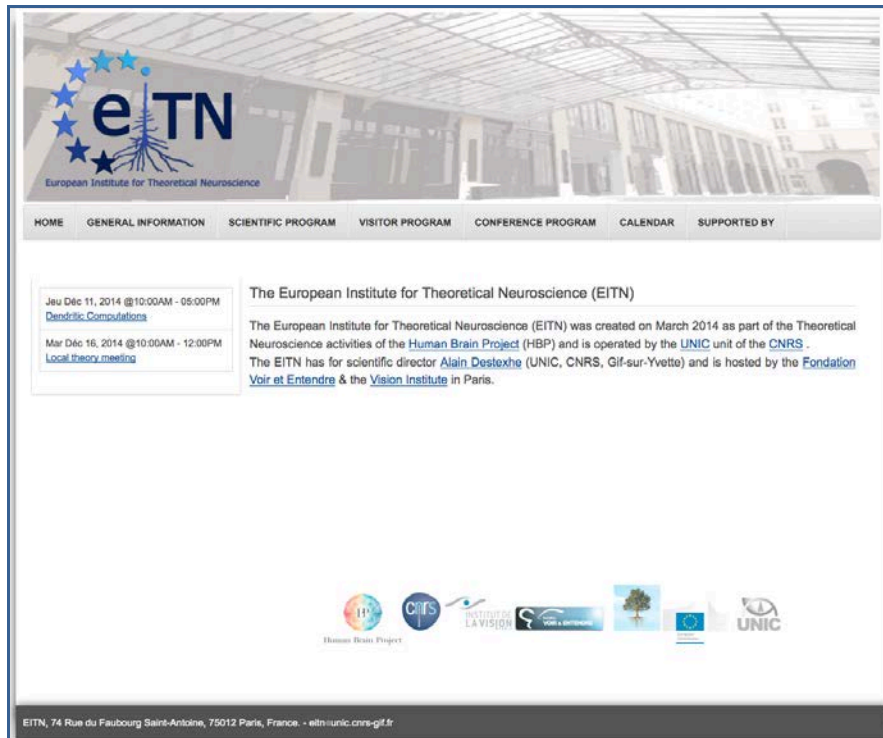


Figure 1: EITN website homepage



Figure 2: EITN website calendar page



2.2.2 Visitors and Workshop Programme (T4.5.2)

A general conference of SP4 was held during the kick-off workshop, "Bridging Scales." All Theoretical Neuroscience Partners were present at the conference, as well as the HBP Directors and many SP Leaders. The official institutional inauguration was held on 18 September 2014, and the guest speakers were Thomas Skordas (EC, director of the Flagship unit), Henry Markram (EPFL, HBP Coordinator), Bernard Poulain (CNRS Life-Sciences Directorate), Jose Sahel (Director of the Institut de la Vision) and Alain Destexhe (EITN Director).

Several workshops have taken place at the EITN, and its calendar is filling up. As of the writing of this Deliverable, 17 events have been organised, with total numbers of 58 speakers and 466 participants (Table 1). For a detailed list of events, please see Annex A: EITN Events. More workshops have been planned for 2015, and some are already advertised in the programme available on the EITN website.

Since its creation, the EITN has organised a number of brainstorming sessions involving a 5-10 Partners, as well as the workshops, which are larger and span two full days of meetings and discussions. These events catalysed scientific interactions within the HBP, and created horizontal interactions between different Subprojects. We have planned three inter-SP workshops for 2015. The EITN also facilitates interactions between the HBP and the community outside of the Project. For this reason, EITN workshops include a large component of invited speakers from outside the HBP. A visitor programme has been established to invite external researchers to spend time at the EITN, to participate in its activities, and to interact with the postdocs and HBP Partners present.

Number of Events	Number of Speakers	Number of Participants
17	58	466

Table 1: EITN Events

Within the last six months, we have welcomed more non-HBP visitors than HBP Partners, which suggests that there is a high demand for the EITN's services, even outside of the HBP (Figure 3).

