

Prof. Dr. Tobias H. Donner

Professor of Integrative Neuroscience, Deputy Director
Department of Neurophysiology and Pathophysiology
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Professional Appointments

- 2016- Deputy Director, Dept. of Neurophysiology and Pathophysiology, University Medical Center Hamburg (UKE)
- 2015- Professor of Integrative Neuroscience (W3)
Head of Heisenberg-Group *Decision Neuroscience*, UKE
- 2009-15 Assistant Professor, Brain & Cognition Group, Dept. of Psychology, University of Amsterdam (Visiting Professor since 2015)
- 2006-9 Postdoctoral fellow
Computational Neuroimaging Laboratory, Center for Neural Science and Dept. of Psychology, New York University
- 2003-6 Postdoctoral fellow
Dept. of Neurophysiology and Pathophysiology, University Medical Center Hamburg-Eppendorf & Donders Institute for Brain, Cognition and Behaviour, Radboud University Nijmegen

Education

- 2012 BKO-certificate for university teaching in the Netherlands
- 2004 License to practice medicine
- 2003 Doctorate *summa cum laude*, Berlin Neuroimaging Centre, Humboldt-University of Berlin, Charité
Advisors: Stephan A. Brandt, Arno Villringer
- 2003 M.D. (*medizinisches Staatsexamen*), Charité, Berlin

Awards and Honors

- 2015- Heisenberg-Professorship award from German Research Foundation (DFG)
- 2006-8 Postdoc fellowship award from German National Academy of Sciences – Leopoldina
- 2004 Doctoral thesis award from *Berliner Gesellschaft für Psychiatrie und Neurologie*
- 2002-3 Scholarship award from German Academic Exchange Service (*Deutscher Akademischer Auslandsdienst*)
- 1998-02 Scholarship award from German National Merit Foundation (*Studienstiftung des deutschen Volkes*)
- 1997-98 Scholarship award from Graduiertenkolleg 423 “Clinical and Cognitive Neurosciences”, DFG

Past and Present Funding

- Research grant from Federal state of Hamburg. Project title: *Immunological Modulation of Decision Computations in the Human Brain* (2016-18). Role: PI.
- EU Horizon 2020 Marie Curie Individual Fellowship to Konstantinos Tsetsos. Project title: *Cortical Dynamics of Decision Irrationality* (2016-18). Role: Supervisor.
- DFG project grant (A7) in Collaborative Research Centre (SFB) 936. Project title: *Manipulating Adaptive Evidence Accumulation in Cortical Decision Networks* (2015-19). Role: PI.
- DFG Research Project grant. Project title: *The Neural Basis of Sequential Choice Bias in the Human Brain* (2015-18). Role: PI.
- DFG Heisenberg Professorship award. Project title: *Neuromodulation of Cortical Decision Networks* (2015-18; extension planned until 2020). Role: PI.
- NWO Research Talent grant. Project title: *How Does Surprise Alter Internal Brain State and Learning?* (2014-2017; PhD student: Thomas Meindertsma). Role: PI.
- Competitive Calls Programme grant, EU-FP 7 *Human Brain Project*. Project title: *Dissecting the brainstem modulation of cortical decision computations* (2014-16). Role: PI (Co-PI: Andreas K. Engel).
- Project grant of Amsterdam Brain & Cognition Priority Program. Project title: *Noradrenergic Shaping of Cortical Decision Computations* (2014-2016; Co-PI: Cyriel Pennartz)
- Starter project grant, Spinoza Center for Neuroimaging. Project title: *A Novel Signature of Reward in Human Visual Cortex* (2012-2013)
- Brain Imaging grant, Graduate School Neurosciences Amsterdam Rotterdam (ONWAR). Project title: *Dissecting Decision-related Activity in Human Primary Visual Cortex* (2011-2014; Co-PI: Victor A.F. Lamme; PhD student: Niels Kloosterman)
- Postdoctoral fellowship award, German National Academy of Sciences – Leopoldina. Project title: *The Neural Basis of Visual Awareness in Humans: Cortical Interactions Underlying Motion-Induced Blindness* (2006-2008)
- Project grant, *Hans-Lungwitz-Foundation*. Project title: *Dynamics of Attention and Decisions in the Human Visual System* (2003-2005; Co-PI; PI: Andreas K. Engel)

