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**PROFESSIONAL ADDRESS**

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**CURRENT POSITION**

Assistant Professor  
Neurology Department (primary) & Psychiatry Department (affiliate)  
University of Wisconsin, Madison, USA

**EDUCATION**

2005: **Medical Doctor**, University of Liège, Belgium: Summa Cum Laude  
2009: **Doctor of Philosophy (PhD)**, University of Liège, Belgium: *'Residual brain function in patients with disorders of consciousness: differences between minimally conscious state and vegetative state'*;  
Research Mentor: Dr Steven Laureys  
2010: **Neurology University Degree**, University of Liège, Belgium: Summa Cum Laude 2012: **Belgian Neurology Board Certification**, National Board of Examiners, Belgium  
2009-2014: **Postdoctoral Research Fellow**, University of Liège, Belgium, University College London, UK & University of Wisconsin, Madison  
2013-2017: **Neurology Residency**, University of Wisconsin, Madison  
2014-2018: **Assistant Scientist**, University of Wisconsin, Madison  
2015: **Wisconsin Medical Licensure**  
2017: **US Neurology Board Certification**, American Board of Psychiatry and Neurology  
2017-2018: **Clinical Neurophysiology/Epilepsy Fellowship**, University of Wisconsin, Madison

**ADDITIONAL TRAINING**

2001-2005: Undergraduate Research Fellow at the Cyclotron Research Center, University of Liège, Belgium (with **Dr Steven Laureys**)  
2005 May-June: Honorary Research Fellow at the Wolfson Brain Imaging Centre and MRC Cognition and Brain Sciences Unit, University of Cambridge, UK (with **Dr Adrian Owen**).  
2008 September-November: Visiting Research Fellow at the Center for Sleep and Consciousness, University of Wisconsin, Madison (with **Dr Giulio Tononi & Dr Chiara Cirelli**)

2009 April-December: full time training in TMS-EEG data acquisition and analysis with **Dr Marcello Massimini**, University of Milan, Italy

2010 January-December: Postdoctoral training in Dynamic Causal Modeling for M/EEG at the Functional Imaging Laboratory, University College London, UK (in **Dr Karl Friston's** Theoretical Neurobiology group)

2017 July: Visiting Scientist training to analyze single neuron recordings with Utah arrays and Benhke-Fried intracranial electrode recordings at Columbia University, NYC (with **Dr Caterine Schevon**)

## **HONORS AND AWARDS**

2005: Award of the best poster, Belgian Stroke Council, Neurobelgium 2006.

2005: Student Award, Fondation Léon Frédéricq, Liège, Belgium.

2005: Second Aventis Award, Liege, Belgium.

2007: Best student poster award, Association for the Scientific Study of Consciousness, Oxford, UK

2008: Research travel grant to the University of Wisconsin, University of Liège

2007-2010: Research & Travel Awards, Fondation Léon Frédéricq, Liège, Belgium

2009: British Royal Society Research Travel Grant

2010 : Fondation Jaumain Award, Liège, Belgium

2010 : **US E-11 Green Card Visa (for Extraordinary Ability in the Field of Science)**

2011 : Belgian American Educational Foundation Postdoctoral Research Award

2012 : Research travel grant to the University of Wisconsin, University of Liège

2013: **Tom Slick Award, Mind Science Foundation (PI)**

2016: Medical Student Teaching Award, University of Wisconsin - Madison WI

2016: **NINDS RO3 1R03NS096379, Boly (PI)**

2016: **Young Investigator Award, American Epilepsy Society**

2017: American Citizenship

2017-2018: Visiting Researcher, NYU

2017-: Visiting Scientist, Yale University

2017: Visiting Scientist, Columbia University

2017-: Research Collaborator, Mayo Clinic

## **EDITORIAL AND OTHER PROFESSIONAL EXPERIENCE**

### ***Professional Memberships***

American Neurological Association, American Academy of Neurology, American Epilepsy Society, Wisconsin Neurological Association, Association for the Scientific Study of Consciousness, Organization for Human Brain Mapping

### ***Editorial/Reviewing Experience***

Associate Editor for Neuroimage, Frontiers in Consciousness Research, Frontiers in Brain Imaging Methods, BMC Neurology, Neuroscience of Consciousness, Journal of Consciousness Studies

Guest Editor for a Special Issue of Archives Italiennes de Biologie, 2012

Ad hoc reviewer for Nature Reviews Neuroscience, Journal of Neuroscience, Brain, PNAS, Neuroimage, Human Brain Mapping, Cerebral Cortex, Anesthesiology, Critical Care Medicine, American Journal of Psychiatry (among others)

