

## Curriculum Vitae

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### Prof. Dr. Thomas Nowotny

*Professor of Informatics, Centre for Computational Neuroscience and Robotics (CCNR), School of Engineering and Informatics, University of Sussex, Brighton BN1 9QJ, United Kingdom*

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<http://www.sussex.ac.uk/Users/tn41/>

### Personal Details

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<i>Name</i>	Thomas Nowotny
<i>Birth</i>	17 September 1971, Kassel, Germany
<i>Current Post</i>	Professor of Informatics

### Education

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Nov 2010	<b>Postgraduate Certificate of Teaching in Higher Education (PGCertHE)</b> , University of Sussex
Nov 2001	<b>Dr. rer. nat. in Physics</b> , Universität Leipzig Dissertation: <i>Phase transitions and multifractal properties of random field Ising models</i> , Adviser: U. Behn Final exams in: Statistical Physics, Stochastic Processes
Jul 1998	<b>Diplom in Physics</b> , Georg-August Universität Göttingen Thesis: <i>Untersuchung geometrischer Strukturen in zellularen Netzwerken und Graphen im Hinblick auf eine Beschreibung der Feinstruktur der physikalischen Raumzeit auf der Planckskala</i> , Adviser: M. Requardt Final exams in: Theoretical Physics, Experimental Physics, Astrophysics, Probability Theory
1995 – 1996	<b>Participation in the Education Abroad Program</b> , University of California Riverside
Jul 1994	<b>Vordiplom in Physics</b> , Georg-August Universität Göttingen Final exams in: Theoretical Physics, Experimental Physics, Chemistry, Mathematics

### Career History

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2/2014 – present	<b>Director of Research and Knowledge Exchange</b> , School of Engineering and Informatics, University of Sussex
7/2013 – present	<b>Professor of Informatics</b> , University of Sussex
8/2012 – 7/2013	<b>Reader</b> , University of Sussex
2/2012 – 8/2012	<b>Senior Lecturer</b> , University of Sussex

2011 – 2013	<b>Distinguished Visiting Scientist</b> (August-October 2011, December 2012 - February 2013), CSIRO Ecosystems Sciences, Canberra, Australia
2010 – 2012	<b>Senior Research Fellow</b> , University of Sussex
2007 – 2010	<b>RCUK Academic Fellow</b> , University of Sussex
2004 – 2007	<b>Assistant Research Scientist</b> , Institute for Nonlinear Science, University of California, San Diego (UCSD)
2002 – 2004	<b>Postgraduate Researcher</b> , Institute for Nonlinear Science, UCSD
1999 – 2001	<b>PhD student</b> in the graduate program (DFG Graduiertenkolleg) <i>Quantenfeldtheorie: Mathematische Struktur und ihre Anwendungen in der Elementarteilchen und Festkörperphysik</i> , Institute for Theoretical Physics, Universität Leipzig
1997 – 1998	<b>Assistant</b> , Data Processing Group, Max-Planck Institute for Fluid Dynamics, Göttingen

## Prizes, Awards and Honours

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2014 – 2015	<b>Senior Research Fellowship</b> , Royal Academy of Engineering/ The Leverhulme Trust
2010 – 2013	<b>Distinguished Visiting Scientist</b> , CSIRO, Canberra, Australia
2007 – 2012	<b>RCUK Academic Fellowship</b> , University of Sussex
1998 – 2001	<b>PhD fellowship</b> of the German Science Foundation (Deutsche Forschungsgemeinschaft) <b>Nomination for a fellowship</b> with the Studienstiftung des deutschen Volkes
1993	<b>“Best student” award</b> in Theoretical Mechanics
1992	<b>Finalist of the German National Competition in Computer Science</b> (“Bundeswettbewerb Informatik”), Bundesministerium für Bildung und Forschung & Gesellschaft für Mathematik und Datenverarbeitung
1991	<b>Best graduate 1991</b> , Engelsburg Gymnasium, Kassel (high school) <b>Nomination for a fellowship</b> with the Cusanus foundation

## Grants

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01-2019 – 04-2019	Sussex Research Development Fund, <i>Closed-loop Computational Electrophysiology</i> £10,540, <b>Role: PI</b>
04-2018 – 03-2020	Human Brain Project Specific Grant Agreement 2 - HBP SGA 2, £159,953, <b>Role: PI</b>
10-2017 – 09-2020	BBSRC project, <i>Updating of memories during memory consolidation</i> , £695,885, <b>Role: co-I</b>
03-2017 – 03-2019	Royal Society networking grant, <i>Bionic communications and networking for connected vehicles</i> , £10,500, <b>Role: co-I</b>

- 12-2016 – 12-2021 EPSRC Programme Grant, *Brains on Board: Neuromorphic Control of Flying Robots*, £4,816,675 total, £1,590,420 at Sussex, **Role: PI at Sussex**
- 10-2016 – 09-2017 NVIDIA studentship, *Artificial Intelligence Methods for Big Image Data Analysis using GPU's* for Gang Wu, £15,873, **Role: PI**
- 04-2016 – 03-2018 Human Brain Project Specific Grant Agreement 1 - HBP SGA1, £772, **Role: PI**
- 07-2015 – 06-2018 Human Frontiers Science Program (HFSP) project grant, *Odor-background segregation and source localization using fast olfactory processing*, £210,104, **Role: PI**
- 04-2014 – 09-2015 Human Brain Project (EU FP7), *Neuromorphic Implementations of Multivariate Classification Inspired by the Olfactory System [NEUROCLAS-SIOS]*, £85,816, **Role: PI**
- 04-2014 – 09-2014 E futuresXD (EPSRC), *Fast electronic noses through spiking neuromorphic networks*, £46,346, **Role: PI**
- 09-2014 – 08-2016 Marie Curie Fellow Dr. Michael Schmukey, *Biomachinelearning: Bio-inspired Machine Learning for Chemical Sensing*, £170,910, **Role: Scientist in Charge**
- 09-2014 – 08-2015 Royal Academy of Engineering/ The Leverhulme Trust Senior Research Fellowship, *Enabling scientific computing with GPUs with domain specific languages and meta-compilers*, £44,522, **Role: PI**
- 2013 – 2014 CSIRO Flagship Collaboration Fund Project, *Systematic Benchmarking of Chemical Sensory Arrays Using Feature Selection and Machine Learning*, £35,539, **Role: PI**
- 2013 – 2016 BBSRC grant, *Lapses in memory: opportunities for adaptive behaviour* (PI Ildiko Kemenes), £742,674, **Role: Co-I**
- 2012 – 2015 EPSRC grant, *Green Brain - Computational Modelling of the Honeybee Brain*, collaboration with Sheffield University (PI Marshall), £988,073, Sussex awarded £335,477, **Role: PI**
- 2011 – 2013 Distinguished Visiting Scientist Award, CSIRO Ecosystems Sciences, Canberra, Australia, AU\$15,000, **Role: PI**
- 2010 NVidia Professor partnership, Hardware donation by NVidia Corporation, estimated value £3,000, **Role: Co-PI** (shared with Dr. L. Berthouze)
- 2010 – 2013 BBSRC grant, *Decision Making and Learning in Neuronal Networks* (PI O'Shea), £1,120,045, **Role: Co-I**
- 2009 Travel grant of the UK foreign office to Prof. Brian H. Smith, Arizona State University, £1,700, **Role: Co-PI & host**
- 2009 – 2010 EPSRC Cross-Disciplinary Feasibility Account (PI Husbands), £200,000, **Role: Co-I**
- 2009 Wellcome Trust *VIP support* for David Samu, £4,000, **Role: Co-PI**

