

Ernst Strüngmann Institute for Neuroscience in Cooperation with Max Planck Society
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Research Statement

Neural activity is not only driven by external factors such as sensory stimuli, but to a large extent generated spontaneously. This spontaneous brain activity displays a coherent spatio-temporal structure and interacts with stimulus-driven activity in complex ways. I study spontaneous brain activity and its effect on cognition and behaviour using a variety of techniques, ranging from fMRI in humans and primates, and *in vivo* electrophysiology in rodents, cats, and primates, to computational modelling.

Academic Positions and Education

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| 2019 – present | Max Planck Research Group Leader Ernst Strüngmann Institute for Neuroscience, Frankfurt am Main, Germany |
| 2014 - 2019 | Postdoctoral research associate with Pascal Fries Ernst Strüngmann Institute for Neuroscience, Frankfurt am Main, Germany |
| 2011 - 2014 | HFSP postdoctoral fellow with Pascal Fries Project: <i>The role of spontaneous brain activity in stimulus processing and behaviour</i> Ernst Strüngmann Institute for Neuroscience, Frankfurt am Main, Germany |
| 2009 - 2011 | Postdoctoral research associate with Matteo Carandini Project: <i>Trial-to-trial variability in mouse visual cortex</i> University College London, London, United Kingdom |
| 2005 - 2009 | Wellcome Trust 4 Year PhD programme in Neuroscience Supervisors: Geraint Rees and Karl Friston Thesis title: <i>Spontaneous fMRI activity in human visual cortex</i> University College London, London, United Kingdom |
| 2008 | Research rotation with David Leopold, as part of Ph.D. National Institute of Mental Health, Bethesda, United States |
| 2004 - 2005 | Research assistant with Peter Hagoort Donders Centre for Cognitive Neuroimaging, Nijmegen, Netherlands |
| 2002 - 2004 | M.Sc. in Neuroscience and Cognition Graduated cum laude Included research at the Institute of Cognitive Neuroscience, UCL, UK Utrecht University, Utrecht, Netherlands |

1999 - 2002 B.Sc. (Hons); major in life sciences
Graduated summa cum laude
University College Utrecht, Utrecht, Netherlands

Research Grants and Scholarships

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| 2011 - 2014 | Long-term fellowship from Human Frontiers Science Programme | € 143,700 |
| 2005 - 2009 | 4-year PhD Neuroscience Wellcome Trust Studentship | £ 126,000 |
| 2010 | Brain Travel Grant for attendance of Cold Spring Harbor course | £ 1,000 |
| 2010 | Bogue Fellowship for attendance of Cold Spring Harbor course | £ 1,000 |
| 2008 | Bogue Fellowship for working at National Institute of Mental Health | £ 8,000 |
| 2004 | Dutch Brain Society and NVN support for MSc project at UCL | € 1,500 |

Honours and Awards

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| 2018 – 2019 | Women in Science Award from Christiane Nüsslein-Volhard Stiftung |
| 2014 - 2016 | Main Campus Educator grant from Polytechnische Gesellschaft Frankfurt |
| 2011 | ‘best neuroscience thesis of the year’ by British Neuroscience Association |
| 2009 | First prize for best Functional Imaging poster at ISMRM |
| 2009 | Prize for best poster at Wellcome Trust PhD student meeting |

Teaching, Courses and Outreach

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| 2020 | Co-organise symposium ‘Neuronal variability’ at conference FENS, Glasgow, UK |
| 2019 | Faculty position at International Max Planck Research School for Neural Circuits |
| 2019 | Gave 8-hr lecture series on fMRI to Master and PhD students as part of Grade Brain |
| 2018 | Co-organised symposium at conference Psychologie & Gehirn, Giessen, Germany |
| 2017 | Wrote essays for the HFSP website summarising my research for the general public |
| 2015 | Lectures on career paths in neuroscience at University College Utrecht |
| 2013 | Organised conference ‘Inter-areal interactions’ at Ernst Strüngmann Institute |
| 2012 | Organised yearly retreat of Ernst Strüngmann Institute |
| 2010 | Computational Vision course at Cold Spring Harbor Laboratory |
| 2010, 2005 | Animal Care and Handling, Animals Scientific Procedure Act 1986 |
| 2008 – 2009 | Lecturer in Matlab for Cognitive Neuroscience course, UCL, London |
| 2006 – 2008 | Lecturer in Methods for Dummies course, Wellcome Trust Centre for Neuroimaging |