Conference Scientific Committee – Towards a Science of Consciousness, April 2012

## REPRESENTATIVE PUBLICATIONS

1. Owen AM, Coleman MR, **Boly M**, Davis MH, Laureys S, Pickard JD. Detecting awareness in the vegetative state. *Science* 313(5792) (2006) 1402
2. **Boly M**, Balteau E, Schnakers C, Degueldre C, Moonen G, Luxen A, Phillips C, Peigneux P, Maquet P, Laureys S. Baseline brain activity fluctuations predict somatosensory perception in humans. *PNAS* 104(29) (2007) 12187-92.
3. **Boly M**, Faymonville ME, Schnakers C, Peigneux P, Lambermont B, Phillips C, Lancellotti P, Luxen A, Lamy M, Moonen G, Maquet P, Laureys S. Perception of pain in the Minimally Conscious State with PET activation: an observational study. *Lancet Neurology* 7(11) (2008) 1013-20
4. Monti M\*, Vanhaudenhuyse A\*, Coleman MR, **Boly M**, Pickard JR, Tshibanda L, Owen AM, Laureys S. Willful Modulation of Brain Activity in Disorders of Consciousness. *New England Journal of Medicine* 362(7) (2010) 579-89 (\*co-first authors)
5. **Boly M**, Garrido MI, Gosseries O, Bruno MA, Schnakers C, Massimini M, Litvak V, Laureys S, Friston K. Preserved feedforward but impaired top-down processes in the vegetative state. *Science* 332(6031) (2011) 858-62
6. Stender J, Gosseries O, Bruno MA, Charland-Verville V, Vanhaudenhuyse A, Demertzi A, Chatelle C, Thonnard M, Thibaut A, Heine L, Soddu A, **Boly M**, Schnakers C, Gjedde A, Laureys S. Diagnostic precision of PET imaging and functional MRI in disorders of consciousness: a clinical validation study. *Lancet* 9:384(9942) (2014) 514-22
7. Gosseries O, Di H, Laureys S, **Boly M**. Measuring consciousness in severely damaged brains. *Annu Rev Neurosci* 37 (2014) 457-78
8. Deco G, Tononi G, **Boly M**, Kringelbach M. Rethinking segregation and integration in the human brain: contributions of whole-brain computational modeling. *Nat Rev Neurosci* 16(7) (2015) 430-9
9. Sarasso S\*, **Boly M**\*, Napolitani M, Gosseries O, Charland-Verville V, Casarotto S, Rosanova M, Casali AG, Brichant JF, Boveroux P, Rex S, Tononi G, Laureys S, Massimini M. Consciousness and Complexity during Unresponsiveness Induced by Propofol, Xenon, and Ketamine. *Curr Biol* 25(23) (2015) 3099-105 (\*co-first authors)
10. Koch C, Massimini M, **Boly M**, Tononi G. The neural correlates of consciousness: progress and problems. *Nat Rev Neurosci* 17(5) (2016) 307-21
11. Tononi G, **Boly M**, Massimini M, Koch C. Integrated information theory: from consciousness to its physical substrate. *Nat Rev Neurosci* 17(7) (2016) 450-461
12. **Boly M**, Jones B, Findlay G, Plumley Erin, Mensen A, Hermann B, Tononi G, Maganti R. Altered sleep homeostasis correlates with cognitive impairment in patients with focal epilepsy. *Brain* 140(4) (2017) 1026-104
13. **Boly M**, Massimini M, Tsuchiya N, Postle BR, Koch C, Tononi G. Are The Neural Correlates Of Consciousness In The Front Or In The Back Of The Cerebral Cortex? Clinical And Neuroimaging Evidence. *Journal of Neuroscience* 37(40) (2017) 9603-9613

Google Scholar H-index: 68

## PEER-REVIEWED PUBLICATIONS

### *First or last author*

1. **Boly M**, Faymonville ME, Peigneux P, Lambermont B, Damas P, Del Fiore G, Degueldre C, Franck G, Luxen A, Lamy M, Moonen G, Maquet P, Laureys S. Auditory processing in severely brain injured patients: differences between the minimally conscious state and the persistent vegetative state. *Archives of Neurology* 61 (2004) 233-238
2. **Boly M**, Faymonville ME, Peigneux P, Lambermont B, Damas F, Luxen A, Lamy M, Moonen G, Maquet P, Laureys S. Cerebral processing of auditory and noxious stimuli in severely brain injured patients: differences between VS and MCS. *Neuropsychological Rehabilitation* 15(3-4) (2005) 283-9
3. **Boly M**, Coleman MR, Davis MH, Hampshire A, Bor D, Moonen G, Maquet PA, Pickard JD, Laureys S, Owen AM. When thoughts become action: An fMRI paradigm to study volitional brain activity in non-communicative brain injured patients. *Neuroimage* 36(3) (2007) 979-92
4. **Boly M**, Balteau E, Schnakers C, Degueldre C, Moonen G, Luxen A, Phillips C, Peigneux P, Maquet P, Laureys S. Baseline brain activity fluctuations predict somatosensory perception in humans. *PNAS* 104(29) (2007) 12187-92.
5. **Boly M**, Salmon E, Laureys S. Brain function in altered states of consciousness: comparison between Alzheimer Dementia and Vegetative State. *Cognitive Sciences* 2 (2006) 44-64
6. **Boly M**, Phillips C, Tshibanda JF, Vanhaudenhuyse A, Schabus M, Dang-Vu TT, Moonen G, Hustinx R, Maquet P, Laureys S. Intrinsic brain activity in altered states of consciousness – how conscious is the default mode of brain function? *Annals of the New York Academy of Sciences* 1129 (2008) 119-29
7. **Boly M**, Phillips C, Balteau E, Schnakers C, Degueldre C, Moonen G, Luxen A, Peigneux P, Faymonville ME, Maquet P, Laureys S. Consciousness and cerebral baseline brain activity fluctuations. *Human Brain Mapping* 29(7) (2008) 868-74
8. Laureys S, **Boly M**. What is it like to be vegetative or minimally conscious? *Current Opinion in Neurology* 20(6) (2007) 609-13
9. Laureys S, **Boly M**. The Changing Spectrum of Coma. *Nature Clinical Practice Neurology* 4(10) (2008) 544-6
10. **Boly M**, Faymonville ME, Schnakers C, Peigneux P, Lambermont B, Phillips C, Lancellotti P, Luxen A, Lamy M, Moonen G, Maquet P, Laureys S. Perception of pain in the Minimally Conscious State with PET activation: an observational study. *Lancet Neurology* 7(11) (2008) 1013-20
11. **Boly M**, Tshibanda M, Vanhaudenhuyse A, Noirhomme Q, Schnakers C, Ledoux D, Boveroux P, Garweg C, Lambermont B, Phillips C, Luxen A, Moonen G, Bassetti C, Maquet P, Laureys S. Functional connectivity in the default network during resting state is preserved in a vegetative but not in a brain dead patient. *Human Brain Mapping* 30(8) (2009) 2393-400
12. **Boly M**, Massimini M, Tononi G. Theoretical approaches to the diagnosis of altered states of consciousness. *Progress in Brain Research* 177 (2009) 383-98
13. Vanhaudenhuyse A & Noirhomme Q, Tshibanda L, Bruno MA, Boveroux P, Schnakers C, Soddu A, Perlberg V, Ledoux D, Brichant JF, Moonen G, Maquet P, Greicius MD, Laureys S, **Boly M**. Default network connectivity reflects the level of consciousness in non-communicative brain damaged patients. *Brain* 133(Pt 1) (2010) 161-71