- 2008 – 2011 BBSRC grant in the ANR-BBSRC SysBio Initiative, *Olfactory Coding in the Insect Pheromone Pathway: Models and Experiments* (PheroSys) with two French partners (PIs Rospars and Martinez), £768,112, Sussex awarded £467,000, **Role: PI and British team coordinator**
- 2006 German Ministry of Science and Education (BMBF), *Bernstein Collaboration* grant between the University of Konstanz and the Bernstein Center Berlin (PIs Menzel and Galizia), **Role: initially named co-applicant, later consulting associate**
- 2005 NSF/NIH grant RO1 NS050945, *Dynamical Principles of Neuronal Motor Microcircuits* (PI Selverston), \$1,974,000, **Role: named researcher/investigator**, participation 1.5 years at 100%, UCSD, USA
- 2003 NSF grant PHY 0414174, *Enhanced Synchronization of Neurons with Synaptic Plasticity: Its Origins and Its Role in Learning & Information Transport* (PI Abarbanel), \$300,000, **Role: named researcher/investigator**, participation 1 year at 100%, UCSD, USA

## Academic Supervision

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### Postdoctoral Fellows

- 2017 – present Dr. James Knight, Brains on Board project (EPSRC)
- 2017 – present Dr. James Bennett, Brains on Board project (EPSRC)
- 2017 – present Dr. Alexander Dewar, Brains on Board project (EPSRC)
- 2017 – present Dr. Mario Pannunzi, Odor Objects project (HFSP)
- 2014 – 2016 Dr. Michael Schmuker, MSCA fellow (EU H2020)
- 2014 – 2017 Dr. Alan Diamond, eFuturesXD (EPSRC), HBP (EU 2020), Odor Objects project (HFSP)
- 2013 – 2016 Dr. Esin Yavuz, Green Brain project (EPSRC)
- 2010 – 2013 Dr. Zolt Pirger (20%), *Decision making and Learning in Neural Networks*, shared with M. O'Shea and G. Kemenes (BBSRC)
- 2008 – 2011 Dr. Christopher L. Buckley, PheroSys project (BBSRC), now lecturer at the University of Sussex
- 2008 – 2010 Dr. Andrei Zavada, PheroSys project (BBSRC), now software architect, Kiev, Ukraine
- 2008 – 2010 Dr. Antoine Chaffiol (20%), PheroSys project at INRA Versailles (ANR), shared with D. Martinez and J.-P. Rospars
- 2007 Dr. Michael Schmuker, visiting research fellow

### PhD Students

- 2018 – present Norbert Domscek (60%), with Andrew Philippides (40%), EPSRC scholarship

- 2018 – present Efstathios Kagoulis (40%), with Adnrew Philippides (60%), Engineering and Informatics School scholarship
- 2018 – present Stefan Meyer (10%), with Andrew Philippides (60%) and Paul Graham (30%), Engineering and Informatics School scholarship
- 2017 – present Fabian Steinbeck (40%), with Paul Graham (60%), Life Sciences and Engineering and Informatics School scholarship
- 2016 – present Manuel Baltieri (30%) with Chris Buckley (70%), Engineering and Informatics School scholarship
- 2015 – present Felix B. Kern (40%), with George Kemenes (60%) Life Sciences School scholarship
- 2015 – 2018 Ho Ka Chan (100%) Odor Objects projects (HFSP)
- 2014 – present Daniel Price (30%), with Ildiko Kemenes (70%) Life Sciences School scholarship
- 2014 – present James Turner (70%), with Luc Berthouze (30%), Engineering and Informatics School scholarship
- 2013 – 2017 Gang “Rick” Wu (50%), with David Li (50%), *Design and Implementation of an Innovative High-speed Fluorescence Lifetime Imaging Microscopy Analysis System*, Chinese Council scholarship
- 2011 – 2014 Thomas “Greg” Corcoran (60%) with Andy Philippides, Engineering and Informatics School scholarship; withdrawn for personal reasons 2014
- 2010 – 2011 Damien Drix (100%), funded by EPSRC feasibility account, left for personal reasons.
- 2010 – 2014 Dawood Parpia (85%) with G. Kemenes (15%), *Neural Plasticity and the Limits of Scientific Knowledge*, self-funded
- 2009 – 2012 David Samu (60%) with A. Seth (25%) and G. Kemenes (15%), *Module hierarchy and centralisation in the anatomy and dynamics of human cortex*, Engineering and Informatics School scholarship
- 2009 – 2013 Michael Crossley (25 %) with G Kemenes (50 %) and K. Staras (25 %), *Neural mechanisms of decision making in the pond snail *Lymnaea stagnalis**, BBSRC scholarship
- 2008 – 2012 Lucas Wilkins (30%) with D. Osorio (70%), *The Geometry of Animal Colour Vision*, BBSRC scholarship, self-funded

### MSc Students

- 2017 Timothy Jose Sanmoogan, *Bicycle recognition with machine learning*
- 2015 Arnav Ray, *Equivalence of biological and machine learning*
- 2014 Haiming O Ou, *Feature selection and classification of a chemical sensor arrays*
- 2013 Divya Sivaram, *Using GPUs to super-charge brain simulations*

- MD Korban ul Akter, *Dealing with sensory drift: Using SVM based Ensemble*
- 2012 Nicholas Hockings, *The Role of Materials in Passive Dynamics, Sensation and Motor Control of the Human Hand*
- Dylan Lentini, *On the Equivalence of Biological and Machine Learning*
- 2011 – 2012 Plutarco Naranjo, *A machine learning approach to geometric technical analysis using star price patterns*
- 2010 Damien Drix, *Compact storage of sequences in scalable spiking neural networks*
- 2011 Swarup Karavadi *Multi-Species Genetic Algorithm based Elastic Load Balancer for Optimal Scale on the Cloud*
- 2010-2011 David Vardanjan, *Using STDP clustering in a biomimetic neural network for hand-written digit classification on a NVIDIA<sup>®</sup> GPU*
- 2009 David Samu, *A high fidelity brain-machine interface in a hybrid system: Implementation, test and comparison of a real-time electrode-response compensation technique on a Dynamic Clamp system*
- 2008 Neil Mather, *3D Visualisation Software for Neural Networks*