Academic Supervision

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|----------------|------------------------------|
| 2015 – 2016 | Georgios Spyropoulos, Ph.D. |
| 2015 – 2018 | Alina Peter, Ph.D. |
| 2012 – present | Jarrod Dowdall, Ph.D. |
| 2012 | Katharine Shapcott, rotation |

2011 Jianguang Ni, rotation
2009 Mark Smith, M.Sc.

Invited Talks

assistant professor / junior group position: * shortlisted, ** job offer

2019 Institut de Sciences Cognitives, Lyon
** Ernst Strüngmann Institute for Neuroscience, Frankfurt

2018 * Donders Centre for Cognitive Neuroimaging, Nijmegen
Psychology Department, Katholieke Universiteit Leuven, Leuven
Departmental seminar, University of Oxford, Oxford
Symposium on brain states, Psychologie und Gehirn, Giessen
* Donders Centre for Cognitive Neuroimaging, Nijmegen
* Cognitive Psychology Department, Vrije Universiteit, Amsterdam
* Department of Neurosciences, Katholieke Universiteit Leuven, Leuven
** European Neuroscience Institute, Göttingen

2017 * Donders Centre for Cognitive Neuroimaging, Nijmegen
Translational Neuroscience Unit, Donders Institute, Nijmegen

2015 Psychology Department, University of Utrecht, Utrecht
Laboratoire Psychologie de la Perception, Paris
CCNi Debate on Spontaneous brain activity, University of Glasgow, Glasgow

2011 MRC Cognition and Brain Sciences Unit, Cambridge
Forschungszentrum Jülich, Jülich
Symposium on spontaneous activity and visual perception, ECVF, Toulouse
Departmental seminar, University of Oxford, Oxford
Departmental seminar, Imperial College London, London

2010 Departmental seminar, Wellcome Trust Centre for Neuroimaging, London

2009 Max Planck Institute for Brain Research, Frankfurt
Departmental seminar, Neurospin, Paris
Netherlands Institute for Neuroscience, Amsterdam

2008 European Conference on Visual Perception, Utrecht

2007 Gatsby Computational Neuroscience Unit, London

2003 EndoNeuroPsycho conference, Doorwerth

Selected Conference Presentations

Local

Primate Neurobiology Meeting: Göttingen 2017, Göttingen 2013, Tübingen 2012
Queen Square Symposium: London 2007
EndoNeuroPsycho conference: Doorwerth 2003

International

SfN: San Diego 2018, Washington 2015, Washington 2011, San Diego 2010, Washington 2008

FENS: Berlin 2018, Vienna 2006

Cosyne: Salt Lake City 2017

ECVP: Bremen 2013, Toulouse 2011, Utrecht 2008

Conference on Resting State and Brain Connectivity: Magdeburg 2013, Milwaukee 2010

HBM: San Francisco 2009

ISMRM: Hawaii 2009

VSS: Naples, Florida 2008

Reviewer

Nature Communications

Communications Biology

Journal of Neuroscience

Journal of Neurophysiology

NeuroImage

Human Brain Mapping

Frontiers in Human Neuroscience

Frontiers in Systems Neuroscience

Brain Connectivity

Brain Topography

Brain and Behavior

Developmental Cognitive Neuroscience

Hersenstichting

Journal Publications

‡ indicates equal contribution

H-index: 16, citations: 2001 (google scholar)

1. Havenith MN[‡], **Schölvinck ML[‡]**, Reid C, Hausser M, Tiesinga P[‡], Fries P[‡] (in preparation) The brain does not average: Testing the behavioural relevance of average neuronal responses in cats, mice and monkeys.
2. **Schölvinck ML**, Dowdall JR, Fiedler E, Stieglitz T, Fries P (in preparation) Spontaneous fluctuations in inter-areal synchronization during a divided attention paradigm.
3. Dowdall JR, **Schölvinck ML**, Zhang Y, Vezoli J, Fries P (in preparation) Visual selective attention is initially biased to fixated objects as reflected in V1 firing rates.
4. Peter A, Dowdall JR, Klein L, **Schölvinck ML**, Schmiedt J, Fries P (in preparation) Repetition of natural images decreases firing rates and can increase gamma synchronization in V1.
5. Vnencak M, **Schölvinck ML**, Deller T, Willem M, Jedlicka P (2019) Lack of β -amyloid cleaving enzyme-1 (BACE1) affects granule cell and network excitability, oscillatory activity and synaptic plasticity in the dentate gyrus in vivo. **Brain Structure and Function** 224 (3): 1279-1290