14. Boveroux P, Vanhaudenhuyse A, Noirhomme Q, Lauwick S, Luxen A, Degueldre C, Plenevaux A, Schnakers C, Phillips C, Brichant J-F, Bonhomme V, Maquet P, Greicius M, Laureys S, **Boly M**. Breakdown of within- and between-network resting state functional magnetic resonance imaging connectivity during propofol-induced loss of consciousness. *Anesthesiology* 113(5) (2010) 1038-53
15. Murphy M & Bruno MA, Riedner B, Boveroux P, Noirhomme Q, Landsness E, Laureys S, Tononi G, **Boly M**. Propofol anesthesia and sleep: a high-density EEG study. *Sleep* 34(3) (2011) 283-91A
16. **Boly M**. Measuring the fading consciousness in the human brain. *Current Opinion in Neurology* 24(4) (2011) 394-400
17. **Boly M**, Garrido MI, Gosseries O, Bruno MA, Schnakers C, Massimini M, Litvak V, Laureys S, Friston K. Preserved feedforward but impaired top-down processes in the vegetative state. *Science* 332(6031) (2011) 858-62
18. Landsness E & Bruno MA, Noirhomme Q, Riedner B, Gosseries O, Schnakers C, Massimini M, Laureys S, Tononi G, **Boly M**. Electrophysiological correlates of behavioural changes in vigilance in vegetative state and minimally conscious state. *Brain* 134(8) (2011) 2222-32
19. **Boly M** & Perlberg V, Marrelec G, Dang-Vu TT, Schabus M, Laureys S, Pellegrini-Isaac M, Maquet P, Benali H. Hierarchical clustering of brain activity during human non rapid eye movement sleep. *Proc Natl Acad Sci USA* 109(15) (2012) 5856-61
20. **Boly M**, Moran RJ, Murphy M, Boveroux P, Bruno MA, Noirhomme Q, Ledoux D, Bonhomme V, Brichant JF, Tononi G, Laureys S, Friston K. Connectivity differences underlying spectral EEG changes during propofol-induced loss of consciousness. *Journal of Neuroscience* 32(20) (2012) 7082-7090
21. **Boly M**, Massimini M, Garrido MI, Gosseries O, Noirhomme Q, Laureys S, Soddu A. Brain Connectivity in Disorders of Consciousness. *Brain Connectivity* 2(1) (2012) 1-10.
22. Laureys S, **Boly M**. Unresponsive Wakefulness Syndrome. *Archives Italiennes de Biologie* (2012)
23. Bonhomme V, Boveroux P, Brichant JF, Laureys S, **Boly M**. Neural correlates of consciousness during general anesthesia using functional magnetic resonance imaging. *Archives Italiennes de Biologie* (2012)
24. **Boly M**, Seth AK. Modes and Models in Disorders of Consciousness Science. *Archives Italiennes de Biologie* (2012)
25. **Boly M**, Sanders RD, Mashour GA, Laureys S. Consciousness and responsiveness: lessons from anaesthesia and the vegetative state. *Curr Opin Anaesthesiol* 26(4) (2013) 444-449
26. **Boly M**, Seth AK, Wilke M, Ingmundson P, Baars B, Laureys S, Edelman DB, Tsuchiya N. Consciousness in humans and non-human animals: recent advances and future directions. *Front Psychol* 4 (2013) 625.
27. Gosseries O, Di H, Laureys S, **Boly M**. Measuring consciousness in severely damaged brains. *Annu Rev Neurosci* 37 (2014) 457-78
28. **Boly M**, Maganti R. Monitoring epilepsy in the intensive care unit: current state of facts and potential interest of high density EEG. *Brain Injury* 28(9) (2014) 1151-5.
29. **Boly M**, Sasai S, Gosseries O, Oizumi M, Casali A, Massimini M, Tononi G. Stimulus set meaningfulness and neurophysiological differentiation: a functional magnetic resonance imaging study. *PLoS One* 13;10(5) (2015) e0125337
30. Sarasso S\*, **Boly M\***, Napolitani M, Gosseries O, Charland-Verville V, Casarotto S, Rosanova M, Casali AG, Brichant JF, Boveroux P, Rex S, Tononi G, Laureys S, Massimini M. Consciousness and Complexity during Unresponsiveness Induced by Propofol, Xenon, and Ketamine. *Curr Biol* 25(23) (2015) 3099-105 (\*co-first authors)

31. **Boly M**, Jones B, Findlay G, Plumley Erin, Mensen A, Hermann B, Tononi G, Maganti Rama. Altered sleep homeostasis correlates with cognitive impairment in patients with focal epilepsy. *Brain* 140(4) (2017) 1026-104
32. **Boly M**, Massimini M, Tsuchiya N, Postle BR, Koch C, Tononi G. Are The Neural Correlates Of Consciousness In The Front Or In The Back Of The Cerebral Cortex? Clinical And Neuroimaging Evidence. *Journal of Neuroscience* 37(40) (2017) 9603-9613
33. **Boly M**, Laureys S. Functional unlocking: bedside detection of covert awareness after severe brain damage. *Brain* 1; 141(5) (2018) 1239-1241
34. Sanders RD, Banks MI, Darracq M, Moran R, Sleight J, Gosseries O, Bonhomme V, Brichant JF, Rosanova M, Raz A, Tononi G, Massimini M, Laureys S, **Boly M**. Propofol-induced unresponsiveness is associated with impaired feedforward connectivity in cortical hierarchy. *Br J Anaesth.* 121(5) (2018) 1084-1096

