

Curriculum Vitae

Alexander Vinzenz Maier, Ph.D.

Assistant Professor
Department of Psychology
College of Arts and Science
Vanderbilt University
11 21st Avenue South
008 Wilson Hall
Nashville, TN 37240
Phone: 615-322-7466
Email: alex.maier@vanderbilt.edu
Web: <http://www.alexmaier.info>

Employment:

2011-present: **Assistant Professor**, Vanderbilt University, Nashville, TN, USA
2009-2011: **Research Fellow**, National Institutes of Health (NIH), Bethesda, MD, USA
2004-2008: **Visiting Fellow**, Unit of Cognitive Neurophysiology and Imaging,
National Institutes of Mental Health (NIMH), Bethesda, MD, USA

Education:

2005: **Ph.D.** ("*summa cum laude*") in Neural and Behavioral Sciences
Max-Planck-Institute for Biological Cybernetics, Tübingen, Germany /
Graduate School for Behavioral and Neurosciences, Tübingen, Germany
2002: **M.Sc.** in Neurobiology at the Ludwig-Maximilians-University, Munich, Germany
1999: **B.Sc.** in Biology at the Ludwig-Maximilians-University, Munich, Germany

Honors / Awards:

2009: Fellows Award of Research Excellence (National Institutes of Health)
2006: Klaus Tschira Award (German National Merit Foundation)
2006: Julius Axelrod Memorial Fellowship Award (National Institute of Mental Health)

Original publications:

Maier, A., Aura, C. & Leopold, D.A. (2011)
Infragranular origin of induced LFP responses in macaque primary visual cortex.
J. Neurosci. 31(6):1971-1980.

Maier, A., Adams, G.K., Aura, C. & Leopold., D.A. (2010)
Distinct Superficial and deep laminar domains of activity in the visual cortex during rest and stimulation.
Front. Syst. Neurosci. 4:31.

Schölvinck, M.L., **Maier, A.**, Ye, F.Q., Duyn, J.H. & Leopold, D.A. (2010)
Neural basis of global resting state fMRI activity.
Proc Natl Acad Sci U S A 107(22):10238-43.

Wang, Z., **Maier, A.**, Logothetis, N.K., Liang, H. (2009)
Extraction of bistable-percept-related features from local field potential by integration of local regression and common spatial patterns.
IEEE Trans. Biomed. Eng. 56(8):2095-2103

Wang, Z., **Maier, A.**, Logothetis, N.K., Liang, H. (2009)
Relaxation based feature selection for single-trial decoding of bistable perception.
IEEE Trans. Biomed. Eng. 56(1):101-110

Maier, A., Wilke, M., Aura, C., Zhu, C., Ye, F.Q. & Leopold, D.A. (2008)
Divergence of fMRI and neural signals in V1 during perceptual suppression in the awake monkey.
Nat. Neurosci. 11(10):1193-1200
[see also: DISPATCH: Blake, R. & Braun, J. (2009). *Curr. Biol.*, 19(10):R30-32]

Wang, Z., **Maier, A.**, Logothetis, N.K. & Liang, H. (2008)
Single-trial classification of bistable perception by integrating empirical mode decomposition, clustering
and support vector machine.
EURASIP Journal on Advances in Signal Processing 2008:592742

Wang, Z., **Maier, A.**, Logothetis, N.K. & Liang, H. (2008)
Single-trial decoding of bistable perception based on sparse nonnegative tensor decomposition.
Journal of Computational Intelligence and Neuroscience 2008:642387

Maier A., Logothetis, N.K. & Leopold, D.A. (2007)
Context-dependent perceptual modulation of single neurons in primate visual cortex.
Proc Natl Acad Sci U S A 104(13):5620-5625

Wang, Z., **Maier, A.**, Logothetis, N.K., Leopold, D.A., Liang, H., (2007)
Single-trial evoked potential estimation using wavelet.
Computers in Biology and Medicine. 37(4):463-473