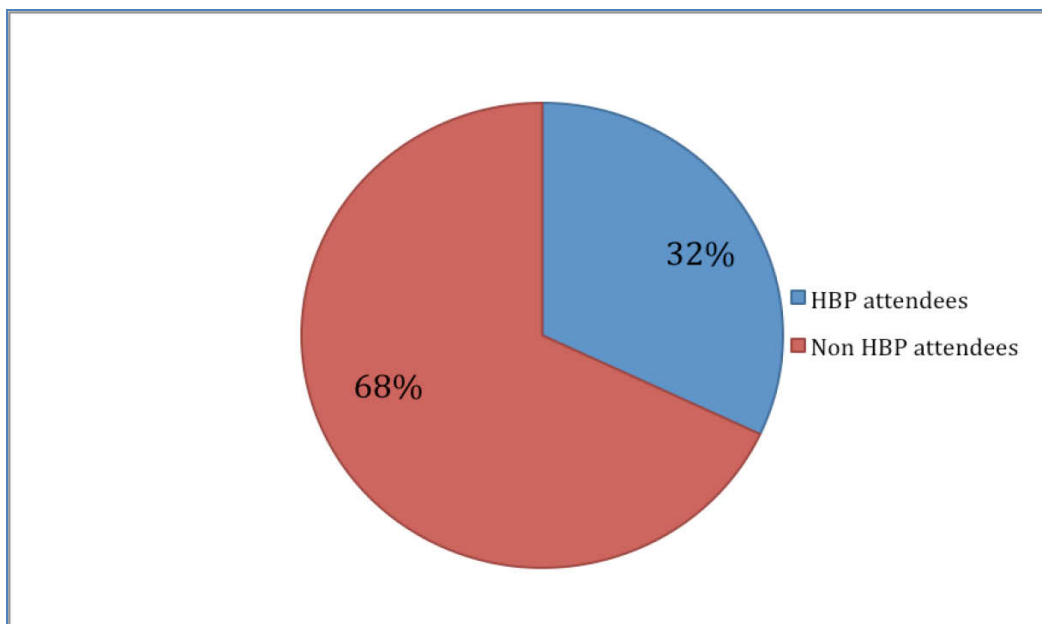


Figure 3: Event Attendance by HBP and Non-HBP Scientists, March-August 2014



The EITN also participated in a conference on the principles of brain computation, organised by TUGRAZ (P54) on 14-16 May 2014 in Fürberg, Austria. Experimental and theoretical neuroscientists and experts in neuromorphic circuits, including top researchers from outside the HBP, attended the meeting. This meeting created new links between experimentalists and theoreticians, and between researchers within and outside of the HBP.

All of the workshops organised in 2014 established concrete contacts and collaborations among HBP Partners, and also between HBP Partners and people outside of the HBP. In particular, the "Theory-Cognitive" (SP4-SP3) workshop led to a collaboration between the groups of Gustavo Deco (SP4) and Stanislas Dehaene (SP3) on analysing human functional imaging data using new model-based analysis tools. This collaboration, which was not included in the DoW, could potentially address several important points in SP3 relating the role of "resting state networks" in human cognition. Alain Destexhe's group is also collaborating with external researchers on the modelling of dendritic spikes, and how such events may help us understand the integrative properties of neurons. We hope that these researchers will apply to complementary projects.

Productive brainstorm meetings took place between HBP researchers and researchers from the MAGNETRODES project (FET Open). The recordings generated in this project help us understand and model magnetic brain signals. The fact that the HBP and the MAGNETRODES project share some partners (Destexhe, Parkkonen, Fries) will facilitate this collaboration.

2.2.3 Dissemination

An EITN website has been created at www.eitn.org and www.eitn.eu. Social media activity is being developed, including a Twitter account (@EITN_Paris) and a Facebook page (<https://www.facebook.com/pages/European-Institute-for-Theoretical-Neuroscience/652062091531430?fref=nf>).

Due to limited number of seats, we have setup a mandatory registration process for all of our workshops. Most have been advertised to people both inside and outside of the HBP community.