### **Co-author**

35. Laureys S, Antoine S, **Boly M**, Elinx S, Faymonville ME, Berré J, Sadzot B, Ferring M, De Tiège X, Lambermont B, Damas P, Van Bogaert P, Del Fiore G, J, Degueldre C, Phillips C, Franck G, Vincent JL, Lamy M, Luxen A, Moonen G, Goldman S, Maquet P Brain function in the vegetative state. *Acta Neurologica Belgica* 102 (2002) 177-185
36. Maquet P, Laureys S, Perrin F, Ruby P, Melchior G, **Boly M**, Dang-Vu T, Desseilles M, Peigneux P. Festina Lente: Evidence for fast and slow learning processes and a role for sleep in human motor skill learning. *Learning and memory* 10 (2003) 237-239
37. Maquet P, Peigneux P, Laureys S, Desseilles M, **Boly M**, Dang-Vu T. Off-line processing of memory traces during human sleep: Contribution of functional neuroimaging. *Sleep and Biological Rhythms* 1 (2003) 75–83
38. Maquet P, Peigneux P, Laureys S, **Boly M**, Dang-Vu T, Desseilles M, Cleeremans A. Memory processing during human sleep as assessed by functional neuroimaging. *Rev Neurol* 159 (2003) 6S27-6S29
39. Laureys S, Perrin F, Faymonville ME, Schnakers C, **Boly M**, Bartsch V, Majerus S, Moonen G, Maquet P. Cerebral processing in the minimally conscious state. *Neurology* 63 (2004) 916-918
40. Maquet P, Ruby P, Schwartz S, Laureys S, Albouy G, Dang-Vu T, Desseilles M, **Boly M**, Peigneux P. Regional organisation of brain activity during paradoxical sleep. *Archives Italiennes de Biologie* 142 (2004) 413-419
41. Maquet P, Ruby P, Maudoux A, Albouy G, Sterpenich V, Dang-Vu T, Desseilles M, **Boly M**, Perrin F, Peigneux P, Laureys S. Human cognition during REM sleep and the activity profile within frontal and parietal cortices: a reappraisal of functional neuroimaging data. *Progress in Brain Research* 150 (2005) 219-227
42. Laureys S, Perrin F, Schnakers C, **Boly M**, Majerus S. Residual cognitive function in comatose, vegetative and minimally conscious states. *Current Opinion in Neurology* 18(6) (2005) 726-733
43. Fumal A, Laureys S, Di Clemente L, **Boly M**, Bohotin V, Vandenneede M, Coppola G, Salmon E, Kupers R, Schoenen J. Orbitofrontal involvement in chronic analgesic-overuse headache evolving from episodic migraine. *Brain* 129(Pt2) (2006) 534-550.
44. Faymonville ME, **Boly M**, Laureys S. Functional neuroanatomy of the hypnotic state. *J Physiol Paris* 99(4-6) (2006) 463-469

45. Laureys S, **Boly M**, Maquet P. Tracking recovery of consciousness from coma. *Journal of Clinical Investigation* 116(7) (2006) 1823-1825
46. Schnakers C, Giacino J, Kalmar K, Piret S, Lopez E, **Boly M**, Malone R, Laureys S. Does the FOUR score correctly diagnose the vegetative and minimally conscious states? *Annals of Neurology* 60(6) (2006) 744-5
47. Owen AM, Coleman MR, **Boly M**, Davis MH, Laureys S, Pickard JD. Detecting awareness in the vegetative state. *Science* 313(5792) (2006) 1402
48. Owen AM, Coleman MR, **Boly M**, Davis MH, Laureys S, Jolles D, Pickard J. Response to comments on "Detecting awareness in the vegetative state" [technical comment] *Science* 315 (2007) 1221
49. Kupers R, Maeyaert J, **Boly M**, Faymonville ME, Laureys S. Naloxone-insensitive epidural placebo analgesia in a chronic pain patient. *Anesthesiology* 106(6) (2007) 1239-42
50. Schabus M, Dang-Vu TT, Albouy G, Balteau E, **Boly M**, Carrier J, Darsaud A, Degueldre C, Desseilles M, Gais S, Phillips C, Rauchs G, Schnakers C, Sterpenich V, Vandewalle G, Luxen A, Maquet P. Hemodynamic cerebral correlates of sleep spindles during human non-rapid eye movement sleep. *PNAS* 104(32) (2007) 13164-9
51. Owen AM, Coleman MR, **Boly M**, Davis MH, Laureys S, Pickard JD. Using functional magnetic resonance imaging to detect covert awareness in the vegetative state. *Archives of Neurology* 64(8) (2007) 1098-102
52. Sterpenich V, Albouy G, **Boly M**, Vandewalle G, Darsaud A, Balteau E, Dang-Vu TT, Desseilles M, D'Argembeau A, Gais S, Rauchs G, Schabus M, Degueldre C, Luxen A, Collette F, Maquet P. Sleep-related hippocampo-cortical interplay during emotional memory recollection. *PLoS Biology* 5(11) (2007) e282
53. Gais S, Albouy G, **Boly M**, Dang-Vu TT, Darsaud A, Desseilles M, Rauchs G, Schabus M, Sterpenich V, Vandewalle G, Maquet P, Peigneux P. Sleep transforms the cerebral trace of declarative memories. *PNAS* 104(47) (2007) 18778-83
54. Schnakers C, Hustinx R, Vandewalle G, Majerus S, Moonen G, **Boly M**, Vanhaudenhuyse A, Laureys S. Measuring the effect of amantadine in chronic anoxic minimally conscious state. *J Neurol Neurosurg Psychiatry* 79(2) (2008) 225-7
55. Schnackers C, Majerus S, Goldman S, **Boly M**, Van Eeckhout P, Gay S, Bartsch V, Peigneux P, Moonen G, Laureys S. Cognitive function in the locked-in syndrome. *J Neurol* 225(3) (2008) 323-30
56. Boveroux P, Bonhomme V, **Boly M**, Vanhaudenhuyse A, Maquet P, Laureys S. Brain function in physiologically, pharmacologically and pathologically altered states of consciousness. *International Anesthesiology Clinics* 46(3) (2008) 131-46
57. Laureys S, **Boly M**, Moonen G. The Boundaries of consciousness: lessons from coma and related states. *Advances in Clinical Neuroscience and Rehabilitation* 8 Suppl (2008) 4-5
58. Schnakers C, Majerus S, Giacino J, Vanhaudenhuyse A, Bruno MA, **Boly M**, Moonen G, Damas P, Lambermont B, Lamy M, Damas F, Ventura M, Laureys S. A French validation study of the Coma Recovery Scale-Revised (CRS-R). *Brain Injury* 22(10) (2008) 786-92
59. Demertzi A, Vanhaudenhuyse A, Bruno MA, Schnakers C, **Boly M**, Boveroux P, Maquet P, Moonen G, Laureys S. Is there anybody in there? Detecting awareness in disorders of consciousness. *Expert Reviews of Neurotherapeutics* 8(11) (2008) 1719-30
60. Schnakers C, Perrin F, Schabus M, Majerus S, Ledoux D, Damas P, **Boly M**, Vanhaudenhuyse A, Bruno MA, Moonen G, Laureys S. Voluntary brain processing in disorders of consciousness. *Neurology* 71(20) (2008) 1614-20