### Undergraduate Students

- 2018 Alessia Nigretti, *Biofeedback-Driven Virtual Reality Tool*
- Craig Gibbs, *Biological vs Machine Learning: A comparison of artificially reconstructed Hebbian learning systems and SVM machine learning methods*
- Yifan Zhou, *Rendering engine combining Raytracing and Rasterizing*
- 2017 Yunis Murad, *Gain control in neural networks*
- Vasyl Kodre, *Visualising neuronal networks with Blender and Python*
- Sze Yin Lai, *Visualising neurons with Blender using its Python interface*
- 2016 Daniel Saska, *Fast methods for building accurate models of individual neurons* (Brandwatch prize for best artificial intelligence project 2016)
- 2015 Daniel Hellowell, *Applet for analysis and exploration of neurons*
- 2014 James Turner, *Spiking Neural Network Parallelisation and Optimisation on Heterogeneous Computer Architectures*
- 2012 Philip KE Woods, *Stock market strategies for small investors based on AI*
- 2011 Steven Muggeridge, *Neural Network Simulation Tool using NVIDIA CUDA*
- Mauro Melo *Classifying news with biomimetic algorithms*
- Tiago de Sa Martins, *High Frequency Stock Market Trading Strategies for Small Investors*
- 2010 Farrel Hayman, *Jiggy - Java Audio Application*
- Robert Lowdon, *Web-based fantasy F1 game*

- 2009 Ioannis Limistiras, *Dynamic multimedia website developed in flash and php*  
 2008 Patrick Quish, *Artificial Intelligence for PacMan*

### Co-supervised PhD Students at UCSD

- 2006 – 2007 Leif Gibb, *Inhibition, Recurrent Excitation, and Neural Feedback in Computational Models of Sparse Bursting and Birdsong Sequencing*, UCSD (graduated 2009)  
 2006 – 2007 Corinne Teeter, *Characterizing the Spatial Density Functions of Neural Arbors*, UCSD (graduated 2010)  
 2002 – 2004 Valentin Zhigulin, *Multiple-scale dynamics in neural systems: learning, synchronization and network oscillations*, California Institute of Technology  
 2003 – 2006 Sachin Talathi, *Biophysical modelling of synaptic plasticity and its function in the dynamics of neuronal networks*, UCSD

### Examination

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- 2013 – 2017 External examiner for the “MSc in Cognitive and Computational Neuroscience”, School of Psychology, University of Sheffield

#### External PhD Examination

- 2017 External PhD examiner, Tiago Gehring, University of Sheffield  
 2016 External PhD examiner, Luis Fernandez, Universidad de Barcelona  
 External PhD examiner, Yann Sweeney, KTH  
 External PhD examiner, Andrew Mundy, University of Manchester  
 External PhD examiner, Fei Peng, Queen Mary, University of London  
 2015 External PhD examiner, Yann Sweeney, University of Edinburgh  
 2013 External PhD examiner, Karan Safaryan, University of Hertfordshire  
 2012 External PhD examiner, Ioana Sporea, University of Surrey  
 2010 External PhD examiner, Fabiano Baroni, Universidad Autónoma de Madrid  
 Opponent, Malin Sandström, Royal Institute of Technology (KTH), Stockholm  
 2009 External PhD referee, Jorge Mejias, European Doctorate, University of Granada  
 2008 External PhD Examiner, Michael Forrest, University of Warwick

#### Internal PhD Examination

- 2017 Phil Tee, University of Sussex  
 2015 Alexander Dewar, University of Sussex  
 James Thorniley, University of Sussex

2011	Paul Chorley, University of Sussex
2010	Nathaniel Virgo, University of Sussex
2009	Paul Horton, University of Sussex Peter Passaro, University of Sussex
2008	Daniel Bush, University of Sussex

### PhD Committees

2010 – 2013	External PhD committee, Angela Rouyar, INRA Versailles
2008 – 2011	External PhD committee, Hana Belmabrouk, INRIA Nancy
2008 – 2011	External PhD committee, Alexandre Grémiaux, INRA Versailles
2008 – present	Internal PhD committees: Saqib Khan, Lorenzo Grespan, Paul Chorley, Thomas “Greg” Corcoran, Nick Ward. Jack Pay, Philipp Streicher, William Thierry Alain Frier, Dmitrijs Dmitrenko, Peter Overbury, Malamati Bitzidou, Pietro Galliani

### Scholarship

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2018 – present	<b>Associate Editor</b> Frontiers in Neuroscience (section Neuromorphic Engineering)
2017 – present	<b>Program Chair</b> of the Organisation for Computational Neuroscience (OCNS)
2014 – present	<b>Associate Editor</b> Frontiers in Robotics and AI (section Computational Intelligence)
2014 – 2016	<b>Director</b> of the Organisation for Computational Neuroscience (OCNS)
2013 – present	<b>Member of the Steering committee of Sussex Neuroscience</b>
2012 – 2016	<b>Member of the Steering committee</b> of the UK INCF node.
2012 – present	<b>Member of the editorial board</b> of the Encyclopedia of Nanotechnology
2011 – present	<b>Associate editor</b> , Frontiers in Neuroengineering (Research Topic: “Bioinspired solutions to the challenges of chemical sensing”)
2010 – 2013	<b>Member of the CNS program committee</b>
2009	<b>Associate editor</b> for PLoS Computational Biology
2008 – present	<b>Member of the editorial board</b> of the Journal of Ion Channels
2008 – present	<b>Reviewer</b> for BBSRC, EPSRC, The Leverhulme Trust, Wellcome Trust, ANR, SNSF



- 2002 – present      **Referee for scientific journals:**  
 Journal of Neuroscience, Biological Cybernetics, Physical Review Letters, Physical Review E, Physics Letters A, Journal of Neurophysiology, Chemical Senses, IEEE Transactions in Circuits & Systems, Europhysics Letters, Advances in Complex Systems, European Journal of Applied Physiology, Journal of Theoretical Biology, PLoS Computational Biology, PLoS ONE, Computational Intelligence and Neuroscience, Journal of Computational Neuroscience, Journal of Automation, Mobile Robotics & Intelligent Systems, Chaos, Network: Computation in Neural Systems, Frontiers in Neuroscience, Frontiers in Neuromorphic Engineering, Sensors and Actuators, Scientific Reports

## Conference and Workshop Organisation

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- 2018      **Co-organisation** of the workshop “Workshop on Insect and Robot Neuroethology”, University of Sussex, 14 June 2018, 40 participants
- 2016      **Oversight over all workshops** of the CNS\*2016 annual meeting in Jeju Island, South Korea, ca. 350 participants
- 2013      **Organisation of the scientific programme** of the CNS\*2013 annual meeting in Paris, France, ca. 700 participants
- 2012      **Organisation of the scientific programme** of the CNS\*2012 annual meeting in Atlanta/Decatur, USA, ca. 350 participants
- 2012      **Organisation** of the international workshop “Examining the dynamic nature of neural representations with the olfactory system” at CNS\*2012, ca. 20 participants
- 2012      **Organisation** of the 2nd CCNR workshop, University of Sussex, ca. 50 participants
- 2011      **Organisation of the scientific programme** of the CNS\*2011 annual meeting in Stockholm, Sweden, ca. 600 participants
- 2010      **Organisation** of the “International Workshop on Dynamical Olfaction”, Brighton, ca. 50 participants
- 2007      **Organisation** of the 1st CCNR workshop, University of Sussex, ca. 50 participants

## Teaching

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### General Curriculum at the University of Sussex

- 2012 – 2013, 2016 – present      **Convener**, Mathematical Concepts, 1st year undergraduate module, 120-170 students, 3 contact hours/week
- 2012 – 2014      **Convener**, Mathematics and Computational Methods for Complex Systems, MSc module, 10-40 students, 4 contact hours/week
- 2012      **Convener**, Technical Communication Skills, 1st year undergraduate course, 140 students, 2 contact hours/week