2.3 WP4.5 The EITN: Main Problems

During the creation of the EITN, a number of unforeseen problems had to be solved. A first and essential obstacle was to find 200m² of office space for free in Paris, as requested by the EC. This is because the initial budget for renting office space did not qualify as an eligible expense. Alain Destexhe consulted all Paris Institutions interested in theoretical neuroscience, and obtained five propositions for an EITN host, with office space ranging from 80m² to 220m². The choice of the Institut de la Vision (IDV) /Fondation Voir et Entendre was made based on the immediate availability of the office space, the high-quality scientific environment, and a convenient central location near Bastille area in Paris.

A second problem was that the necessary office and infrastructure equipment was also not an eligible expense. Fortunately, office furniture was available for free from one company that was moving out of the Institut de la Vision. CNRS-UNIC purchased the missing equipment using its own budget. A grant was obtained from the Paris-Saclay IDEX to set up the EITN with informatics and other office equipment.

A third unforeseen problem was the difficulty of organising last-minute workshops (this was unavoidable, as it was only known one month in advance that the start of the EITN was going to be in March). Prestigious speakers usually require invitations one year in advance; nevertheless, several prestigious speakers kindly agreed to come on short notice. The



percentage of speakers from respective SP4 Tasks is shown in Figure 4. T4.5.2 is devoted to speakers from outside of the HBP.

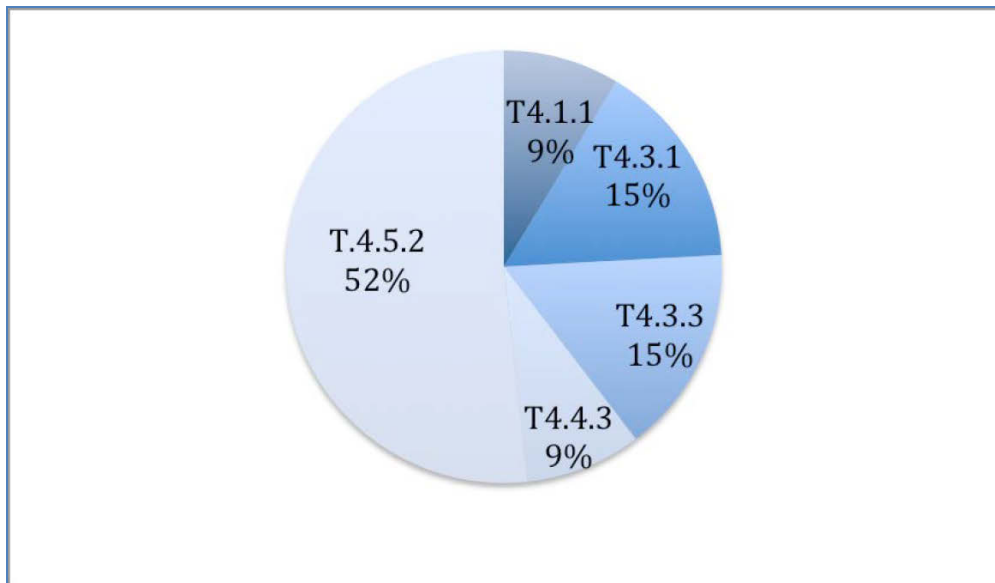


Figure 4: Percentage of Speakers from Different SP4 Tasks, March-August 2014

A fourth problem was finding appropriate administrative and scientific personnel in a relatively short time. Nevertheless, administrative personnel and postdocs were hired on time, as well as an IT assistant dedicated to informatics and website system management.

Finally, a main problem was that four postdocs were initially planned to reside in permanence at the EITN, and had been budgeted for accordingly. However, during the negotiations, EC Officers requested that these postdocs be affiliated with the four Work Package (WP) leaders of SP4, because the EITN did not exist and had no affiliation at the time. This shift led to only part-time resident postdocs at the EITN, since the hired postdocs must also spend time at their home institutions. This is detrimental to the scientific animation of the EITN. Since we now have an official affiliation, we propose to officially allocate four full-time postdoc positions to the EITN in the Operational Phase of the HBP.