61. Dang-Vu TT, Schabus M, Desseilles M, Albouy G, **Boly M**, Darsaud A, Gais S, Rauchs G, Sterpenich V, Vandewalle G, Carrier J, Moonen G, Balteau E, Degueldre C, Luxen A, Phillips C, Maquet P. Spontaneous neural activity during human slow wave sleep. *PNAS* 105(39) (2008) 15160-5
62. Di H, **Boly M**, Weng X, Ledoux D, Laureys S. Neuroimaging activation studies in the vegetative state: predictors of recovery? *Clinical Medicine* 8(5) (2008) 502-7
63. Schnakers C, Ledoux D, Majerus S, Damas P, Damas F, Lambermont B, Lamy M, Boly M, Vanhaudenhuyse A, Moonen G, Laureys S. Diagnostic and prognostic use of bispectral index in coma, vegetative state and related disorders. *Brain Injury* 22(12) (2008) 926-31.
64. Schnakers C, Perrin F, Schabus M, Hustinx R, Majerus S, Moonen G, **Boly M**, Vanhaudenhuyse A, Bruno MA, Laureys S. Detecting consciousness in a total locked-in syndrome: An active event-related paradigm. *Neurocase* 25 (2008) 1-7
65. Kirsch M, Boveroux P, Massion P, Sadzot B, **Boly M**, Lambermont B, Lamy M, Damas P, Damas F, Moonen G, Laureys S, Ledoux D Predicting prognosis in post-anoxic coma. *Revue Médicale de Liège* 63(5-6) (2008) 263-8
66. Gosseries O, Demertzi A, Noirhomme Q, Tshibanda J, Boly M, de Beeck MO, Hustinx R, Maquet P, Salmon E, Moonen G, Luxen A, Laureys S, De Tiège X. Functional neuroimaging (fMRI, PET and MEG): what do we measure? *Revue Médicale de Liège* 63(5-6) (2008) 231-7
67. Chatelle C, Vanhaudenhuyse A, Mergam AN, De Val M, Majerus S, **Boly M**, Bruno MA, Boveroux P, Demertzi A, Gosseries O, Ledoux D, Peigneux P, Salmon E, Moonen G, Faymonville ME, Laureys S, Schnakers C. Pain assessment in non-communicative patients. *Revue Médicale de Liège* 63(5-6) (2008) 429-37
68. Bruno MA, Pellas F, Bernheim JL, Ledoux D, Goldman S, Demertzi A, Majerus S, Vanhaudenhuyse A, Blandin V, **Boly M**, Boveroux P, Moonen G, Laureys S, Schnakers C. Life with Locked-in syndrome. *Revue Médicale de Liège* 63(5-6) (2008) 445-51.
69. Tshibanda L, Vanhaudenhuyse A, Bruno MA, **Boly M**, Soddu A, Laureys S, Moonen G. MRI in coma survivors *Revue Médicale de Liège* 64 (2009) 42-48
70. Vanhaudenhuyse A, **Boly M**, Balteau E, Schnakers C, Moonen G, Luxen A, Lamy M, Degueldre C, Bricchant JF, Maquet P, Laureys S, Faymonville ME. Pain and non-pain processing during hypnosis: a thulium-YAG event-related fMRI study. *Neuroimage* 47(3) (2009) 1047-54
71. Schnakers C, Vanhaudenhuyse A, Giacino J, Ventura M, **Boly M**, Majerus S, Moonen G, Laureys S. Diagnostic accuracy of the vegetative and minimally conscious state: clinical consensus versus standardized neurobehavioral assessment. *BMC Neurology* 21 (2009) 9:3
72. Noirhomme Q, **Boly M**, Bonhomme V, Boveroux P, Phillips C, Peigneux P, Soddu A, Luxen A, Moonen G, Maquet P, Laureys S. Bispectral index correlates with regional cerebral blood flow during sleep in distinct cortical and subcortical structures in humans. *Arch Ital Biol* 147(1-2) (2009) 51-7
73. Massimini M, **Boly M**, Casali A, Rosanova M, Tononi G A perturbational approach for evaluating the brain's capacity for consciousness. *Progress in Brain Research* 177 (2009) 201-14
74. Tshibanda L, Vanhaudenhuyse A, Galanaud D, **Boly M**, Laureys S, Puybasset L Magnetic resonance spectroscopy and diffusion tensor imaging in coma survivors: promises and pitfalls. *Progress in Brain Research* 177 (2009) 215-29
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135. Turski CA, Kessler-Jones A, Chow C, Hermann B, Hsu D, Jones J, Seeger SK, Chappell R, **Boly M**, Ikonomidou C. Extended Multiple-Field High-Definition transcranial direct current stimulation (HD-tDCS) is well tolerated and safe in healthy adults. *Restor Neurol Neurosci* 35(6) (2017) 631-642
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138. Rosanova M, Fecchio M, Casarotto S, Sarasso S, Casali AG, Pigorini A, Comanducci A, Seregini F, Devalle G, Citerio G, Bodart O, **Boly M**, Gosseries O, Laureys S, Massimini M. Sleep-like cortical OFF-periods disrupt causality and complexity in the brain of unresponsive wakefulness syndrome patients. *Nat Commun*. 2018 Oct 24;9(1):4427
139. Baird B, Castelnovo A, Riedner BA, Lutz A, Ferrarelli F, **Boly M**, Davidson RJ, Tononi G. Human Rapid Eye Movement Sleep Shows Local Increases in Low-Frequency Oscillations and Global Decreases in High-Frequency Oscillations Compared to Resting Wakefulness. *eNeuro*. 2018 Aug 29;5(4). pii: ENEURO.0293-18.2018.
140. Li Y, Funk C, Dawkins D, Simpson D, Yu JJ, **Boly M**, Ahmed A. Leptomeningeal Enhancement Is Associated with Transient Neurologic Deficits after Flow Diversion of Intracranial Aneurysms. *World Neurosurg*. 2018 Dec;120:e94-e99.