Wang, Z., **Maier, A.**, Leopold, D.A., Liang, H. (2006)
Relaxation based multichannel signal combination (RELAX-MUSIC) for perceptual decisions using the
area under the ROC Curve.
IEEE Transaction on Biomedical Engineering 5(12):2615-2618

Maier, A., Logothetis, N.K. & Leopold, D.A. (2005)
Global competition dictates local suppression in pattern rivalry.
JOV 5(9):668-677

Maier, A., Wilke, M., Logothetis, N.K. & Leopold, D.A. (2003)
Perception of temporally interleaved ambiguous patterns.
Curr. Biol. 13:1076-1085
[see also: HIGHLIGHT: Jones, R. (2003). *Nat. Rev. Neurosci.* 4, 612]

Leopold, D.A., Wilke, M., **Maier, A.** & Logothetis, N.K. (2002)
Stable perception of visually ambiguous patterns.
Nat. Neurosci. 5(6): 605-609

Review Articles:

Leopold, D.A. & **Maier, A.** (2011)
Ongoing physiological processes in the cerebral cortex.
Neuroimage (in press)

Leopold, D.A. & **Maier, A.** (2006)
Neuroimaging: Perception at the brain's core.
Curr. Biol. 16(3):R95-8

Maier, A. (2006)
Schlechte Nachrichten für Gedankenleser.
Bild der Wissenschaft 11/2006

Leopold, D.A., **Maier, A.** & Logothetis, N.K. (2003)
Measuring subjective visual perception in the nonhuman primate.
J. Consc. Stud. 10(9-10): 115-130

Nikol, S., **Maier, A.**, Krausz, E., Hoefling, B., Huehns, T.Y. (1998)
Current biotechnological approaches to the prevention of restenosis.
BioDrugs 9(5): 376-388

Book Chapters:

Maier, A. & Shmuel, A. (in preparation)
Microcircuits, Electrophysiology and fMRI signals
In: Uludag, K. & Ugurbil, K. (eds.)
Springer.

Maier, A. & Leopold, D.A. (2009)
Binocular Rivalry.
In: Wilken, P., Bayne, T., Cleeremans, A. (eds.)
Oxford Companion to Consciousness. Oxford, UK,
Oxford University Press. ISBN: 978-0-19-856951-0

Maier, A. & Leopold, D.A. (2009)
Binocular Rivalry
In: Binder, M.D., Hirokawa, N., Windhorst, U., Hirsch, M.C. (eds.)
Encyclopedia of Neuroscience.
Springer. ISBN: 978-3-540-29678-2

Leopold, D.A., **Maier, A.**, Wilke, M. & Logothetis, N.K. (2004)
Binocular rivalry and the illusion of monocular vision.
In: D. Alais & R. Blake (eds.), Binocular rivalry and perceptual ambiguity, Cambridge, MA:
MIT Press. ISBN: 978-0-262-01212-6

Professional Affiliations:

2002-present: Society for Neuroscience
2004- present: Vision Science Society
2005- present: Association for the Scientific Study of Consciousness
2005- present: German Scholars Organization
2008- present: German Academic International Network

Invited Talks and Seminars:

11/23/2011 **Royal Academy of Arts and Sciences**, Amsterdam, The Netherlands
06/20/2011 **Johns Hopkins University**, Baltimore, MD, USA
04/05/2011 **Harvard University**, Boston, MA, USA
03/03/2011 **University of Washington**, Seattle, WA, USA
01/31/2011 **Vanderbilt University**, Nashville, TN, USA
12/08/2010 **Oxford University**, Oxford, UK
07/16/2010 **Harvard University**, Boston, MA, USA
01/08/2010 **Medical Research Council, Cognition and Brain Sciences Unit**, Cambridge, UK
08/13/2009 **Tamagawa University**, Tokyo, Japan
08/03/2009 **Okinawa Institute of Science and Technology**, Okinawa, Japan
07/01/2009 **Donders Institute for Brain, Cognition and Behaviour**, Nijmegen, The Netherlands
02/27/2009 **Newcastle University**, Newcastle upon Tyne, UK
04/09/2007 **Princeton University**, USA
02/23/2007 **Yale University**, CT, USA
04/11/2006 **University of Texas**, Houston, TX, USA