- 2011 – 2012      **Convener**, Computational Neuroscience, MSc level, with Luc Berthouze (load 50%), 5-15 students, 2 contact hours/week
- 2011 – present    **Lecturer**, Neural Circuits, undergraduate course in Life Sciences, 90-130 students, sub-module of 2 hours contact time total
- 2010 – present    **Member of the Higher Education Academy**
- 2010                **Guest lecture** “Models of insect olfaction” in “Computational Neuroscience”, MSc level
- 2009 – 2012      **Convener**, Mathematics for Computing, 1st year undergraduate course, 110-130 students, 3 contact hours/week
- 2008                **Guest lecture** “Hybrid Computer-Brain systems (Dynamic Clamp)” in “Computational Neuroscience”, MSc level
- 2008                **Two Guest lectures** “Dynamic Clamp”, in “Advanced Techniques in Cellular and Molecular Neuroscience”, MSc level

### International Teaching

- 2014                **Lecturer in the summer school** of the FLiACT EU ITN network, Centre for Genetic Regulation, Barcelona
- 2011                **Guest lecture** *Olfaction in insects and bio-mimetic machine learning*, Universidad Autónoma de Madrid
- 2009                **Organiser and sole presenter** at the one week workshop/summer school “The Computational Neuroscience of Olfaction”, University of Barcelona
- Organiser and sole presenter** at the one week workshop/summer school “The Computational Neuroscience of Olfaction”, Universidad Autónoma de Madrid

### Previous Teaching Experience at UCSD

- 2006                **Guest lecture** on “The sense of a database approach in computational neuroscience”, in biological sciences division class BGGN 260 “Neurodynamics”
- 2004                **Tutorial** on “Large scale neural simulations in C++” for graduate students at the Institute for Nonlinear Science
- 2003                **Guest lecture** on “Synchronisation and Plasticity”, in class BGGN 260 “Neurodynamics”

### Previous teaching experience at Georg-August Universität Göttingen

- 1996 – 1997      **Teaching assistant** in the lecture “Theoretical mechanics” of Prof. H. Gönner
- 1993 – 1994      **Assistant**, Lecture notes “Theoretical mechanics” with Prof. G. C. Hegerfeldt

## **Department, School and University Contribution**

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### **Contributions at the University of Sussex**

2014 – present	Director of Research and Knowledge Exchange, School of Engineering and Informatics
2012 – present	Member of the steering committee of Sussex Neuroscience
2012 – 2016	Member of the Sussex Neuroscience PhD program committee
2011 – 2015	Academic lead for widening participation, School of Engineering and Informatics
2010 – present	<b>Co-director</b> of the Centre for Computational Neuroscience and Robotics (CCNR) (with Andy Philippides and Paul Graham)
2010 – 2012	<b>Investigating officer</b> , School of Engineering and Informatics
2010 – present	<b>Member of the committee</b> for the EASy/CCNR web appearance
2009	<b>Member of the Informatics committee for restructuring</b> the Mathematics curriculum
2008 – present	<b>Member of the Aimhigher Science, Technology, Engineering and Mathematics (STEM) network</b> East Sussex
2008 – 2012	<b>Named contact in the School of Informatics</b> for the IngenioUS outreach programme
2008 – 2009	<b>Member of the group of “scholars concerned about proposals for restructuring”</b> , delegate of the group at a meeting with VC Michael Farthing

### **Contributions at UCSD**

2002-2007	<b>Network administrator and webmaster</b> of the Institute for Nonlinear Science (shared with two others)
2002	<b>Host of the seminar series</b> “Dynamics of Nervous Systems”

### **Contributions at Universität Leipzig**

1999 – 2001	<b>Network administrator</b> of the Institute for Theoretical Physics (in a group of three)
1999 – 2001	<b>Student speaker of the graduate program</b> “Quantenfeldtheorie: Mathematische Struktur und ihre Anwendungen in der Elementarteilchen und Festkörperphysik.”
1999 – 2001	<b>Student member of the advisory board</b> for appointments to the Leibniz professorship.

### **Contributions at Georg-August Universität Göttingen**

1997 – 1998	<b>Student representative</b> on the executive board of the Institute for Theoretical Physics.
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## Memberships and Networks

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2010 – 2015	“Champion” of the special interest group “Modelling and Simulation Environments” in the UK INCF (“International Neuroinformatics Coordinating Facility”) node.
2010 – present	Member of the Higher Education Academy
2008 – present	Member of the UK Neuroinformatics Network
2008 – present	Member of the Aimhigher Science, Technology, Engineering and Mathematics (STEM) network East Sussex
2007 – 2009	Associate member of the European Network of Excellence in Artificial Olfaction (GOSPEL)
2004 – present	Member of the Society for Neuroscience
1997 – 2004	Member of the European Physical Society
1997 – 2014	Member of the German Physical Society (“Deutsche physikalische Gesellschaft”)

## Business, Enterprise and the Community

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2017	<p>Delegate at the Huxley summit, British Science Foundation</p> <p>Contributions to the British Science festival: Outreach session in North Laines Brewhouse and participation in the “driverless cars” round-table</p> <p>Presentation at the “Digi Drop-in”, Wired Sussex, Fusebox, New England House, Brighton</p>
2016	<p>Grant application with Ambiental, Sussex Innovation centre</p> <p>Hacking the senses outreach event, London</p> <p>Presentation at the International Drone Day, Brighton</p> <p>Visit to “X”, Mountainview, CA. Presentation at the X science fair</p>
2014	<p>Hosted visit of Ittai Flascher, Intel - led to subsequent funding from Intel (PIs Husbands, Philippides, Buckley)</p> <p>Visit to Owlstone, Cambridge (manufacturers of the LoneStar enose, among other products)</p>
2014 – present	<p>Regular contributions to “Big Bang South East” outreach events, <a href="https://nearme.thebigbangfair.co.uk/regions/704">https://nearme.thebigbangfair.co.uk/regions/704</a></p>
2013 – present	TV and radio contributions
2008 – 2009	Participant in the Member of Parliament (MP) – Scientist pairing programme of the Royal Society; with Brighton MP Dr. Desmond Turner
2008 – present	Public science talks, including Café Scientifique, Nerd Nite, U3A science talk, bee keeper’s convention
2008 – present	Development of outreach demonstrators and delivery to the general public: Ant pheromone trails, <a href="http://users.sussex.ac.uk/~tn41/outreach.php">http://users.sussex.ac.uk/~tn41/outreach.php</a>

- Bee pilot virtual reality bee vision demonstrator (with Lucas Wilkins),  
<http://www.lucaswilkins.com/beepilot/>
- Swarming simulator (with James Thorniley),  
<http://sussexsim.appspot.com/>
- Spiking neuron simulator (with Daniel Hellowell),  
<http://users.sussex.ac.uk/~tn41/HHNeuronHellowell/index.html>
- 2008 – present      **Science, Technology, Engineering and Maths (STEM) Ambassador**, including numerous outreach events for school children organised at the University of Sussex
- 2008 – 2010        **Joint grant proposal with Neurorobotics**, a startup company at the Sussex Innovation Centre
- 2007 – 2014        **Joint EU grant proposals with g.tec** (Guger Technologies), Austria