## WORK IN PROGRESS

1. Valomon A, Riedner B, Jones S, Goodpaster R, Tononi G, Plante D, Benca R, **Boly M**. Regional pattern of high-density electroencephalographic activity in REM sleep behavior disorder. *Abstract presented at Neuroscience 2017; Oral presentation at ERSR 2018. Manuscript in prep*
2. Juan E, Bugnon T, Findlay G, Verhagen R, Mensen A, Schevon C, Devinsky O, Maganti R, Tononi G, Blumenfeld H, **Boly M**. Diverse mechanisms for ictal loss of consciousness: a comparison of intracranial recordings during complex partial and secondarily generalized seizures. *Abstract presented at Neuroscience 2017 & American Epilepsy Society Meeting, New Orleans 2018. Manuscript in prep*
3. Verhagen R, Findlay G, Jones B, Juan E, Bugnon T, Mensen A, Blumenfeld H, Tononi G, Maganti R, **Boly M**. Neural correlates of loss of consciousness in simple versus complex partial seizures: a high-density EEG study. *Abstract presented at Neuroscience 2017 & American Epilepsy Society Meeting 2017. Manuscript in prep*
4. Kang X, **Boly M**, Williams C, Findlay G, Jones B, Gjini K, Maganti R, Struck AF. Quantitative spatio-temporal characterization of epileptic spikes using high density EEG: Differences between NREM sleep

and REM sleep. *Abstract presented at American Epilepsy Society Meeting, New Orleans, LA, December 2018. Manuscript in prep*

5. Song C, **Boly M**, Tagliazzuchi E, Laufs E, Tononi G. BOLD oscillation during human sleep. *Manuscript submitted to eLife*

6. Lundstrom B, **Boly M**, Duckrow R, Zaveri H, Blumenfeld H. Slowing less than 1 Hz is decreased near the seizure onset zone. *Submitted to Scientific Reports, reviewed & under revision*

7. Comolatti R, Pigorini A, Casarotto S, Fecchio M, Faria G, Sarasso S, Rosanova M, Gosseries O, **Boly M**, Bodart O, Ledoux D, Brichant JF, Nobili L, Laureys S, Tononi G, Massimini M, Casali A. A fast and general method to empirically estimate the complexity of brain responses to transcranial and intracranial stimulations. *Submitted to Brain Stimulation*

8. Colombo M, Napolitani M, **Boly M**, Gosseries O, Casarotto S, Rosanova M, Brichant JF, Boveroux P, Rex S, Laureys S, Massimini M, Chierigato A, Sarasso S. The EEG Spectral Exponent Indexes the Presence of Consciousness during Unresponsiveness Induced by Propofol, Xenon, and Ketamine. *Submitted to Neuroimage, reviewed & under revision*

9. Patlatzoglou K, Chennu S, **Boly M**, Noirhomme Q, Bonhomme V, Brichant JF, Gosseries O, Laureys S. Deep Neural Networks for Automatic Classification of Anesthetic-Induced Unconsciousness. *International Conference, BI 2018, Arlington, TX, USA, December 7–9, 2018, Proceedings. Manuscript in prep*

10. Baird, B., Riedner, B., **Boly, M**. Davidson, R., & Tononi, G. Increased lucid dream frequency in long-term meditators but not following MBSR Training. *Psychology of Consciousness, accepted for publication*

