

Bernhard Englitz, Ph.D.

Department for Neurophysiology
Donders Institute for Brain, Cognition and Behaviour
Huygens Building, Faculty of Science
Heyendaalseweg 135, 6525 AJ Nijmegen, The Netherlands
@: b.englitz@science.ru.nl
www: englitz.de

Curriculum Vitae

Research Experience

- 06/14–curr.** ➤ **Assistant Professor in Behavioral Computational Neuroscience @ Institute for Neurophysiology, Donders Institute for Neuroscience, Nijmegen, The Netherlands.**
- 10/12–05/14** ➤ **Senior Post-Doctorate in Behavioral Computational Neuroscience @ École Normale Supérieure, Paris (Prof. Shamma).** In charge of scientific supervision of several research projects (1 PostDoc, 1 Ph.D. Student, 2 Master Students) and the establishment of a new computational behavioral physiology laboratory (Budget : €3.3M).
- 01/10–09/12** ➤ **Post-Doctorate in Computational Neuroscience @ UMD Coll. Park, (Prof. Shamma)**
Topic : Decoding directional percepts from neuronal population activity
- 05/05–11/09** ➤ **Ph.D. in Computational Neuroscience @ MPI for Math. in the Sciences (Prof. Jost)**
Topic : Modeling of synaptic transmission & signal representation in the brainstem
- 09/04–04/05** ➤ **Diploma Thesis in Mathematics @ MPI for Math. in the Sciences (Prof. Jost)**
Topic : Analysis and modeling of the irregular firing of cortical interneurons
- 09/01–04/03** ➤ **Computational Neurobiology @ Salk Institute & UC San Diego (Prof. Sejnowski)**
- 09/00–07/01** ➤ **Neuroinformatics @ Institute for Neuroinformatics, ETH Zürich (Dr. König)**
Topic : Neuronal processing and learning under naturally correlated input conditions
- 08/00** ➤ **Neuropsychology @ Max Planck Institute for Psychology (Prof. Goschke)**

Education

- 09/02–04/05** ➤ **Diploma in Mathematics at the MPI for Math. in the Sciences, Leipzig, Germany**
- 09/01–07/02** ➤ **Graduate Program Theoretical Neurobiology at the UC San Diego, USA**
- 09/00–08/01** ➤ **Guest Program in Mathematics at the ETH Zurich, Switzerland**
- 04/99–08/01** ➤ **B.Sc. in Cognitive Science at the U. Osnabrück, Germany**
➤ **B.Sc. in Mathematics at the U. Osnabrück, Germany**

Scholarships & Prizes

- 01/10–12/11** ➤ **Research stipend of the German Research Foundation (DFG)**
- 11/09** ➤ **Dissertation prize of the Research Academy Leipzig**
- 09/01–08/02** ➤ **Fulbright scholarship**
- 09/98–05/04** ➤ **Stipend of the German National Merit Foundation (Studienstiftung des dt. Volkes)**
- 07/99** ➤ **Study award by the Riedel-de-Haan Scholarship Foundation**

Grant Support

- 02/14 (in review) > NSF-ANR Computational Neuroscience (co-PI, Budget : €1.25M)
Topic : *Adaptive Cortical Architectures for Invariant Speech Processing*
- 01/10–12/11 > Research fellowship of the German Research Foundation (DFG)
- 08/01–07/02 > Fulbright scholarship

Teaching

- 03/14 > **Maître de Conference** in Neuroscience (french assistant professor teaching license)
- 01/11 > **Probability Theory** as part of Prof. Shamma's class at the U. Maryland, College Park
- 02/01 > **Neuroinformatics** as part of Prof. Douglas' class at the ETH Zurich

Supervision

- 02/13–05/14 > **Y. Boubenec** (Post Doc) at the ENS, Paris
Topic : *Probabilistic population representation of auditory textures*
- 08/13–05/14 > **J. Lawlor-Blondel** (Master Student) at the ENS, Paris
Topic : *Human perception of changes in sound statistics*
- 07/13–10/13 > **M. Laroche** (Master Student) at the ENS, Paris
Topic : *Relation of single tone to Shepard tone tuning*
- 01/11–09/12 > **S. Akram** (Grad. Student) at the U. Maryland (PI: Prof. Shamma)
Topic : *Correlates of streaming and ambiguous stimuli in magnetoencephalophy*
- 06/08–01/10 > **M. Sonntag** (Graduate, Summa Cum Laude) at the U. Leipzig (PI: Prof. Rübsamen)
Topic : *Development of synaptic transmission at the Calyx of Held*
- 05/07–01/10 > **M. Typlt** (Graduate, Magna Cum Laude) at the U. Leipzig (PI: Prof. Rübsamen)
Topic : *Synaptic transmission at the synapses of Held in the auditory brainstem*
- 06/05–05/08 > **S. Tolnai** (Graduate, Summa Cum Laude) at the U. Leipzig (PI: Prof. Rübsamen)
Topic : *Reliability of transmission at the Calyx of Held in the auditory brainstem*