## Journal Publications

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1. J. C. Knight and **T. Nowotny** (2018) *GPUs Outperform Current HPC and Neuromorphic Solutions in Terms of Speed and Energy When Simulating a Highly-Connected Cortical Model*. Front. Neurosci., doi: 10.3389/fnins.2018.00941
2. H. K. Chan, F. Hersperger, E. Marachlian, B. H. Smith, F. Locatelli, P. Szyszka and **T. Nowotny** (2018) *Odorant mixtures elicit less variable and faster responses than pure odorants*. PLoS Comp. Biol., doi: 10.1371/journal.pcbi.1006536
3. I. Blundell, R. Brette, T. A. Cleland, T. G. Close, D. Coca, , A. P. Davison, S. Diaz Pier, C. Fernandez Musoles, P. Gleeson, D. F. Goodman, M. Hines, M. W. Hopkins, P. Kumbhar, D. R. Lester, B. Marin, A. Morrison, E. Müller, **T. Nowotny**, A. Peyser, D. Plotnikov, P. Richmond, A. Rowley, B. Rumpe, M. Stimberg, A. B. Stokes, A. Tomkins, G. Trenschi, M. Woodman and J. M. Eppler (2018) *Code generation in computational neuroscience: a review of tools and techniques*. Front. Neuroinform., doi: 10.3389/fninf.2018.00068
4. M. Perez, **T. Nowotny**, P. d’Ettorre, M. Giurfa (2016) *Olfactory experience shapes the evaluation of odour similarity in ants: a behavioural and computational analysis*. Proc. R. Soc. B 283: 20160551, doi: 10.1098/rspb.2016.0551
5. G. Wu, **T. Nowotny**, Y. Zhang, H.-Q. Yu, D. Day-Uei Li (2016) *Artificial neural network approaches for fluorescence lifetime imaging techniques*. Optics Letters 41(11):2561-2564, doi: 10.1364/OL.41.002561
6. H. K. Chan, D.-P. Yang, C. Zhou, **T. Nowotny** (2016) *Burst firing enhances neural output correlation*. Front. Comput. Neurosci. 10:00042, doi: 10.3389/fncom.2016.00042
7. A. Diamond, M. Schmuker, A. Z. Berna, S. Trowell, **T. Nowotny** (2016) *Classifying continuous, real-time e-nose sensor data using a bio-inspired spiking network modelled on the insect olfactory system*. Bioinspiration & Biomimetics 11(2):026002, doi: 10.1088/1748-3190/11/2/026002
8. E. Yavuz, J. Turner and **T. Nowotny** (2016) *GeNN: a code generation framework for accelerated brain simulations*. Scientific Reports 6:18854, doi: 10.1038/srep18854

9. G. Wu, **T. Nowotny**, Y. Chen, and D. D.-U. Li (2016) *GPU acceleration of time-domain fluorescence lifetime imaging*. J. Biomed. Optics 21(1):017001, doi: 10.1117/1.JBO.21.1.017001
10. A. Diamond, **T. Nowotny**, M. Schmuker (2015) *Comparing neuromorphic solutions in action: implementing a bio-inspired solution to a benchmark classification task on three parallel-computing platforms*. Front. Neurosci. 9:491, doi: 10.3389/fnins.2015.00491
11. **T. Nowotny**, M. de Bruyne, A. Z. Berna, C. G. Warr and S. C. Trowell (2014) *Drosophila olfactory receptors as classifiers for volatiles from disparate real world applications*. Bioinspir. Biomim. 9:046007, doi:10.1088/1748-3182/9/4/046007
12. **T. Nowotny** (2014) *Two challenges of correct validation in pattern recognition*. Front. Robotics & AI 1: 5, doi: 10.3389/frobt.2014.00005
13. D. Samu, A. K. Seth, **T. Nowotny** (2014) *Influence of Wiring Cost on the Large-Scale Architecture of Human Cortical Connectivity*. PLoS Comput. Biol. 10(4):e1003557, doi: 10.1371/journal.pcbi.1003557
14. X. R. Wang, J. T. Lizier, **T. Nowotny**, A. Z. Berna, M. Prokopenko, S. C. Trowell (2014) *Feature Selection for Chemical Sensor Arrays Using Mutual Information*. PLoS ONE 9(3):e89840, doi: 10.1371/journal.pone.0089840
15. **T. Nowotny**, J.-P. Rospars, D. Martinez, S. Elbanna, S. Anton (2013) *Machine learning for automatic prediction of the quality of electrophysiological recordings*. PLoS ONE 8(12): e80838, doi: 10.1371/journal.pone.0080838
16. E. Serrano, **T. Nowotny**, R. Levi, B. H. Smith, R. Huerta (2013) *Gain control network conditions in early sensory coding*. PLoS Comput. Biol. 9:e1003133, doi: 10.1371/journal.pcbi.1003133
17. **T. Nowotny**, J. S. Stierle, C. G. Galizia, P. Szyszka (2013) *Data-driven honeybee antennal lobe model suggests how stimulus-onset asynchrony can aid odour segregation*. Brain Research 1536:119-134, doi:10.1016/j.brainres.2013.05.038
18. **T. Nowotny**, A. Z. Berna, R. Binions, S. Trowell (2013) *Optimal feature selection for classifying a large set of chemicals using metal oxide sensors*. Sensors and Actuators B 187:471-480, doi: 10.1016/j.snb.2013.01.088
19. D. Samu, V. Marra, I. Kemenes, M. Crossley, G. Kemenes, K. Staras, **T. Nowotny** (2012) *Single electrode dynamic clamp with StdpC*. J. Neurosci. Meth. 211(1):11-21, doi: 10.1016/j.jneumeth.2012.08.003
20. C. A. Harris, C. L. Buckley, **T. Nowotny**, P. A. Passaro, A. K. Seth, G. Kemenes, M. O'Shea (2012) *Multi-Neuronal Refractory Period Adapts Centrally Generated Behaviour to Reward*. PLoS ONE 7(7):e42493, doi:10.1371/journal.pone.0042493
21. R. Huerta, **T. Nowotny** (2012) *Bio-inspired solutions to the challenges of chemical sensing*. Frontiers in Neuroengineering 5:24, doi: 10.3389/fneng.2012.00024
22. R. Huerta, S. Vembu, J. M. Amigó, **T. Nowotny**, C. Elkan (2012) *Inhibition in Multiclass Classification*. Neural Comput. 24(9):2473-2507, doi: 10.1162/NECO\_a\_00321