PhD / Postdoc Advisor

- Keno Hagen, MD student, 2017-present
- Ruud van den Brink, Postdoc, 2017-present
- Kobe Desender, Postdoc, 2017-present
- Konstantinos Tsetsos, Postdoc, 2016-present
- Peter Murphy, Postdoc, UKE, 2015-present
- Niklas Wilming, Postdoc, 2015-present
- Bharath Chandra Talluri, PhD student, 2015-present
- Anke Braun, PhD student, 2015-present
- Olympia Colizoli, Postdoc, 2014-present
- Jan Willem de Gee, PhD student, 2014-present
- Thomas Meindertsma PhD student, 2014-present
- Anne Urai, PhD student, 2013-present
- Thomas Pfeiffer, PhD student, 2013-2017; Postdoc, 2017-present
- Niels Kloosterman, PhD student and Postdoc, 2010-2015
- Tomas Knapen, NWO-VENI Postdoc, 2010-2013

- Memberships**
- *Society for Neuroscience*
 - *Organization for Human Brain Mapping*

Service to the Profession Reviewing Editor for *eLife*
Associate Editor for *Frontiers in Decision Neuroscience*

Ad-hoc Reviewer for the following journals:

- *Attention, Perception & Psychophysics*
- *Cerebral Cortex*
- *Consciousness & Cognition*
- *Current Biology*
- *European Journal of Neuroscience*
- *Frontiers in Neuroscience (several sub-disciplines)*
- *Frontiers in Psychology*
- *Journal of Cognitive Neuroscience*
- *Journal of Neuroscience*
- *Journal of Neurophysiology*
- *Journal of Vision*
- *Nature Communications*
- *Nature Human Behaviour*
- *Nature Neuroscience*
- *NeuroImage*
- *Neuron*
- *Neuroreport*
- *Proceedings of the National Academy of Science USA*
- *Psychophysiology*
- *Vision Research*

Ad-hoc Reviewer for the following funding agencies:

- *Alexander von Humboldt Foundation (Germany)*
- *Deutsche Forschungsgemeinschaft (DFG, Germany)*
- *French National Research Agency – ANR*
- *Medical Research Council (MRC, UK)*
- *Wellcome Trust (UK)*
- *Netherlands Organisation for Scientific Research (NWO)*
- *Research Foundation Flanders (FWO)*

Member of several PhD committees (Germany, The Netherlands)