Skills

Mathematics & Computational Neuroscience

- > Systems analysis and modeling using linear, multilinear & nonlinear methods
- > Computational & statistical analysis of large data sets
- > Decoding of neural population responses
- > Biophysical modeling, partial differential equations & stochastic processes
- > Nonlinear Time-Series Analysis for biological time-series data
- > Finite element modeling for biophysical simulation and numerical PDE solution

Experimental Neuroscience

- > Many-channel, chronic recordings in behaving animals
- > Design & implementation of recording software & hardware
- > Design, implementation & administration of a physiology laboratory

Informatics Tools

- > MATLAB, C/C++. Extensive experience in data analysis, data acquisition, simulation & GUI.
- > NEURON simulator for biophysics of single neurons
- > Design & 3D printing of research material
- > Operating Systems : Linux, Mac OS X, Windows

Skills (cont.)

Languages

- **German** (native)
- **English** (business fluent),
- **French** (fluent)

Publications

Peer Reviewed (7 first, 8 middle author, * = joint first author)

- **Englitz, B.**, David, S. V, Sorenson, M. D., & Shamma, S. a. (2013). MANTA-an open-source, high density electrophysiology recording suite for MATLAB. *Frontiers in neural circuits*, 7, 69.
- Stiefel, K. M., **Englitz, B.**, Sejnowski, T. J. (2013). Origin of intrinsic irregular firing in cortical interneurons. *Proceedings of the National Academy of Sciences of the United States of America*, 110, 7886-91.
- **Englitz, B.**, Akram, S., David, S. V, Chambers, C., Pressnitzer, D., Depireux, D., Fritz J., Shamma, S. A. (2013). Putting the tritone paradox into context: insights from neural population decoding and human psychophysics. *Advances in experimental medicine and biology*, 787, 157-64.
- Stevenson, I. H., London, B. M., Oby, E. R., Sachs, N. A., Reimer, J., **Englitz, B.**, Kording, K. P. (2012). *Functional connectivity and tuning curves in populations of simultaneously recorded neurons*. PLoS computational biology, 8, e1002775.
- Typlt, M., **Englitz, B.**, Sonntag, M., Dehmel, S., Kopp-Scheinpflug, C., Ruebsamen, R. (2012). Multidimensional characterization and differentiation of neurons in the anteroventral cochlear nucleus. *PLoS ONE*, 7, e29965.
- Sonntag, M.*, **Englitz, B.***, Typlt, M., Rübsamen, R. (2011). The calyx of held develops adult-like dynamics and reliability by hearing onset in the mouse in vivo. *The Journal of neuroscience*, 31, 6699-709.
- **Englitz, B.***, Ahrens, M.*, Tolnai, S., Rübsamen, R., Sahani, M., Jost, J. (2010). Multilinear models of single cell responses in the medial nucleus of the trapezoid body. *Network*, 21, 91-124.
- Typlt, M., Hausteiner, M. D., Dietz, B., Steinert, J. R., Witte, M., **Englitz, B.**, Milenkovic, I., Kopp-Scheinpflug, C, Forsythe, I., Rübsamen, R. (2010). Presynaptic and postsynaptic origin of multicomponent extracellular waveforms at the endbulb of Held-spherical bushy cell synapse. *The European journal of neuroscience*, 31, 1574-81.
- Sonntag, M., **Englitz, B.**, Kopp-Scheinpflug, C., Rübsamen, R. (2009). Early postnatal development of spontaneous and acoustically evoked discharge activity of principal cells of the medial nucleus of the trapezoid body: an in vivo study in mice. *The Journal of neuroscience*, 29, 9510-20.
- Tolnai, S.*, **Englitz, B.***, Scholbach, J., Jost, J., Rübsamen, R. (2009). Spike transmission delay at the calyx of Held in vivo: rate dependence, phenomenological modeling, and relevance for sound localization. *Journal of neurophysiology*, 102, 1206-17.
- **Englitz, B.**, Tolnai, S., Typlt, M., Jost, J., Rübsamen, R. (2009). Reliability of synaptic transmission at the synapses of Held in vivo under acoustic stimulation. *PLoS ONE*, 4, e7014.