6. Liu X, De Zwart JA, **Schölvinck ML**, Chang C, Ye FQ, Leopold DA, Duyn JH (2018) Subcortical evidence for a contribution of arousal to fMRI measures of brain activity. **Nature Communications** 9(395): 1-10
7. **Schölvinck ML**[‡], Händel FB[‡] (in press) The brain during free movement – what can we learn from the animal model. *invited review*. **Brain Research**
8. Chang C, Leopold DA, **Schölvinck ML**, Mandelkow H, Liu X, Ye FQ, Duyn JH (2016) Tracking brain arousal fluctuations with fMRI. **PNAS** 113(16): 4518-4523
9. **Schölvinck ML**[‡], Genç E[‡], Bergmann J, Singer W, Kohler A (2016) Functional connectivity patterns of visual cortex reflect its anatomical organization. **Cerebral Cortex** 26: 3719-3731
10. **Schölvinck ML**, Saleem A, Benucci A, Harris KD, Carandini M (2015) Cortical state determines global variability and correlations in visual cortex. **Journal of Neuroscience** 35: 170-178
cited 141 times: within top 1% of most highly cited papers in Neuroscience & Behaviour (Web of Science) discussed in two Journal Clubs in following issues of Journal of Neuroscience
11. Ayaz A, Saleem AB, **Schölvinck ML**, Carandini M (2013) Locomotion Controls Spatial Integration in Mouse Visual Cortex. **Current Biology** 23: 890–894
12. **Schölvinck ML**, Leopold DA, Brookes MJ, Khader PH (2013) The contribution of electrophysiology to functional connectivity mapping. *invited review*. **NeuroImage** 80: 297-306
13. **Schölvinck ML**, Friston KJ, Rees G (2012) The influence of spontaneous activity on stimulus processing in primary visual cortex. **NeuroImage** 59: 2700-2708
14. Busse L, Ayaz A, Dhruv N, Katzner S, Saleem A, **Schölvinck ML**, Zaharia A, Carandini M (2011) The detection of visual contrast in the behaving mouse. **Journal of Neuroscience** 31(31): 11351-11361
15. **Schölvinck ML**, Maier A, Ye FQ, Duyn JH, Leopold DA (2010) Neural basis of global resting-state fMRI activity. **PNAS** 107(22): 10238-10243
cited 625 times: within top 1% of most highly cited papers in Neuroscience & Behaviour (Web of Science) mentioned on front cover, in 'In this Issue', and received a commentary in following issue of PNAS
16. **Schölvinck ML**, Rees G (2009) Neural correlates of motion-induced blindness in the human brain. **Journal of Cognitive Neuroscience** 22(6): 1235-1243
17. **Schölvinck ML**, Rees G (2009) Attentional influences on the dynamics of motion-induced blindness. **Journal of Vision**, 9(1): 38, 1-9
18. **Schölvinck ML**, Howarth C, Attwell D (2008) The cortical energy needed for conscious perception. **NeuroImage** 40(4): 1460-1468
19. Van der Lubbe RHJ, **Schölvinck ML**, Postma A (2006) Divergence of Categorical and Coordinate Spatial Processing assessed with ERPs. **Neuropsychologia** 44(9): 1547-1559
20. Simons JS, **Schölvinck ML**, Gilbert SJ, Frith CD, Burgess PW (2006) Differential components of prospective memory? Evidence from fMRI. **Neuropsychologia** 44(8): 1388-1397
21. Neggers SFW, **Schölvinck ML**, Van der Lubbe RHJ, Postma A (2005) Quantifying the interactions between allo- and egocentric representations of space. **Acta Psychologica** 118: 25-45