Publications and Talks

Journal Articles

- Pfeffer T, Avramiea AE, Nolte G, Engel AK, Linkenkaer-Hansen K & **Donner TH**. 2017. Catecholamines, not acetylcholine, alter cortical and perceptual dynamics in line with increased excitation-inhibition ratio. *bioRxiv* 170613. doi: <https://doi.org/10.1101/170613>
- Braun A, Urai AE & **Donner TH**. 2017. Confidence-dependent Accumulation of Past Decision Variables Biases Perceptual Choice. *bioRxiv* 172049. doi: <https://doi.org/10.1101/172049>
- Meindertsma T, Kloosterman NA, Nolte G, Engel AK, & **Donner TH**. 2017. Multiple Transient Signals in Human Visual Cortex Associated with an Elementary Decision. *Journal of Neuroscience*. 37: 5744-57.
- de Gee JW, Colizoli O, Kloosterman NA, Knapen T, Nieuwenhuis S & **Donner TH**. 2017. Dynamic modulation of decision biases by brainstem arousal systems. *eLife* 6. pii: e23232. doi: 10.7554/eLife.23232.
- Urai AE, Braun A & **Donner TH**. 2017. Pupil-linked arousal is driven by decision uncertainty and alters serial choice bias. *Nature Communications*. 8:14637. doi: 10.1038/ncomms14637.
- van den Brink RL, Pfeffer T, Warren CW, Murphy PR, Tona K-D, van der Wee NJA, Giltay E, van Noorden MS, Rombouts SAR, **Donner TH*** & Nieuwenhuis S*. (*=Shared senior authorship.) 2016. Catecholaminergic Neuromodulation Shapes Intrinsic MRI Functional Connectivity in the Human Brain. *Journal of Neuroscience*. 36: 7865-76.
- Hebart M, Schriever Y, **Donner TH***, Haynes JD*. (*=Shared senior authorship.) 2016. The Relationship between Perceptual Decision Variables and Confidence in the Human Brain. *Cerebral Cortex*. pii: bhu181.
- Bronfman ZZ, Brezis N, Moran R, Tsetsos K, **Donner T*** & Usher M*. (*=Shared senior authorship.) 2015. Decisions reduce sensitivity to subsequent information. *Proc Biol Sci* 282(1810). pii: 20150228. doi: 10.1098/rspb.2015.0228.
- Tsetsos K, Pfeffer T, Jentgens P & **Donner TH**. 2015. Action Planning and the Timescale of Evidence Accumulation. *PLoS One* 12;10(6): e0129473. doi: 10.1371/journal.pone.0129473.
- Warren CM, Nieuwenhuis S & **Donner TH**. 2015. Perceptual choice boosts network stability: effect of neuromodulation? *Trends in Cognitive Sciences*. 19: 362-4.
- Kloosterman NA, Meindertsma T, van Loon AM, Lamme VAF, Bonnef YS & **Donner TH**. 2015. Pupil Size Tracks Perceptual Content and Surprise. *European Journal of Neuroscience*.
- Kloosterman NA, Meindertsma T, Hillebrand A, van Dijk B, Lamme VAF & **Donner TH**. 2015. Top-Down Modulation in Human Visual Cortex Predicts the Stability of a Perceptual Illusion. *Journal of Neurophysiology* 113: 1063-76.
- Bonnef YS, **Donner TH**, Cooperman A, Heeger DJ & Sagi D. Motion-induced Blindness and Troxler Fading: Common and Different Mechanisms *PLoS One*. 9(3):e92894. doi: 10.1371/journal.pone.0092894.
- De Gee JW, Knapen T & **Donner TH**. 2014. Decision-related Pupil Dilation Reflects Upcoming Choice and Individual Bias. *Proceedings of the National Academy of Sciences USA*. 111: E618-25.
- Cohen MX & **Donner TH**. 2013. Midfrontal Conflict-Related Theta Power Reflects Endogenous Neural Oscillations that Predict Behavior. *Journal of Neurophysiology*. 110: 2752-63.
- **Donner TH** & Nieuwenhuis S. 2013. Brain-wide Gain Modulation: The Rich Get Richer ("News & Views" Commentary). *Nature Neuroscience*. 16: 989-90.