11. Moffet E, Jones, B, Findlay G, Verhagen R, Juan E, Bugnon T, Mensen A, Struck A, Tononi G, Maganti R, **Boly M**. Increased NREM Sleep Slow Wave Activity Colocalizes with Clinically Suspected Epileptic Focus in a Patient With Reflex Epilepsy: A High-Density EEG Case Study. *Abstract presented at American Epilepsy Society Meeting, New Orleans, LA, 12/2/2018. Manuscript in prep*

12. Pankratz J, Sasai S, Struck AF, Hwang G, Nair V, Almane D, Dabbs K, Maganti R, Felton E, DeYoe E, Rhagavan R, Birn R, Prabhakaran V, Binder J, Meyerand E, **Boly M**. Increased Short-Range Functional MRI Connectivity in Limbic Network Correlates With Seizure Frequency and Cognitive Impairment in Temporal Lobe Epilepsy Patients. *Abstract presented at American Epilepsy Society Meeting, New Orleans, LA, 12/1/2018; revised abstract with multivariate pattern analysis submitted to 2019 Human Brain Mapping meeting. Manuscript in prep*

## INVITED TALKS

- Symposium speaker, Towards a Science of Consciousness, Tucson, Arizona, USA, May 2006
- KUL Algology Course, Spa, Belgium, October 2006
- Belgian Neurological Society Meeting, Genval, Belgium, November 2006
- KUL Winter Symposium – Update in Anesthesiology, Intensive Care Medicine, Emergency Medicine and Anesthesiology, Leuven, Belgium, January 2007
- Séminaire de perfectionnement en Neurologie, Société de Réanimation de Langue Française, March 2007
- Cambridge VS and MCS symposium, Cambridge, UK, September 2007
- European Federation of Neuropsychiatry Meeting, Florence, Italy, November 2007
- Hellenic Neuroscience Society, Thessaloniki, Greece, November 2007

- Portuguese Neurological Society, Luso, Portugal, May 2008
- 2<sup>nd</sup> International Conference on Coma & Vegetative State, Berlin, Germany, June 2009
- Euroneuro conference, Porto, Portugal, February 2010
- Featured lecture, Charité Neurological Institute, Berlin, Germany, February 2010
- Invited lecture at Salzburg University, Austria, April 2010
- Workshop speaker: Connectivity in Disorders of Consciousness, Human Brain Mapping 2010 Conference, Barcelona, Spain, June 2010
- Invited lecture, Neurology Department seminars, St Thomas' Hospital, London, June 2010
- 3<sup>rd</sup> international Coma and Consciousness Conference, Salerno, July 2010
- Faculty, Barcelona Cognition, Brain and Technology summer school, September 2010
- Symposium speaker, Resting-State Functional Connectivity conference, Milwaukee, Wisconsin, USA, September 2010
- Saint Catharine College, University of Cambridge, Professor JD Pickard, November 2010
- Sacré-Coeur Hospital, McGill University, Montreal, Canada, January 2011
- Psychology Department (CERNEC), McGill University, Montreal, Canada, January 2011
- Neural correlates of consciousness and predictive coding (M. Boly – K. Friston – A. Hobson), University College London, March 2011.
- Young Investigator College Seminar, Goethe University, Frankfurt, 26 May 2011
- Faculty, Statistical Parametric Mapping M/EEG course, Institute of Neurology, Queen Square, London, UK, May 2011
- Tutorial speaker, Association for Scientific Study of Consciousness 15<sup>th</sup> Annual Meeting, Kyoto, Japan, June 2011
- Plenary speaker, 8<sup>th</sup> International Symposium on Memory and Awareness in Anesthesia, Milwaukee, USA, June 2011
- Symposium speaker, Towards a Science of Consciousness 2012, Tucson, Arizona, USA, April 2012
- Morning Workshop speaker: Connecting Consciousness and Connectivity - Human Brain Mapping 2012, Beijing, China, June 2012
- Symposium speaker, 16th Conference of the Association for the Scientific Study of Consciousness, Brighton, UK, July 2012
- Speaker, Francis Crick Memorial Conference on Consciousness in Human and Non-Human Animals, Cambridge, UK, July 2012
- Mind Science Foundation Samoset Conference, Maine, USA, July 2012
- Faculty, Dynamic Causal Modeling Paris course, Biomag 2012 Satellite, Paris, France, August 2012
- Symposium speaker, 3rd Biennial Conference on Resting State Brain Connectivity, Magdeburg, Germany, September 2012
- Speaker, Mini-symposium on Neural Correlates of Consciousness, Society for Neuroscience Meeting 2012, New Orleans, USA, October 2012
- Keynote speaker, NeuroCog 2012 Conference, Ghent, Belgium, December 2012
- Panel speaker, The Whispering Mind: The Enduring Conundrum of Consciousness; World Science Festival, New York City, June 2013
- Brain Connectivity Workshop speaker, Vancouver, Canada, June 2013
- Consciousness Symposium speaker, Cognitive Neuroscience Society, Boston, USA, April 2014
- Speaker, Borderline States of Consciousness Bioethics Symposium, New York University, USA, October 2014

