**Researcher (Post-Doc) position available immediately**

A new European Research Council (ERC) Consolidator grant starts for 5 years (~ 2 million euros). The grant “LIGHTUP – Turning the cortically blind brain to see” is awarded to prof. Marco Tamietto ([www.marcotamietto.com)](http://www.marcotamietto.com)).

The project investigates the neural correlates of visual awareness and of non-conscious vision in patients with *blindsight* and in non-human primates (macaques) with V1 damage. To this aim, a broad range of methods will be used, including 3T and 7T (f)MRI, neurophysiological recordings and brain stimulation (TMS) (please see Abstract below).

The project is embedded in an outstanding international and interdisciplinary context, including the University of Turin (IT), NIH (USA), the University of Oxford (UK), Tilburg University (NL) and, with granted access to their facilities.

We offer a full-time researcher post for 2 years extendible for other 2 years (pending positive assessment). Applications of highly motivated candidates with interests in systems neuroscience, vision sciences and neuroimaging are welcomed. The successful applicant will be appointed by the University of Tilburg (NL), but he/she will be expected to spend most of the time at the NIH in Bethesda (USA). In fact, the junior researcher will be co-supervised by prof. M. Tamietto and prof. D. Leopold, and the position is specifically focused on behavioural and fMRI studies in non-human primates.

**Selection process**

Evaluation of candidates begins immediately.

Candidates should contact [marco.tamietto@unito.it](mailto:tamiettolab@gmail.com) and/or [leopoldd@mail.nih.gov](mailto:leopoldd@mail.nih.gov), with a motivation letter and CV. Recommendation letters are also encouraged.

After initial feedback, candidates will be contacted directly for a Skype interview.

The successful candidate is expected to start immediately.

**Qualifications and Requirements**

Candidates should have a PhD in either: Neuroscience, Computational Neuroscience, Experimental Psychology, Neurobiology, Biomedical Engineering, Biophysics or equivalent fields.

The ideal candidate should have an appropriate CV with publications in international journals that testify expertise in neuroimaging and/or neurophysiology applied to human/non-human primates, a keen interest in investigating the visual system of non-human primates and in the research topics outlined in the project.

We particularly value methodological skills and previous experience in: neuroimaging, monkey neurophysiology, behavioural experiments involving training of non-human primates, recordings and data analysis, knowledge in scripting and scientific programming such as MatLab/Python, computational modelling and command of quantitative data analysis and statistics.

High proficiency in written and spoken English is required.

**Tasks**

The successful candidate is expected to:

- perform behavioural training of non-human primates

- actively participate in behavioural and fMRI data acquisition, processing and analysis in non-human primates.

- provide daily supervision to a PhD Student dedicated to the project and also working at NIH.

- support advancements in the theoretical and methodological framework for the study of blindsight and visual system in humans and monkeys.

- publish in peer-reviewed international journals in the field of neuroscience.

**What we offer**

- 2 + 2 years full-time appointment starting as soon as the candidate is selected for the post.

- Net salary between 2000-2500 euros per month ($ 2300-2900) depending on level of experience and specific taxation rules that apply.

- 1 PhD student dedicated to the project and under direct supervision for 4 years

- The opportunity to work in a highly multidisciplinary team and to join an innovative and fascinating project on blindsight and the neural bases of visual awareness.

- Additional costs, such as traveling, conference fees, or specific equipment will be covered.

- Extensive opportunity of interactions in an outstanding and international context with leaders in the field.

- No additional teaching duties.

For further information please contact directly Prof. M. Tamietto (marco.tamietto@unito.it ) and/or Prof. D. Leopold (leopoldd@mail.nih.gov).

**Abstract of LIGHTUP project**

Visual awareness - the online access to the content of our visual experience - affords flexibility and experiential richness, and its loss following brain damage has devastating effects on quality of life and functional recovery. However, patients with blindness following cortical damage may retain visual functions, despite visual awareness is lacking - a phenomenon known as ‘*blindsight*’-. LIGHTUP starts exploring a neglected fundamental issue: how can we translate non-conscious visual abilities into conscious ones after damage to the visual cortex? To answer this question, I propose to integrate into a coherent experimental framework human and monkey neuroscience. This will place our understanding of visual awareness on firm neurobiological and mechanistic bases. Next, LIGHTUP will translate this wisdom into evidence-based clinical intervention.

First, LIGHTUP will apply computational neuroimaging methods to the *micro-scale* level of each single voxel -the smallest spatial scale achievable with functional magnetic resonance imaging (fMRI)-. We will estimate population receptive fields to natural images in humans and monkeys, thereby analysing fMRI signals similarly to the way tuning properties are ascribed to neurons in neurophysiology. These studies will clarify *how* a given brain structure translates visual properties into responses associated with awareness, and *how* the lesion alters response properties in *intact* areas.

Second, I will place this knowledge in the *macro-scale* context of dynamic system interactions across distant brain areas. LIGHTUP leverages a behavioural paradigm that can dissociate non-conscious visual abilities from visual awareness in monkeys, thus offering a refined animal model of visual awareness. This is an important step toward the unity of animal and human neuroscience, and a new path to establish functional homologies across primates. The next wave of progress consists in integrating this behavioural paradigm with fMRI. Applying behavioural-Dynamic Causal Modelling (bDCM), LIGHTUP will build up a quantitative and refutable Bayesian framework that specifies the directionality of information flow in the interactions across brain areas, and their causal role in generating visual awareness.

The third part of the project will devise a rehabilitation protocol to promote the (re)emergence of lost visual awareness following visual cortex damage. Here we will combine in a multimodal approach the two major inducers of neural plasticity: brain stimulation and visual training. LIGHTUP will exploit non-invasive transcranial magnetic stimulation (TMS) in a novel protocol that enables stimulation of complex cortical circuits, rather than of a single area, and selects the direction of connectivity that is enhanced. This associative stimulation has been proven to induce Hebbian plasticity and we have piloted its effects in fostering visual awareness in association with visual restoration training.

By departing from current mainstream, I propose to focus on new questions, bring our understanding of visual awareness to the next level, and inspire a new wave of empirical studies in human and non-human neuroscience.