- Ossmy O, Moran O, Pfeffer T, Tsetsos K, Usher M* & **Donner TH*** (*=Shared senior authorship.) 2013. The Timescale of Perceptual Evidence Integration Can Be Adapted to the Environment. *Current Biology* 23: 981-6.
- van Loon AM, Knapen T, Scholte HS, St John-Saaltink E, **Donner TH*** & Lamme VA*. (*=Shared senior authorship.) 2013. GABA Shapes the Dynamics of Bistable Perception. *Current Biology*. 23: 823-7.
- **Donner TH**, Sagi D, Bonnefante YS & Heeger DJ. 2013. Retinotopic Patterns of Correlated Fluctuations in Visual Cortex Reflect the Dynamics of Spontaneous Perceptual Suppression. *Journal of Neuroscience*. 33: 2188-2198.
- de Lange F, Dobromir Rahnev D, **Donner TH***, Lau H*. (*=Shared senior authorship.) 2013. Pre-stimulus Oscillatory Activity over Motor Cortex Reflects Perceptual Expectations. *Journal of Neuroscience*. 33: 1400–1410.
- Honey CJ, Thesen T, **Donner TH**, Silbert L, Carlson CE, Devinsky O, Doyle WK, Rubin NK, Heeger DJ, Hasson U. 2012. Slow Cortical Dynamics and the Accumulation of Information over Long Time Scales. *Neuron*. 76: 423–434.
- Hebart M, **Donner TH***, Haynes JD*. (* = Shared senior authorship.) 2012. Human Visual and Parietal Cortex Encode Visual Choices Independent of Motor Plans. *Neuroimage*. 63: 1393–1403.
- Siegel M*, **Donner TH*** & Engel AK. (* = Shared first authorship.) 2012. Spectral Fingerprints of Large-scale Neuronal Interactions. *Nature Reviews Neuroscience*. 13: 121-34.
- Nieuwenhuis S & **Donner TH**. 2011. The Visual Attention Network Untangled (“News & Views” Commentary). *Nature Neuroscience*. 14: 542-3.
- **Donner TH** & Siegel M. 2011. A Framework for Local Cortical Oscillation Patterns. *Trends in Cognitive Sciences*. 15: 191-199.
- Freeman J, **Donner TH** & Heeger DJ. 2011. Inter-Area Correlations in the Human Ventral Visual Pathway Reflect Feature Integration. *Journal of Vision*. 26. doi: 10.1167/11.4.15.
- Siegel M, Engel AK & **Donner TH**. 2011. Cortical Network Dynamics of Perceptual Decision-Making in Humans. *Frontiers in Neuroscience*. 5: 21. doi: 10.3389/fnhum.2011.00021.
- Bonnefante YS, **Donner TH**, Sagi D, Fried M, Heeger DJ & Arieli A. 2010. Microsaccades and Motion-induced Blindness: Cause and Effect. *Journal of Vision*. 10. doi: 10.1167/10.14.22.
- **Donner TH**, Siegel M, Fries P & Engel AK. 2009. Build-up of Choice-Predictive Activity in Human Motor Cortex during Perceptual Decision-Making. *Current Biology*. 19: 1681-5. *Commentary*: Gross J & Ploner M, 2009. Perceptual Decisions: From Sensory Signals to Behavior. *Current Biology*. 19: R847-9.
- **Donner TH**, Sagi D, Bonnefante YS & Heeger DJ. 2008. Opposite Neural Signatures of Motion-Induced Blindness in Human Dorsal and Ventral Visual Cortex. *Journal of Neuroscience*. 28: 10298-310. *Commentary*: Blake R & Braun J, 2009. Visual Perception: The Elusive Footprints of Visual Awareness. *Current Biology*. 19, R30-2.
- Siegel M, **Donner TH**, Oostenveld R, Fries P & Engel AK. 2008. Neuronal Synchronization Along the Human Dorsal Visual Pathway Reflects the Focus of Spatial Attention. *Neuron* 60: 709-19.
- **Donner TH**, Siegel M, Oostenveld R, Fries P, Bauer M & Engel AK. 2007. Population Activity in the Human Dorsal Pathway Predicts the Accuracy of Visual Motion Detection. *Journal of Neurophysiology*. 98: 345-359.
- Siegel M, **Donner TH**, Oostenveld R, Fries P & Engel AK. 2007. High-Frequency Activity in Human Visual Cortex Is Modulated by Visual Motion Strength. *Cerebral Cortex*. 17: 732-741.
- Olma MC, **Donner TH** & Brandt SA. 2007. Control of Visual Selection during Vis-

ual Search in the Human Brain. *Journal of Eye Movement Research*. 1: 1-10; http://www.jemr.org/contents/volume_1/issue_1/olma.