2.4 WP4.5 The EITN: The Next 6 Months

2.4.1 Personnel

In the coming months, we will welcome four new postdocs: Ausra Saudargienne, Bartosz Telenzuck, Zahara Girones and Ulisse Ferrari. Thus, the EITN is leaving the setting-up phase and switching to a cruising mode, during which the results of preliminary activities will be analysed and appropriate actions will be taken to make improvements. Note that the postdoctoral researchers were selected based on their competence, and following interviews and letters of recommendation. Because each postdoc is supervised by a WP leader, the local procedures of each respective institution were followed.

2.4.2 Website

The EITN website www.eitn.org is in operation. A more interactive website version is under construction, and will be fully operational soon. Our aim is for visitors to find all information on the Institute and its events (both past and upcoming), and to make the navigation as user-friendly as possible while taking into account the technical limits. The development of webcast events is also being investigated.



2.4.3 Workshops

Most Tasks and Partners have started organising workshops at the EITN. For a list of upcoming events until June 2015. see Annex A: EITN Events.

It is important to note that several of the brainstorming sessions have indicated the need for larger workshops on the same topics; for example, the “dendritic computation” brainstorming session (six participants) in August 2014 led to the organisation of another two-day workshop (30-40 participants) in December 2014. During the SP3-SP4 meeting, we also realised the need for a further workshop on this topic, which is now being planned for the fall of 2015.

We will also organise horizontal workshops involving two or more SPs. For example, we plan to organise workshops with the Brain Simulation (SP6), Neuromorphic (SP9) and Neurorobotics (SP10) Subprojects in 2015. We believe that this emphasis on horizontal interactions is one of the EITN’s primary contributions to the HBP. By inviting external speakers, these events will facilitate interactions with the scientific community outside of the HBP—another main goal of the EITN. The EITN is now encouraging HBP members to organise short events (three days maximum) at our location to facilitate inter-SP interactions with theoretical components.

In addition to the workshops, conferences are being planned with other FET projects from [FET Open](#) and [FET Proactive](#). A conference is being planned with the BrainScales EC project in January 2015.

Date	Event Title
2014	
8-9 October	HBP-BrainScales meeting: Missing interactions in spike-based computation
27-28 November	Stochastic Neural computations workshop
11-12 December	Dendritic computations workshop
2015	
14-15 January	Confronting mean-field theories to measurements: a perspective from neuroscience

Table 2: Events Planned at the EITN in the Next Six Months

It is one of our goals that the exceptionally large local theoretical neuroscience community of Paris becomes involved in these activities. The EITN will encourage these theoreticians to organise a partnering project proposal to further support this collaboration. T4.5.2 will also organise a visitor program to which researchers from outside the HBP will be invited for extended periods of time (up to three months). The EITN is currently in discussion with two visitors for a long-term visit at the Institute in 2015.



3. Conclusion

The EITN is now reaching a cruising mode, with several workshops planned for the next year, some of which are already advertised in the programme available on the website. Since its creation, the EITN has organised a number of brainstorming sessions involving a 5-10 Partners, as well as several workshops. These events catalysed scientific interactions within the HBP, and created horizontal interactions between different Subprojects. EITN workshops include a large component of invited speakers from outside the HBP, and a visitor programme has also been established to invite external researchers to spend time at the EITN, to participate in its activities, and to interact with the postdocs and HBP Partners present. We believe that this is an essential role of the EITN: to interact with the community by advertising and disseminating results from HBP, and also by incorporating new ideas and theories into the Project.