Publications (cont.)

- Tolnai, S., Hernandez, O., Englitz, B., RübSamen, R., Malmierca, M. S. (2008). The medial nucleus of the trapezoid body in rat: spectral and temporal properties vary with anatomical location of the units. *The European journal of neuroscience*, 27, 2587-98.
- Haustein, M. D., Reinert, T., Warnatsch, A., Englitz, B., Dietz, B., Robitzki, A., RübSamen, R., Milenkovic, I. (2008). Synaptic transmission and short-term plasticity at the calyx of Held synapse revealed by multielectrode array recordings. *Journal of neuroscience methods*, 174, 227-36.
- Tolnai, S., Englitz, B., Kopp-Scheinflug, C., Dehmel, S., Jost, J., RübSamen, R. (2008). Dynamic coupling of excitatory and inhibitory responses in the medial nucleus of the trapezoid body. *The European journal of neuroscience*, 27, 3191-204.
- Englitz, B., Stiefel, K. M., Sejnowski, T. J. (2008). Irregular firing of isolated cortical interneurons in vitro driven by intrinsic stochastic mechanisms. *Neural computation*, 20, 44-64.

Submitted/In Preparation

- Akram, S., Simon J., Elhilali M., Englitz B., Shamma S.A. (submitted to Hearing Research) *Temporal cues and modulation rate interplay with attention to detect a target sound embedded in background noise*, Hearing Research.
- Englitz, B., Akram, S., Depireux, D., Shamma, S., (in submission to Nature Neuroscience) *Decoding the context dependence in the tritone paradox from auditory cortex*
- Akram, S.*, Englitz, B.*, Shamma, S. (in submission to PNAS) *Neuromagnetic correlates of biased perception in the tritone paradox*
- Huang, C.C., Englitz, B., Shamma, S., Rinzel, J. (in prep. for PLoS Comp. Bio.) *Facilitated inhibition biases tritone comparison in a network model.*
- Englitz, B., Depireux, D., David, D., Shamma, S. (in prep. for J. NSci. Methods) *The Array Drive - an open source positioning system for microelectrode arrays.*
- Englitz, B., Stiefel, K., Sejnowski, T. (in prep. for Neural Computation) *Modeling the irregularity of interneuron spiking by stationary moments*
- Englitz, B., Shamma, S. (in prep. for PLoS Comp. Bio.) *Learning the stimulus space geometry & partition from neural population responses*

Invited Lectures

- Closing Symposium of the Graduate School InterNeuro, Leipzig, Germany (2014)
- Seminar at the Donders Institute, Nijmegen, The Netherlands (2014)
- Seminar at the Institutskolloquium at the Institute of Biology, RWTH, Aachen, Germany (2014)
- Seminar at the Edmond & Lily Safra Center for Brain Sciences, Jerusalem, Israel (2013)
- New approaches in neural modeling workshop, Bernstein Conf. Tübingen, Germany (2013)
- Seminar at the Bethge Lab, University of Tübingen, Germany (2013)
- Sensory Systems & Coding Workshop, Math. Biosciences Institute, Columbus, USA (2013)
- Auditorisches Symposium Oldenburg, Germany (2012)
- International Symposium on Hearing, Cambridge, UK (2012)
- Seminar at the Leibniz Institute for Neurobiology, Magdeburg, Germany (2012)
- Auditory Splash, University of Maryland, College Park, USA (2012)
- Salk-OIST Meeting, Salk Institute, La Jolla USA (2007)

Conference Contributions

- COSYNE (2007), ARO (2006-2013), Auditory Cortex Meeting (2009/2012), Society for Neuroscience (2003-13)

Publications (cont.)

Open Source Projects

- High-density Physiology Recording System (MANTA) code.google.com/p/manta-system
- Microdrive for Electrode Arrays for (Array Drive) code.google.com/p/eds-array-drive
- Behavioral and Auditory Physiology Control Software (Baphy) code.google.com/p/baphy