- Parton A*, **Donner TH***, Donnelly N & Usher M. (* = Shared first authorship). 2006. Perceptual Grouping Based on Temporal Structure: Impact of Subliminal Flicker and Visual Transients. *Visual Cognition*. 13: 481-502.
- Schira M, Fahle M, **Donner TH**, Kraft A & Brandt SA. 2004. Differential Contribution of Early Visual Areas to the Perceptual Process of Contour Detection. *Journal of Neurophysiology*. 91: 1716-1721.
- **Donner TH**, Kettermann A, Diesch E, Villringer A & Brandt SA. 2003. Parietal Activation During Visual Search in the Absence of Multiple Distractors. *Neuroreport*. 14: 2257-2261.
- Müller NG, **Donner TH**, Bartelt OA, Brandt SA, Villringer A & Kleinschmidt A. 2003. The Functional Neuroanatomy of Visual Conjunction Search: A parametric fMRI Study. *Neuroimage*. 20: 1578-1590.
- Müller NG, Bartelt OA, **Donner TH**, Villringer A & Brandt SA. 2003. A Physiological Correlate of the 'Zoom Lens' of Visual Attention. *Journal of Neuroscience*. 23: 3561-3565.
- **Donner TH**, Kettermann A, Diesch E, Ostendorf F, Villringer A. & Brandt SA. 2002. Visual Feature and Conjunction Searches of Equal Difficulty Engage Only Partially Overlapping Frontoparietal Networks. *Neuroimage*. 15: 16-25.
- **Donner T**, Kettermann A, Diesch E, Ostendorf F, Villringer A & Brandt SA. 2000. Involvement of the Human Frontal Eye Field and Multiple Parietal Areas in Covert Visual Selection during Conjunction Search. *European Journal of Neuroscience*. 12: 3407-3414.

**Book
Chapters
etc.**

- Bonnef Y & **Donner T**. 2011. Motion Induced Blindness. *Scholarpedia*. 6(6): 3321 http://www.scholarpedia.org/article/Motion_induced_blindness.
- Siegel M & **Donner TH**. 2010. Linking Band-limited Cortical Population Activity to fMRI and Behavior. In M Ullsperger & S Debener (Eds.), *Integrating EEG and fMRI: Recording, Analysis, and Application*. Oxford University Press.

**Talks
(Selection)**

- Symposium *Unraveling Sequential Dependencies in Perceptual Choice*. European Conference on Visual Perception, Berlin. 28 August 2017. (Chair & speaker)
- Salzburg Mind-Brain Annual Meeting, University of Salzburg, 14 July, 2017.
- Neuroscience Workshop Saclay: *Neural circuits and behavior: From cells to connectivity and function*, Gif-sur-Yvette. 6 June, 2017.
- Laboratory for Neuro- and Psychophysiology, University of Leuven, 16 May, 2017.
- Center for Brain, Behavior, and Metabolism, Lübeck. 31 January 2017.
- BrainModes 2016 conference, Leuven. 1 December 2016.
- Sixth International *Symposium on Biology of Decision Making*, Paris. 25 May 2016.
- Zlotowski Center for Neuroscience. Ben Gurion University of the Negev. 26 April 2016.
- DGKN symposium *Die Bedeutung neuronaler Oszillationen für Hören und Schmerzwahrnehmung*, Düsseldorf. 17 March 2016.
- Workshop *Form and function of choice-related feedback signals in decision making*. CoSyne, Snowbird. 1 March 2016.
- Institute for Brain, Cognition and Behaviour, Universitat de Barcelona. 20 November 2015.
- European Institute of Theoretical Neuroscience (EITN) workshop *Probabilistic Inference and the Brain*, Paris. 10 September 2015.