23. A. Grémiaux, **T. Nowotny**, D. Martinez, P. Lucas, J.-P. Rospars (2012) *Modelling the Signal Delivered by a Population of First-Order Neurons in a Moth Olfactory System*. Brain Res. 1434:123-35, doi: 10.1016/j.brainres.2011.09.035
24. C. L. Buckley, **T. Nowotny** (2011) *Transient Dynamics between Displaced Fixed Points: An Alternate Nonlinear Dynamical Framework for Olfaction*. Brain Res. 1434:62-72, doi: 10.1016/j.brainres.2011.07.032
25. H. Belmabrouk, **T. Nowotny**, J.-P. Rospars, D. Martinez (2011) *Interaction of cellular and network mechanisms for efficient pheromone coding in moths*. Proc. Natl. Acad. Sci. USA 108(49):19790-5, doi: 10.1073/pnas.1112367108
26. P. Ashwin, Ö. Karabacak, **T. Nowotny** (2011) *Criteria for robustness of heteroclinic cycles in neural microcircuits*. J. Math. Neurosci. 1:13, doi: 10.1186/2190-8567-1-13
27. C. L. Buckley, **T. Nowotny** (2011) *Multi-scale model of an inhibitory network shows optimal properties near bifurcation*. Phys. Rev. Lett. 106:238109, doi: 10.1103/PhysRevLett.106.238109
28. M. Papadopoulou, S. Cassenaer, **T. Nowotny**, G. Laurent (2011) *Normalization for Sparse Encoding of Odors by a Wide-Field Interneuron*, Science 332(6030):721-725, doi: 10.1126/science.1201835
29. **T. Nowotny**, M. K. Muezzinoglu, R. Huerta (2011) *Bio-mimetic classification on modern parallel hardware: Realizations on NVidia<sup>®</sup> CUDA<sup>™</sup> and OpenMP<sup>™</sup>*. Int. J. Inn. Comput. 7(7A):3825-3838
30. I. Kemenes, V. Marra, M. Crossley, D. Samu, K. Staras, G. Kemenes, **T. Nowotny** (2011) *Dynamic clamp with StpC software*. Nature Prot. 6(3):405-417, doi: 10.1038/nprot.2010.200
31. A. Zavada, C. L. Buckley, D. Martinez, J.-P. Rospars, **T. Nowotny** (2011) *Competition-based model of pheromone component ratio detection in the moth*. PLoS ONE 6(2):e16308, doi: 10.1371/journal.pone.0016308
32. A. Szücs, F. Berton, **T. Nowotny**, P. Sanna, W. Francesconi (2010) *Consistency and Diversity of Spike Dynamics in the Neurons of Bed Nucleus of Stria Terminalis of the Rat: A Dynamic Clamp Study*. PLoS ONE 5(8):e11920, doi: 10.1371/journal.pone.0011920
33. R. Huerta, **T. Nowotny** (2009) *Fast and Robust Learning by Reinforcement Signals: Explorations in the Insect Brain*. Neural Comput. 21(8):2123-2151, doi: 10.1162/neco.2009.03-08-733
34. **T. Nowotny**, R. Levi, A. I. Selverston (2008) *Probing the Dynamics of Identified Neurons with a Data-Driven Modeling Approach*. PLoS ONE 3(7):e2627, doi: 10.1371/journal.pone.0002627
35. **T. Nowotny**, R. Huerta, M. I. Rabinovich (2008) *Neuronal synchrony: Peculiarity and generality*. Chaos 18:037119, doi: 10.1063/1.2949925
36. M. V. Ivanchenko, **T. Nowotny**, A. I. Selverston, M. I. Rabinovich (2008) *Pacemaker and Network Mechanisms of Rhythm Generation: Co-operation and Competition*. J Theor Biol 3(7):452-461, doi: 10.1016/j.jtbi.2008.04.016

37. **T. Nowotny**, A. Szücs, R. Levi, A. I. Selverston (2007) *Models wagging the dog: Are circuits constructed with disparate parameters?* *Neural Comput.* 19:1985-2003, doi: 10.1162/neco.2007.19.8.1985
38. **T. Nowotny**, M. I. Rabinovich (2007) *Dynamical origin of independent spiking and bursting activity in neural microcircuits.* *Phys Rev Lett* 98:128106, doi: 10.1103/PhysRevLett.98.128106
39. **T. Nowotny**, M. Requardt (2007) *Emergent Properties in Structurally Dynamic Disordered Cellular Networks.* *J Cell Automata* 2(4):273-289
40. J. S. Haas, **T. Nowotny**, H. D. I. Abarbanel (2006) *Spike-timing dependent plasticity of inhibitory synapses in the entorhinal cortex.* *J. Neurophysiol.* 96(6):3305-3313, doi: 10.1152/jn.00551.2006
41. **T. Nowotny**, A. Szücs, R. D. Pinto, A. I. Selverston (2006) *StdpC: A modern Dynamic Clamp* *J. Neurosci. Meth.* 158(2):287-299, doi: 10.1016/j.jneumeth.2006.05.034
42. **T. Nowotny**, R. Huerta, H. D. I. Abarbanel, M. I. Rabinovich (2005) *Self-organization in the olfactory system: One shot odor recognition in insects.* *Biol. Cybern.* 93(6):436-446, doi: 10.1007/s00422-005-0019-7
43. R. Huerta, **T. Nowotny**, M. García-Sánchez, H. D. I. Abarbanel, M. I. Rabinovich (2004) *Learning classification in the olfactory system of insects* *Neural Comput.* 16(8):1601-1640, doi: 10.1162/089976604774201613
44. **T. Nowotny**, R. Huerta (2003) *Explaining synchrony in feedforward networks: Are McCulloch-Pitts neurons good enough?* *Biol. Cybern.* 89(4):237-241, doi: 10.1007/s00422-003-0431-9
45. **T. Nowotny**, V. P. Zhigulin, A. I. Selverston, H. D. I. Abarbanel, M. I. Rabinovich (2003) *Enhancement of synchronization in a hybrid neural circuit by spike timing dependent plasticity.* *J. Neurosci.* 23(30):9776-9785
46. **T. Nowotny**, M. I. Rabinovich, R. Huerta, H. D. I. Abarbanel (2003) *Decoding temporal information through slow lateral excitation in the olfactory system of insects.* *J. Comput. Neurosci.* 15:271-281, doi: 10.1023/A:10258251
47. **T. Nowotny**, M. I. Rabinovich, H. D. I. Abarbanel (2003) *Spatial representation of temporal information through spike timing dependent plasticity.* *Phys Rev E* 68:011908, doi: 10.1103/PhysRevE.68.011908
48. **T. Nowotny**, H. Patzlaff, U. Behn (2002) *Phase diagram of the random field Ising model on the Bethe lattice.* *Phys Rev E* 65:016127, doi: 10.1103/PhysRevE.65.016127
49. **T. Nowotny**, U. Behn (2001) *Convolution of multifractals and the local magnetization in a random field Ising chain.* *J Phys A* 34:8057-8079, doi: 10.1088/0305-4470/34/39/308
50. **T. Nowotny**, H. Patzlaff, U. Behn (2001) *Orbits and phase transitions in the multifractal spectrum.* *J Phys A* 34:1-23, doi: 10.1088/0305-4470/34/1/301



51. **T. Nowotny**, M. Requardt (1999) *Pregeometric Concepts on Graphs and Cellular Networks as Possible Models of Space-Time at the Planck-Scale*. *Chaos Soliton Fract.* 10:469-481, doi: 10.1016/S0960-0779(98)00091-5
52. **T. Nowotny**, M. Requardt (1998) *Dimension Theory of Graphs and Networks*. *J Phys A* 31:2447-2463, doi: 10.1088/0305-4470/31/10/018