Invited Conference and Symposium Talks:

- 06/24/2010 **14th Annual Meeting of the ASSC, (*Symposium chair*)**, Toronto, Canada
05/07/2010 **10th Annual Meeting of the Vision Sciences Society, (*Symposium talk*)**, Naples, FL
08/08/2009 **32nd European Conference on Visual Perception, (*Symposium talk*)**, Germany
09/11/2008 **31st Meeting of the Japan Neuroscience Society, (*Symposium talk*)**, Tokyo, Japan

Invited Didactical Talks at Advanced Schools, Workshops and Conferences:

- 04/04/2011 **Guest Lecture** at the Mind/Brain/Behavior Interfaculty Initiative (MBB), Harvard University, Boston, MA
02/28/2011 **Workshop** at the 11th Annual Meeting for Computational and Systems Neuroscience, Salt Lake City, UT
06/23/2010 **Tutorial** at the 14th Annual meeting of the Association for the Scientific Study of Consciousness, Toronto, Canada
06/24/2005 **Tutorial** at the 9th Annual meeting of the Association for the Scientific Study of Consciousness, Pasadena, CA

Academic Teaching:

- Fall 2011: NURO 340: Systems Neuroscience: *Higher-order visual processes*.
Spring 2012: PSY 344: Neuroscience Graduate Seminar: *Neuroscience of Consciousness*.

Students/Alumni:

- 2010-11: Michele Cox (now in graduate studies at **Vanderbilt University**, Nashville, TN)
2008-09: Eric Reavis (now in graduate studies at **Dartmouth College**, Hanover, NH)
2007-08: Geoffrey Adams (now in graduate studies at **Duke University**, Durham, NC)
2005-07: Christopher Aura (now in graduate studies at the **University of Alabama**, Birmingham, AL)

Service:

- 2011-present: Neuroscience representative to colloquium committee, Vanderbilt University
2010-2011: Workshop Organizer, Cosyne 11, Salt Lake City, UT (co-organizer: N. Tsuchiya)
2009-2011: Committee Member, Association for the Scientific Study of Consciousness
2009-2010: Symposium Organizer, ASSC 14, Toronto, CA (co-organizer: N. Tsuchiya)
2009-2010: Symposium Organizer, VSS 11, Naples, FL (co-organizers: J. van Boxtel, N. Tsuchiya)

Reviewer for:

Science, Nature Neuroscience, Neuron, PNAS, Journal of Neuroscience, Current Biology, Trends in Cognitive Sciences, Neuroimage, Human Brain Mapping, Journal of Cognitive Neuroscience, Journal of Vision, Journal of Neurophysiology, Biological Cybernetics, Psychophysiology

Editor for:

Frontiers in Human Neuroscience
Frontiers in Perception Science
Frontiers in Consciousness Research

Conference Contributions (in chronological order):

Maier, A., Cox, M.A., Reavis, E.A., Adams, G.K. & Leopold, D.A. (2011) Perceptual awareness and selective attention differentially modulate neuronal responses in primary visual cortex. *SfN*

Cox, M.A., Schmid, M.C., Peters, A., Saunders, R., Leopold, D.A. & Maier, A., (2011) Single neuron and LFP responses to subjective shapes in area V4. *SfN*

Spaak, E., Bonnefond, M., Maier, A., Leopold, D.A. & Jensen, O. (2011) Cross-Laminar Alpha/Gamma Interactions in Monkey V1. *Champalimaud neuroscience symposium*