Annex A: EITN Events

Date	Event	Session Title	Speakers
<i>Past Events</i>			
26/3/14	Kickoff Workshop - WP4.5-	Bridging Scales	Alain Destexhe (CNRS, HBP), Markus Diesman (Jülich Research Center, HBP), Gaute Einevoll (UMB Oslo, HBP), Srdjan Ostojic (ENS, HBP), Olivier Faugeras (INRIA, HBP)
26/3/14	Kickoff Workshop - WP4.5-	Plasticity And Learning	Wulfram Gestner (EPFL, HBP), Walter Senn (U. Bern, HBP), Misha Tsodyks (Weizmann Institute of Science, HBP), Viktor Jirsa (University Aix-Marseille, HBP)
26/3/14	Kickoff Workshop - WP4.5-	Modeling Of Cognitive Functions	Gustavo Deco (UPF Barcelona, HBP), Neil Burgess (UCL London, HBP), Martin Giese (University Tübingen, HBP), Jean-Pierre Nadal (ENS)
26/3/14	Kickoff Workshop - WP4.5-	Principles Of Computation	Wolfgang Maass (TU Graz, HBP), Romain Brette (IDV), Boris Gutkin (ENS), Karlheinz Meier (U. Heidelberg, HBP), Andreas Herz (LMU Munich)
27/3/14	HBP Board Meeting		
18/4/13	Local Theory Meeting 1 - Task T4.1.1+ T.4.4.3	Reading The Population Code Of The Retina	OLIVIER MARRE (Institut de la Vision, HBP)
29/4/14	Local Theory Meeting 2 - Task T4.1.1+ T.4.4.3	Timing Cues For Azimuthal Sound Source Localization	VICTOR BENICHOUX (Institut de la Vision)
6/5/14	Brainstorming Workshop - T4.1.2	Measuring Of Cortical Impedances	Alain Destexhe (CNRS, HBP), Laurent Venance (College de France), Matthew Nelson (NeuroSpin), Thierry Bal (CNRS) and Claude Bedard (CNRS, HBP)
19/5/14	Cnrs-Unic Data Club - Presentation Of The Institute - Cnrs	Brain Waves	LYLE MÜLLER (CNRS)
27/5/14	Local Theory Meeting 3 - Task T4.1.1+ T.4.4.3	Neuromorphic Event-Based Time Oriented Vision, A Framework To Unify Computational And Biological Vision	RYAD BENOSMAN (Institut de la Vision)



Date	Event	Session Title	Speakers
<i>Past Events (cont'd)</i>			
3/6/14	Seminar	Keeping The Beat, Homeostatic Frequency Control In Coupled Oscillators	BARD ERMENTROUT (VISITING GUEST from the Univ. of Pittsburgh, USA)
5/6/14	Brainstorming Workshop - T4.1.2	Electric And Magnetic Stimulation Of The Brain	Myriam Pannetier (CEA), Frederic Chavane (INT, Marseille), Pascale Pham (CEA), Alain Destexhe (CNRS, HBP) and Thierry Bal (CNRS)
10/6/14	Local Theory Meeting 4 - T4.1.1 + T4.4.3	Microscades Enable Efficient Synchrony-Based Visual Feature Learning And Detection	TIMOTHEE MASQUELIER (Institut de la Vision)
11/6/14	SP3-SP4 Horizontal Meeting Day 1 - Task T4.3.1 + T4.3.3	Spontaneous Activity And Resting State Networks	Gustavo Deco (UPF, HBP), Viktor Jirsa (Aix-Marseille U., HBP), Pablo Barttfeld (NeuroSpin)
12/6/14	SP3-SP4 Horizontal Meeting Day 2 - Task T4.3.1 + T4.3.3	Probabilistic Aspects Of Brain Computations	Florent Meyniel (NeuroSpin), Sophie Deneve (ENS), Stan Dehaene (NeuroSpin, HBP)
12/6/14	SP3-SP4 Horizontal Meeting Day 2 - Task T4.3.1 + T4.3.3	Spatial Navigation And Place Cell Activity	Neil Burgess (UCL, HBP), David Kappel (TUG), Karim Benchenane (ESPCI)
17/6/14	Workshop- French National Node Of The INCF - No HBP	NEUROINFORMATICS WORKSHOP	Andrew Davison (CNRS, HBP), Jean-Baptiste Poline (NeuroSpin), Paula Sanz Leon (Marseille), Marcel Stimberg (IDV), Thomas Brochier (INT Marseille), Alexandre Gramfort (CNRS), Yann Le Franc (Antwerp U), Dimitri Papadopoulos (INRIA), Roberto Toro (CNRS), Michel Doja (Fourier Grenoble)
24/6/14	Local Theory Meeting 5 - T4.1.1 + T4.4.3	Reservoir Computing, Random Representations And Learning With Noise	MATHIEU GALTIER (CNRS, HBP)
27/6/14	Workshop - T4.1.2	Modeling Extracellular Impedances	Alain Destexhe (CNRS, HBP), Jean-Marie Gomes (CNRS), Matthew Nelson (NeuroSpin), Laurent Venance (College de France)