## **Theses and Book Chapters**

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53. P. Varona, D. A. Guardedeño, **T. Nowotny**, f. B. Rodríguez (2016) *Online event detection requirements in closed-loop neuroscience* In: *Closed Loop Neuroscience*, Ahmed El Hady editor, Academic Press, pp. 81-91. ISBN 978-0-12-802452-2, doi: 10.1016/C2014-0-03144-9
54. **T. Nowotny**, P. Benjamin (2015) *Gap Junctions in Small Networks*. *Encyclopedia of Computational Neuroscience*, Springer, New York, doi: 10.1007/978-1-4614-6675-8\_455
55. **T. Nowotny**, V. Marra (2015) *Patch Clamp Technique*. *Encyclopedia of Computational Neuroscience*, Springer, New York, doi: 10.1007/978-1-4614-7320-6\_133-3
56. **T. Nowotny**, R. Levi (2015) *Voltage Clamp Technique*. *Encyclopedia of Computational Neuroscience*, Springer, New York, doi: 10.1007/978-1-4614-6675-8\_137
57. **T. Nowotny**, P. Varona (2012) *Dynamic Clamp*. *Encyclopedia of Nanotechnology*, Bhushan, Bharat (Ed.), Part 5, Springer, pp. 613-621, doi: 10.1007/978-90-481-9751-4\_223
58. **T. Nowotny**, M. I. Rabinovich (2011) *Pacemaker and Network Mechanisms of Neural Rhythm Generation*. in "Modern Pacemakers - Present and Future". InTech, Vienna, pp. 405-425
59. **T. Nowotny** (2009) "Sloppy engineering" and the olfactory system of insects. in *Biologically Inspired Signal Processing for Chemical Sensing*, Marco, Santiago; Gutiérrez, Agustín (Eds.) *Studies in Computational Intelligence*, Vol. 188, pp. 3-32, Springer
60. **T. Nowotny** (2001) *Phase transitions and multifractal properties of random field Ising models* PhD Dissertation, Universität Leipzig, 132 pages
61. **T. Nowotny** (1998) *Untersuchung geometrischer Strukturen in zellularen Netzwerken und Graphen im Hinblick auf eine Beschreibung der Feinstruktur der physikalischen Raumzeit auf der Planckskala*. Diplomarbeit, Georg-August Universität Göttingen, 116 pages

## **Reviewed Conference Papers**

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62. N. Domcsek, J. Knight, **T. Nowotny** (2018) *Autonomous robot navigation using GPU enhanced neural networks*, in press
63. H. K. Chan, **T. Nowotny** (2017) *A Biophysical Model of the Early Olfactory System of Honeybees*. In: Liu D., Xie S., Li Y., Zhao D., El-Alfy ES. (eds) *Neural Information Processing. ICONIP 2017. Lecture Notes in Computer Science*, vol 10637. Springer, Cham, doi: 10.1007/978-3-319-70093-9\_68

64. E. Yavuz, **T. Nowotny** (2016) *Input-Modulation as an Alternative to Conventional Learning Strategies*. In: Villa A., Masulli P., Pons Rivero A. (eds) *Artificial Neural Networks and Machine Learning – ICANN 2016*. Lecture Notes in Computer Science, vol 9886. Springer, Cham, doi: 10.1007/978-3-319-44778-0\_7
65. **T. Nowotny**, R. Huerta (2012) *On the Equivalence of Hebbian Learning and the SVM Formalism*. CISS, Princeton
66. **T. Nowotny**, A. Berna, R. Binions, S. Trowell (2012) *Optimal Feature Selection for Classifying a Large Set of Chemicals Using Metal Oxide Sensors*. IMCS Conference, Nürnberg
67. **T. Nowotny** (2010) *Parallel Implementation of a Spiking Neuronal Network Model of Unsupervised Olfactory Learning on NVidia® CUDA™*. WCCI (IJCNN) Barcelona, doi: 10.1109/IJCNN.2010.5596358
68. M. K. Muezzinoglu, **T. Nowotny**, R. Huerta (2008) *Artificial Olfactory Brain for Mixture Identification*. Advances in Neural Information Processing Systems 21 (NIPS 2008)

## Software Packages

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69. **T. Nowotny**, M. Stimberg, D. Goodman (2017) Brian2GeNN: Interface between the Brian 2 simulator and GeNN,  
<https://github.com/brian-team/brian2genn>
70. **T. Nowotny**, E. Yavuz, J. Turner, J. Knight (2011) GeNN (GPU enhanced neuronal networks): Framework for code-generation based neuronal network simulations in NVIDIA® CUDA™,  
<https://github.com/genn-team/genn>
71. **T. Nowotny**, N. Mather (2005) NeurAnim: Animation software for large scale neuronal network simulations ,  
<http://sourceforge.net/projects/neuranim/>
72. **T. Nowotny**, D. Samu, F. Kern (2003) StdpC (Spike timing dependent plasticity Clamp): Dynamic clamp software,  
<https://github.com/tnowotny/stdpc>

## Invited Keynotes and Invited Workshop Presentations

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1. H. K. Chan, **T. Nowotny**. Biophysical model of the olfactory system of honey bees predicts qualitatively different responses to mixtures, Columbia Workshop on Brain Circuits, Memory and Computation (BCMC 2018), Columbia University, New York, **invited talk**.
2. H. K. Chan, F. Hersperger, E. Marachlian, B. H. Smith, F. Locatelli, P. Szyszka, **T. Nowotny**. Mixtures are more robust stimuli in olfaction, ISCE 2018 Budapest, **invited talk**.
3. **T. Nowotny**. Chalk Talk on “Odor Objects”, Capocaccia workshop 2017, Alghero, Sardinia, 26 April, 2017, **invited talk**.
4. **T. Nowotny**. Bio-inspired computing and control, BrightonSEO, Brighton, 7 April 2017, **invited talk**.