Cox, M.A., Maier, A., Schmid, M.C., Peters, A., Smith, K., Saunders, R., Mitz, A. & Leopold, D.A. (2011) Neural Correlates of Illusory Shape Perception in Primate Visual Cortex. *APS*

Maier, A. (2011) From neurons to networks - the search for the neural correlate of consciousness in primate visual cortex. [Symposium talk: *Computational and Theoretical Approaches to the Problem of Consciousness*] Cosyne

Maier, A. (2010) Activity in the primary visual cortex related to visual awareness. [Symposium talk: Neurophysiological approaches within the scientific study of consciousness] ASSC

Maier, A. (2010) Selective attention and perceptual suppression independently modulate contrast change detection [Symposium talk: Dissociations between top-down attention and awareness] VSS

Maier, A., Reavis, E., Adams, G., Leopold, D.A. (2009) Selective attention and perceptual suppression independently modulate contrast change detection. SFN

Reavis, E., Leopold, D.A., Maier, A. (2009) Saccadic modulation of laminar field potentials in primate visual cortex. SFN

Maier, A., (2009) Visual awareness correlates with layer-specific activity in primary visual cortex. [Symposium talk: Neural basis of consciousness] ECVF

Maier, A.V., Adams, G.K., Aura, C., Leopold, D.A. (2009) Distinct laminar zones of coherent local field potentials in monkey V1. Cosyne

Maier, A., Aura, C., Leopold, D.A. (2009) Visual awareness correlates with layer-specific activity in primary visual cortex. VSS

Scholvinck, M., Ye, F.Q., Zhu, C., Maier, A., Duyn, J., Leopold, D.A. (2009) State-dependent, widespread correlation of neural and fMRI endogenous fluctuations in the awake monkey. ISMRM

Maier, A.V., Adams, G.K., Aura, C., Leopold, D.A. (2008) Distinct laminar zones of coherent local field potentials in monkey V1. SFN

Adams, G.K., Maier, A.V., Aura, C., Leopold, D.A. (2008) Endogenous fluctuations of LFP power in monkey V1 are compartmentalized into superficial and deep laminar zones. SFN

Schölvinck, M.L., Maier, A.V., Ye, F., Zhu, C., Leopold, D.A. (2008) The neural basis of fMRI functional connectivity. SFN

Tsuchiya, N., Maier, A.V., Logothetis, N.K., Leopold, D.A. (2008) Decoding kinetic depth using only the temporal structure of spike trains from area MT. SFN

Leopold, D.A., Aura, C., Maier, A.V. (2008) Laminar analysis of local field and current source density during physical and perceptual events in monkey V1. SFN

Maier, A., Wilke, M., Aura, C., Zhu, C., Ye, F., Leopold, D.A. (2008) What happens in primary visual cortex when a stimulus becomes visible? Insights from fMRI and layer-specific neurophysiology in non-human primates. 31st Annual Meeting of the Japan Neuroscience Society

Tsuchiya, N., Maier, A., Logothetis, N.K., Leopold, D.A. (2008) Decoding monkey's conscious experience during ambiguous and unambiguous motion percept reveals initial non-conscious spike activity and later neuronal correlates of consciousness in area MT. ASSC 12.

Maier, A., Aura, C., Leopold, D.A. (2008) Visual awareness correlates with layer-specific activity in visual cortex. ASSC 12

Tsuchiya, N., Maier, A., Logothetis, N.K., Leopold, D.A. (2008) Decoding monkey's conscious experience during ambiguous and unambiguous motion percept reveals initial non-conscious spike activity and later neuronal correlates of consciousness in area MT. Toward a Science of Consciousness. 8th biennial Tucson conference.