Date	Event	Session Title	Speakers
<i>Past Events (cont'd)</i>			
4/8/14	Workshop - T4.1.1	Dendritic Computations	Idan Segev (HUJI Hebrew University Israël, HBP), Alain Destexhe (CNRS, HBP), Francesca Barbieri (CNRS), Mathieu Galtier (CNRS, HBP)
11/9/14	Workshop - T4.1.2	Modeling Electric And Magnetic Brain Signals	Myriam Pannetier (CEA), Claude Bedard (CNRS-UNIC), Francesca Barbieri (CNRS-UNIC), Lauri Parkkonen (Helsinki), Alain Destexhe (CNRS, HBP)
18/9/14	Official Institutional Inauguration		Thomas Skordas (Director of FET Flagship Unit, EC), Henry Markram (HBP Coordinator, EPFL), Bernard Poulain (Directorate of Life Sciences, CNRS), José-Alain Sahel (Director, Vision Institute, Paris), Alain Destexhe (CNRS, HBP)
8-9/10/14	HBP-Brainscales Interface Meeting - T4.1.2 + T4.4.1	Missing Interactions In Spike-Based Computations	Alain Destexhe (CNRS, HBP), Gaute Einevoll (UMB Oslo, HBP), Mathieu Galtier (CNRS, HBP), Marja-Leena Linne (TUT, HBP), Mavi Sanchez (UPF, HBP), Sara Gonzalez (U Geneva), Olivier Faugeras (INRIA, HBP), Mark de Kamps (U Leeds, HBP), Michelle Thieullen (UPMC), Etienne Tanré (INRIA), Anders Lansner (KTH, HBP), Gustavo Deco (UPF, HBP), Per Roland (UCL), Stefan Klaas Enno, Thomas Hannagan (NeuroSpin)
27-28/11/14	Workshop - T4.4.1	Stochastic Neural Computations	Jozsef Fiser (Central European University Budapest), Mate Lengyel (Cambridge University), Daniel Pressnitzer (ENS), Karlheinz Meier (U. Heidelberg, HBP), Robert Legenstein (TUG), David Kappel (TUG), Mihai Petrovici (UHEI), Ilja Bytschok, Zeno Jonke (TUG), Wolfgang Maass (TUG), Guillaume Hennequin (UPMC), Johannes Bill (TUG)



Date	Event	Session Title	Speakers
<i>Upcoming Events</i>			
11-12/12/13	Workshop - T4.1.1	Dendritic Computations	David McCormick (Yale), Mike Hausser (UCL), Matthew Larkum (TU Berlin), Alain Destexhe (CNRS, HBP), Idan Segev (HUJI, HBP) and others...
16-17/12/14	Workshop - T4.3.1 + T4.3.3	Thalamocortical Interactions	Yves Fregnac (CNRS, HBP), Stanislas Dehaene (NeuroSpin, HBP), and others
14-14/1/15	Workshop - T4.3.1	Confronting Mean-Field Theories To Measurements: A Perspective From Neuroscience	
2-3/4/15	Meeting - SP4-SP9	To Be Determined	Organised by Alain Destexhe (CNRS, HBP) and Karlheinz Meier (U. Heidelberg, HBP)
2-4/4/15	Workshop - T4.2.1 + T4.2.2	Workshop On Plasticity And Learning	Organised by Walter Senn Schenker (U. Bern, HBP) and Wulfram Gerstner (EPFL, HBP)
Date to be confirmed, 2015	Workshop - T4.3.4	Computing With Glial Cells	Organised by Marja-Leena Line (TUT, HBP)