5. **T. Nowotny**, H. K. Chan, A. Diamond, The early olfactory code in bees. Neural Coding Workshop 2016, Köln, 28 August 2016, **invitation only international workshop**.
6. **T. Nowotny**. Network model of the antennal lobe of the bee suggests how the fine structure of odor plumes could help odor-object recognition, workshop “Dynamical principles in Neural circuits”, CNS 2016, Jeju Island, South Korea, 6 July 2016, **invited talk**.
7. A. Diamond, **T. Nowotny**, M. Schmuker, Comparing Neuromorphic Solutions in Action, NICE workshop, Berkeley, USA, 7 March 2016, **invited talk**.
8. **T. Nowotny**, H. K. Chan, G. C. Galizia, P. Szyszka. Models of odor-background segregation in honey bee. Environmental Sensing and Animal Behavior (ESAB 2016), RCAST, University of Tokyo, 11 June 2016, **invited talk**.
9. **T. Nowotny**. Making Models that tolerate diversity. HBP SP3/SP9 workshop, EITN Paris, 4 April 2015, **invited talk**.
10. **T. Nowotny**. Exploring Neural Mechanisms of Odor Object Segregation in Computational Models; Where are we with computational models - and where do we want to be? Eleventh Göttingen Meeting of the German Neuroscience Society, Göttingen, 20 March 2015, **invited symposium talk**.
11. **T. Nowotny**. Leveraging Code Generation for Simulating Spiking Neuronal Network Models on GPUs with GeNN. INCF Code generation workshop, EITN Paris 9 December 2014, **invited talk**.
12. **T. Nowotny**. Green Brain: Modeling the honeybee brain, Invertebrate Neurobiology Meeting, Toulouse, 22 May 2014, **invited talk**.
13. **T. Nowotny**. GeNN: Accelerating spiking neuronal networks on GPU hardware. NC<sup>3</sup>I symposium, CSIRO Marsfield, Sydney, Australia, 11 April 2014, **invited keynote**.
14. **T. Nowotny**. Online Parameter Estimation using GPU super-computing. Neural Coding Workshop 2014, Versailles. **invitation only international workshop**.
15. **T. Nowotny**. GPU enhanced neuronal networks (GeNN): Overview and New Developments. Workshop on super-computing, University of Cambridge, 19 December 2013, **invited talk**.
16. **T. Nowotny**. How the fine spatio-temporal structure of the odour plume may help bees to recognize odour objects. International IPCog workshop, Sydney, 28 February, 2013, **invited keynote**.
17. **T. Nowotny**, C. G. Galizia, P. Szyszka. Coding of temporally incoherent odour mixtures in the antennal lobe of honeybees. Neural Coding Workshop, Prague, 04 September, 2012, **invitation only international workshop**.
18. **T. Nowotny**, P. Szyszka, C. G. Galizia. Incoherent mixture coding in the honeybee antennal lobe. CNS workshop on dynamics in olfaction, Atlanta-Decatur, 26 July, 2012, **invited international workshop presentation**.
19. **T. Nowotny**. Central patterns generation with heteroclinic orbits. CNS workshop on pattern generation, Atlanta-Decatur, 26 July, 2012, **invited international workshop presentation**.

20. **T. Nowotny.** GeNN: using code generation for GPU programming, G-node Workshop on GPU Computing, Munich, 11 April, 2012, **invited keynote.**
21. **T. Nowotny.** The Feature Selection Problem for Artificial Noses, 2nd Australasian workshop on computation in cyber-physical systems, Sydney (2011), **invited keynote.**
22. **T. Nowotny.** Winnerless competition in a network of Hodgkin-Huxley neurons, “Living Non-linear Dynamics” birthday symposium for Mikhail I. Rabinovich, San Diego (2011), **invitation only international workshop**
23. **T. Nowotny.** Ratio Coding and Dynamic Range: Lessons from the Moth Pheromone System. Workshop on Bioinspired computation for chemical sensing, Barcelona, **invited international workshop presentation** (2011)
24. A. Zavada, C. L. Buckley, **T. Nowotny.** Neural coding in the olfactory system of insects, *Neural Coding*, Limassol, Cyprus (2010), **invitation only international workshop**
25. **T. Nowotny.** The different roles of sparse activity and sparse connectivity for pattern recognition in the olfactory system of insects, *Computational Neuroscience Conference (CNS) workshop on insect olfaction*, Berlin (2009), **invited international workshop presentation**
26. **T. Nowotny**, A. Szücs, R. Levi and A. I. Selverston. Homoeostasis versus neuronal variability: Models and experiments in crustaceans, *Comp Biochem Physiol A* 153A(2), S154-S155, *SEB Conference*, Glasgow (2009), **invited symposium presentation**
27. **T. Nowotny.** Learning pattern classification from the olfactory system of insects, International Workshop on Biotechnology, Skokloster, Sweden (2008), **invited international workshop presentation**
28. **T. Nowotny**, D. Martinez, J.-P. Rospars. Sensitivity, specificity and ratio coding: Riddles of the pheromone system in moths, BBSRC ISB Grantholder workshop, Nottingham (2008), **invited grant holders only**
29. **T. Nowotny**, R. Levi, A. I. Selverston. Can we build dynamically accurate conductance based models to investigate the origin of bursting? *Conference on “The Dynamical Origin of Bursting”*, Georgia State University, Atlanta (2006), **invited international workshop presentation**
30. **T. Nowotny.** Self-organization in the olfactory system? Fast odor recognition in insects, *Exploratory ESF Workshop on Insect Mushroom Bodies*, Seix (2004), **invitation only think tank, invited keynote**
31. **T. Nowotny**, V. P. Zhigulin, M. I. Rabinovich. Enhancement of Neural Synchronization by Activity Dependent Coupling, *50th Annual SIAM Conference*, Philadelphia (2002), **invited international workshop presentation**
32. **T. Nowotny.** Representation, transformation, and storage of temporal information in neuronal systems, *International Symposium on Topical Problems of Nonlinear Wave Physics*, Wolga River (2003), **invited symposium presentation**

## Conference Contributions and Abstracts

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1. J. C. Knight, **T. Nowotny**. GPUs outperform current HPC and neuromorphic solutions in terms of speed and energy for a highly-connected cortical model. Workshop on Unconventional Computing, Cambridge 10 October 2018, poster.
2. **T. Nowotny**, E. Vasilaki, A. O. Philippides, P. R. Graham, L. Chittka, M. Juusola, J. A. R. Marshall. Brains on board: Neuromorphic control of flying robots. CNS\*2018 Seattle, poster.
3. J. Knight, A. Cope, **T. Nowotny**. Using GPU enhanced neuronal networks to put real-time brains on board. CNS\*2018 Seattle. Poster presented by James Knight
4. H. K. Chan, **T. Nowotny**. Firing probability for a noisy leaky integrate-and-fire neuron receiving an arbitrary external input signal. CNS\*2018 Seattle. Poster presented by Ho Ka Chan
5. J. Bennett, **T. Nowotny**. Computing reward prediction errors and learning valence in the insect mushroom body. CNS\*2018 Seattle. Poster presented by James Bennett.
6. N. Kogo, F. Kern, **T. Nowotny**, R. van Ee, R. van Wezel, T. Aihara. Levelt's propositions examined at the level of mutually inhibiting pyramidal cells in primary visual cortex. *Journal of Vision* 2018;18(10):537. doi: 10.1167/18.10.537
7. H. K. Chan, **T. Nowotny**. Detection of correlations in input signals with a small neural circuit. 4th International Conference on Mathematical Neuroscience, INRIA, France, 11 June 2018. Poster presented by Ho Ka Chan
8. N. Kogo, F. Kern, **T. Nowotny**, R. van Ee, R. van Wezel, T. Aihara. Temporal dynamics of mutually inhibiting pyramidal cells: underlying mechanism for bi-stable perception. European Conference on Visual Perception ECVP 2017, 28 August 2017. Poster presented by Naoki Kogo
9. H. K. Chan, F. Hersperger, P. Szyszka, **T. Nowotny**. Biophysical model of the olfactory system of honey bees predicts qualitatively different responses to mixtures, Esito Conference, Hotel Cormoran, Sardinia, 19 September 2017, contributed talk
10. H. K. Chan, F. Hersperger, P. Szyszka, **T. Nowotny**. Dynamics in olfactory receptors of honeybees lead to qualitatively different responses to odour mixtures, ECRO Conference 2017, