Áine Byrne

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Education			
Ph.D. Mathematical Scien	nces, University of Notting	ham, UK. 2013 -	- 2017
Thesis: "Next generation microscopic brain scales".	neural activity models: Bridg	ging the gap between mesoscop	pic and
Supervisor: Prof. Stephen	Coombes.		
B.A. (Mod) Theoretical F Graduated with 1st Class	Physics, Trinity College Dul Honours.	blin, Ireland. 2009 -	- 2013
Research Experient	CE		
Postdoctoral Research Fei Center for Neural Science, Ne	llow w York University, USA.	2017-р	resent
Ph.D. Student		2013	-2017
School of Mathematical Scien	ces, University of Nottingham,	UK.	
Research Scholar Materials Research Laborator	y, University of California Sant	Summe ta Barbara, USA.	er 2012

EXPERTISE AND INTERESTS

- Mathematical and computational neuroscience, dynamical systems, bifurcation theory, mean field theory, neuroimaging, psychophysics.
- Proficient in MATLAB, XPP, AUTO, R, LaTeX, Python and C++.
- Experience running magnetoencephalography (MEG) and psychophysics experiments.

HONOURS AND AWARDS

Swartz Fellowship, New York University	2017 - 2019
Vice Chancellor's Scholarship for Research Excellence, University of Nottingham	2013 - 2017
Trinity Foundation Scholarship, Trinity College Dublin	2012 - 2017
Poster prize at Dynamics of Complex Systems, University of Warwick	May 2016
Andrew Hendry Postgraduate Prize, University of Nottingham	Apr 2016
CISEI summer research grant, University of California Santa Barbara	June 2012

Publications

- Á. Byrne, M.J. Brookes, S. Coombes. A mean field model for movement induced changes in the beta rhythm, *Journal of Computational Neuroscience*, Vol 43, 143-158 (2017)
- P. Tewarie, B.A.E. Hunt, G.C. O'Neill, Á. Byrne, K. Aquino, M. Bauer, K.J. Mullinger, S. Coombes, M.J. Brookes. Relationships Between Neuronal Oscillatory Amplitude and Dynamic Functional Connectivity. *Cerebral Cortex*, bhy136 (2018).
- S. Coombes, Á. Byrne. Next generation neural mass models. In Lecture Notes in Nonlinear Dynamics in Computational Neuroscience: from Physics and Biology to ICT, edited by Torcini A, Corinto F, PoliTO. Springer (2019).
- Á. Byrne, D. Avitabile, S. Coombes. A next generation neural field model: The evolution of synchrony within patterns and waves. *Physical Review E*, Vol 99, 012313 (2019).
- P. Tewarie, R. Abeysuriya, Á. Byrne, G.C. O'Neill, S.N. Sotiropoulos, M.J. Brookes, S. Coombes. How do spatially distinct frequency specific MEG networks emerge from one underlying structural connectome? The role of structural eigenmodes, *NeuroImage*, Vol 186, 211-220 (2019).
- Á. Byrne, S. Coombes, P.F. Liddle. A neural mass model for abnormal beta-rebound in schizophrenia. In *Handbook of Multi-scale Models of Brain Disorders*, edited by V Cutsuridis, Springer (2019)
- A. Bose, **Á. Byrne**, J. Rinzel. A neuromechanistic model for rhythmic beat generation. *PLoS Computational Biology*, in press.
- S. Keeley, **Á. Byrne**, A. Fenton, J. Rinzel. A rate-model framework for the gamma oscillation. *Journal of Neurophysiology*, in press.
- Á. Byrne, R. O'Dea, M. Forrester, J. Ross, S. Coombes. Next generation neural field modelling: Invited review. *Journal of Neurophysiology*, in prep.

Select Talks and poster presentations

Finding the beat: A neuromechanistic model for rhythmic beat generation <i>Neuroscience 2018</i> , San Diego, California, USA.	Nov 2018
A neuromechanisic model for beat generation Annual Computational Neuroscience Meeting, Seattle, WA, USA.	July 2018
Next generation neural activity models. Biomathematics/Computational Biology Colloquium, Courant Institute, NYU, NY, USA	Feb 2018
A parsimonious model for event related synchronisation and desynchronisation. Mathematical Biology Seminar Series, New Jersey IT, NJ, USA.	Nov 2017
A next generation neural field model. SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, USA.	May 2017
The evolution of synchrony within patterns and waves. Mathematical Dynamics Seminar, University of Exeter, UK.	Jan 2017

A mean field model for event-related synchronisation and desynchronisation. European Conference on Mathematical and Theoretical Biology, University of Nottingha	July 2016 am, UK.
Next generation neural mass models. 2nd International Conference on Mathematical NeuroScience, Antibes, France.	June 2016
A mean field model for the evolution of synchrony. Mathematics in Life Sciences (MiLS) meeting, University of Nottingham, UK.	June 2016
Next generation neural mass modelling. The Dynamics of Complex Systems, University of Warwick, UK.	May 2016
Mathematics for mental health SET for Britain, House of Commons, London, UK.	Mar 2016
Modelling cortical beta rebound. Mathematical Methods in Systems Biology, University College Dublin, Ireland.	July 2015
Using mathematics to understand the brain Link'15, University of Nottingham, UK.	July 2015
Next generation neural mass models: rate and coherence. 1st International Conference on Mathematical NeuroScience, Antibes, France.	June 2015
Workshops	
Future frameworks in Theoretical Neuroscience. San Antonio, Texas	Feb 2019
Complex Systems in Neuroscience: Bridging Theory and Experiment. University of Pittsburgh, PA, US.	Mar 2017
Generalized Network Structures and Dynamics. Mathematical Biosciences Institute, Ohio State, US.	Mar 2016
Dynamics of Coupled Oscillators: 40 Years of the Kuramoto Model. Max Planck Institute for the Physics of Complex Systems, Dresden, Germany.	July 2015

CONFERENCE ORGANISATION

- Workshop organiser at Annual Computational Neuroscience Meeting, June 2018.
- Organised mini-symposium for SIAM Conference on Applications of Dynamical Systems, May 2017.
- Member of the organising committee for *Link'15*, July 2015.

TEACHING EXPERIENCE

Research Advisor for Undergraduate Students	2017 - present
Instructor	
Introduction to Neural Data Analysis	2019 - present
Introduction to Quantitative Research	2014 - 2017
Mathematics for Engineering STEM tutorials	2015 - 2016
Teaching Assistant	
Analytical and Computational Foundations I	2013 - 2016
Calculus I	2013 - 2016
Linear Mathematics I	2013 - 2016
Optimization	2014 - 2016

PROFESSIONAL MEMBERSHIP

Society for Industrial and Applied Mathematics (SIAM) Organization for Computational Neurosciences (OCNS) Society for Neuroscience (SfN) New York Academy of Science (NYAS)

Additional information

- Mentor for the 1000 Girls, 1000 Futures New York Academy of Science program.
- Volunteer at science fairs, after-school homework club, playgroup for autistic children and computer skills course for the elderly.
- Organised Women in Maths seminar series and bi-weekly tea breaks during PhD.
- Postgraduate course rep and MAGIC node officer (2015-2017).
- Active member of Manhattan Gaels GAA, as both player and public relations officer.