- Tutorial Speaker on Integrated Information Theory of Consciousness, Association for the Scientific Study of Consciousness 20<sup>th</sup> Annual Meeting, Buenos Aires, Argentina, June 2016
- Plenary Symposium speaker, Association for Scientific Study of Consciousness 20<sup>th</sup> Annual Meeting, Buenos Aires, Argentina, June 2016
- Altered States of Consciousness LOC Plenary Symposium speaker, Human Brain Mapping 2016, Geneva, Switzerland, June 2016
- Gordon conference speaker: Neural Circuits for Perception, Memory, Thought and Consciousness, Maine, USA, July 2016
- Faculty, Neuroscience School of Advanced Studies on Consciousness, Cortona, Italy, September 2016
- Pre-Meeting Symposium speaker: The Neuroscience of Consciousness and Coma, American Neurological Association, Baltimore, USA, October 2016
- Invited seminar, NYU Electrophysiology Research Group, New York, December 2016
- Invited seminar, Yale Epilepsy Department, December 2016
- Invited seminar, Mayo Clinic Transcranial Magnetic Stimulation group, January 2017
- Competence Network Stroke symposium, Arbeitstagung NeuroIntensiv Medizin ANIM, Vienna, February 2017
- Invited seminar, Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany, February 2017
- Keynote Speaker, National Capital Area TBI Research Symposium, NIH campus, March 2017
- Speaker, Yale Epilepsy Retreat, Connecticut, March 2017
- Keynote Speaker, Basic and Clinical Imaging conference, Switzerland, August 2017
- Speaker, Joint Bioethics Colloquium, NIH Department of Bioethics, September 2017
- Speaker, Mind Science Foundation meeting on "Emerging Technologies and the Future of Being Human", San Antonio, October 2017
- Speaker, Brain Imaging Center Symposium at Mount Sinai, New York, October 2017
- Symposium Co-Chair and Speaker, Neuroscience 2017, Washington D.C., November 2017
- Invited Speaker, Neuroscience in Intensive Care International Symposium-America, Washington DC, March 2018
- Invited Speaker, Yale MRRC seminar, March 2018
- Tutorial Speaker, Association for Scientific Study of Consciousness 22<sup>th</sup> Annual Meeting, Krakow, Poland, June 2018
- Keynote Speaker, Association for Scientific Study of Consciousness 22<sup>th</sup> Annual Meeting, Krakow, Poland, June 2018
- Invited Faculty, Neuroscience School of Advanced Studies on Consciousness, Venice, Italy, July 2018
- Invited presentation, Templeton World Charity Foundation Diverse Intelligences meeting, St Andrews, Scotland, July 2018
- Invited Speaker, Neurointensive care SIG, American Neurological Association meeting, Atlanta, GA, October 2018
- Invited talk, Yale Epilepsy Retreat, Old Saybrook, CT, October 2018
- Invited speaker, Symposium "From Mind-wandering to Mindfulness: The Role of Attention and Awareness" at the NIH, March 2018
- Invited Speaker, Neuroscience in Intensive Care International Symposium-America, Washington DC, March 2019
- Invited Speaker, Northern California Consciousness Conference, UC Davis, March 2019



- Invited seminar, Liverpool John Moores University, Liverpool, UK, April 2019
- Symposium Speaker: Impaired Consciousness in Epilepsy, 33rd International Epilepsy Congress (ILAE), Thailand, June 2019

## TECHNICAL SKILLS

*Neuroimaging modalities:* FDG and H2O PET, resting state and block/event-related fMRI, high density EEG (& source reconstruction), TMS-EEG, EEG-fMRI, DTI, intracranial EEG recordings  
*Neuroimaging Data Analysis Software:* SPM for PET/fMRI and M/EEG, including DCM; FSL (MELODIC, TBSS-PROBTRACK), Brain Voyager, EEGLab, EGI Net Station Tools and Geosource, FASST, SSP, Brainstorm. *Computer Programming Skills:* Matlab, UNIX SH shell, Python (basic), Cogent

## POST-GRADUATE COURSES

- 2006: Multi-modal Functional Neuroimaging Meeting, Cortona, Italy
- 2006: MEG/EEG course, Human Brain Mapping Conference, Florence, Italy
- 2006: FSL & Freesurfer course, Siena, Italy
- 2006: SMART course, Royal Hospital for Neuro-disability, London, UK
- 2007: Statistical Parametric Mapping Short Course, May 2007, UCL, London, UK
- 2008: Advanced fMRI Course, Human Brain Mapping Conference, Melbourne, Australia
- 2008: Advanced BrainVoyager fMRI course, Koln, Germany
- 2009: Clinical EEG course, Interuniversity cursus, Nancy, France
- 2009: BrainVoyager Data Processing Course, Maastricht, The Netherlands
- 2009: Brain Connectivity Workshop, Maastricht, The Netherlands
- 2010: Statistical Parametric Mapping MEEG course, June 2010, London, UK
- 2010: Brain Connectivity Workshop, Berlin, Germany
- 2010: Dynamical Systems in Neuroscience course, Human Brain Mapping, Barcelona
- 2011: Statistical Parametric Mapping M/EEG course, May 2011, UCL, London, UK
- 2015: Pattern Recognition for Neuroimaging course, Human Brain Mapping, Hawaii
- 2016: Anatomy & real-time fMRI courses, Human Brain Mapping, Geneva, Switzerland
- 2018: Gordon Research Seminar on Mechanisms of Epilepsy, Mount Snow, VT
- 2018: Human Single Neuron conference, Caltech, USA

## ACTIVE RESEARCH SUPPORT

Templeton World Charity Foundation TWCF0265 (12/28/17-6/30/20)      \$199,990  
 Boly Melanie (PI)  
 Diverse intelligences: Information processing and pure consciousness

## COMPLETED RESEARCH SUPPORT

NINDS 1R03NS096379 (09/15/16-08/31/18)      \$100,000  
 Boly, Melanie (PI)  
 Characterizing epileptic spikes as travelling waves using high-density EEG

Tom Slick Award, Mind Science Foundation  
07/01/13-07/01/15  
Boly, Melanie (PI)

Doctoral & Postdoctoral Fellowship, Belgian National Fund for Scientific Research  
09/01/05-06/16/13  
Boly, Melanie (FEL)

Postdoctoral Research Award, Belgian American Educational Foundation  
09/01/11-09/01/12  
Boly, Melanie (PDC)

Research Travel Award, Fondation Leon Fredericq, Liege, Belgium  
09/01/09-09/01/11  
Boly, Melanie (PDC)