Maier, A., Wilke, M., Aura, C., Zhu, C., Ye, F. & Leopold, D.A. (2007) Stimulus invisibility uncouples the fMRI BOLD response from neuronal spiking activity in V1. ASSC 11

Liang, H., Wang, Z., Leopold, D.A., Maier, A. (2007) Optimal spatio-temporal pooling of neural responses in area MT. CNS

Wang, Z., Maier, A., Leopold, D.A., Liang, H. (2007) Spatiotemporal Integration of Neuronal Activity for Single-Trial Classifications of Bistable Perception. IJCNN

Zhu, C., Maier, A., Ye, F.Q., Leopold, D.A. (2007) High resolution RF coil insert for electrophysiological recording chambers. ISMRM

Maier, A., Wilke, M., Aura, C., Zhu, C., Ye, F.Q., Leopold, D.A. (2006) Stimulus invisibility uncouples BOLD from neuronal responses in monkey primary visual cortex. Soc. Neurosci. Abstr. Online.

Aura, C., Maier, A., Leopold, D.A. (2006) Investigation of state-dependent differences of neuronal activity across cortical layers in monkey visual cortex. Soc. Neurosci. Abstr. Online.

Wang, Z., Maier, A., Logothetis, N.K., Leopold, D.A., Liang, H. (2006) Neural population activity in area MT improves determination of perceptual states. Soc. Neurosci. Abstr. Online

Liang, H., Wang, X., Z. Wang, Logothetis, N.K., Leopold, D.A., Maier, A. (2006) A comparison of local field potentials and spiking activity to predict perceptual report during bistable visual stimulation. Soc. Neurosci. Abstr.

Wang, Z., Maier, A., Logothetis, N.K., Leopold, D.A., Liang, H. (2006) Neural population activity in area MT improves determination of perceptual states. 2nd Annual Conference on Computational Cognitive Neuroscience

Liang, H., Wang, X., Z. Wang, Logothetis, N.K., Leopold, D.A., Maier, A. (2006) A comparison of local field potentials and spiking activity to predict perceptual report during bistable visual stimulation. 2nd Annual Conference on Computational Cognitive Neuroscience

Leopold D. A., Wilke M., Maier A. (2006) What processes in the brain make a stimulus visible? Neural correlates of consciousness: new trends and data. Abstract A027.3, FENS Forum Abstracts, vol. 3, 2006.

Maier, A., Logothetis, N.K. & Leopold, D.A. (2005) Percept-related fluctuations of MT local field potentials. Soc. Neurosci. Abstr. Online.

Moutoussis, K., Maier, A., Zeki, S., Logothetis, N. (2005) Seeing invisible motion: Responses of area V5 neurons on the awake-behaving macaque. Soc. Neurosci. Abstr. Online.

Maier, A., Wilke, M.,(2005) Investigating Neuronal Correlates of Conscious Visual Perception. [Tutorial]. ASSC 9.

Maier, A., Wilke, M., N.K. Logothetis, D.A. Leopold. (2005) Perceptual and neuronal dynamics of binocular rivalry flash suppression. *Journal of Vision* 5(8), Abstract 12, Page 12a.

Maier, A., N.K. Logothetis, D.A. Leopold. (2003) A comparison of perception-related activity in the visual cortex using different ambiguous patterns. Program No. 550.2 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, 2003. Online.

Maier, A., Logothetis, N.K., Leopold, D.A. (2003) Competition and integration in monocular rivalry. *Perception* 32:115 (Suppl.)

Maier, A., Leopold, D.A. and Logothetis, N.K. (2002) Neural activity during stable perception of ambiguous displays in monkey visual cortex. Program No. 161.13 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, 2002. Online.

Wilke, M., Maier, A., Leopold, D.A., Ghazanfar, A., Logothetis, N.K., Periods of stimulus absence stabilize the perception of ambiguous patterns, Soc. Neurosci. Abstr., Vol. 27, Program No. 165.16, 2001

Maier, A., Wilke, M., Leopold, D.A., Treue, S., Logothetis, N.K., Parallel perception of multiple visually bistable patterns, Soc. Neurosci. Abstr., Vol. 27, Program No. 165.15, 2001