- Dutch Neuroscience Meeting Symposium *Perceptual Decision-Making*. Lunteren. 12 June 2015.
- Computational Neuroscience Seminar, CRM, Barcelona. 15 May 2015.
- Institute of Neuroscience & School of Psychology, Trinity College Dublin. 13 April 2015.
- HBP-SP3 meeting, Paris. 7 April 2015.
- ICPS 2015 symposium *Model-based neuroscience of strategic decision-making*, Amsterdam. 13 March 2015.
- 2014 Tübingen MEG Symposium. 27 October 2014.
- Symposium *The Many Faces of Top-Down: an Integrative Perspective*. Organization for Human Brain Mapping, Hamburg. 10 June 2014. (Chair & speaker)
- Symposium *Dialogues on the Role of Top-down Factors in Sensory Processing*. Donders Institute, Radboud University Nijmegen. 21 May 2014.
- Department of Neurology, Lübeck University. 14 January 2014.
- Department of Integrative Neurophysiology, Center for Neurogenomics and Cognitive Research (CNCR), VU University Amsterdam. 8 October 2013.
- School of Psychology, Tel Aviv University. 17 December 2012.
- Department of Experimental Psychology, Oxford University. 5 December 2012.
- Institute of Cognitive Neuroscience, University College London. 3 December 2012.
- Symposium *Cortical Network Dynamics of Perceptual Decision-making*. BioMag Conference, Paris. August 28 2012.
- Lecture Series SFB *Multi-Site Communication in the Brain*. University Medical Center Hamburg-Eppendorf. 7 May 2012.
- Colloquium *New Insights from Model-based Cognitive Sciences*. Royal Netherlands Academy of Arts and Sciences. 2 May 2012.
- Workshop *Amsterdam Brain Connectivity*. University of Amsterdam. April 20 2012.
- Symposium *Changing Views: How Top-down Factors Alter Perception and Decision-making*. 13th NVP Winter Conference on Cognition, Brain, and Behaviour. December 16 2011.
- NWO-NRF Joint Seminar *The Brain as a Network and Brain Disorders as a Network Dysfunction*, Seoul National University. 27 January 2011.
- Princeton Neuroscience Institute, Princeton University. 21 May 2010.
- Donders Institute for Brain, Cognition and Behaviour. Nijmegen. 7 May 2010.
- Netherlands Institute for Neuroscience. Amsterdam. 29 April 2010.
- Dept. of Psychology, Leiden University. 24 March 2010.
- European Society for Cognitive and Affective Neuroscience Kick-off meeting, Amsterdam. 10 December 2009.
- School of Psychology, Tel-Aviv University. 23 March 2009.
- Dept. of Neurobiology, The Weizmann Institute of Science. Rehovot. 18 March 2009.
- Dept. of Psychology, University of Amsterdam. 23 October 2008.
- Bernstein Center for Computational Neuroscience, Berlin. 16 October 2008.
- Cognitive Neuroscience Sector, SISSA, Trieste. 29 July 2008.
- Symposium *A Multi-Level Perspective on the Neural Correlates of Perceptual Decision Making*. Organization for Human Brain Mapping, Chicago. 12 June 2007.
- Max-Planck Institute for Human Cognitive and Brain Science, Leipzig. 16 March 2006.

Teaching

Course Coordinator and Lecturer

(Evaluation based on scale: 0-10)

- *Brain Rhythms and Cognition* (Spring 2012/13/14; Evaluations: 9/9/9). Research Master Program Psychology (specialization Brain & Cognition), Dept. of Psychology, University of Amsterdam.
- *Perception and Visual Consciousness* (Spring 2010/11/12; Evaluations: 8/8/8). Bachelor Psychobiology, Dept. of Psychology and Sammerdam Institute for Life Sciences, University of Amsterdam
- *Neurosciences* (Spring 2010/11/12/13/14; Evaluations: 8/7.5/8/8/7.5). Bachelor Psychology, Department of Psychology, University of Amsterdam
- *Advanced Topics in Cognitive Neuroscience* (Fall 2009/10/11/12/13; Evaluations: 9/8/8/8/9). Research Master Brain & Cognition, Dept. of Psychology, University of Amsterdam
- *The Neurobiology of Decision-Making* (Spring 2011). Advanced course at the Interdisciplinary College (Innovationskolleg): *Autonomy, Decisions, and Free Will*. Guenne, Germany

Guest Lecturer

- *Spectral Analysis of Neural Mass Action* (Fall 2009/10/11/12). Research Master course *Neurophysiology*, Cognitive Science Center of the University of Amsterdam
- *Temporal Binding and Consciousness* (Spring 2001). Graduate course *Attention and Consciousness*, Inst. of Psychology, Humboldt-University of Berlin
- *The Binding Problem in Visual Perception* (Fall 1997). Undergraduate course *Perceptual Psychology*, Inst. of Psychology, Humboldt-University of Berlin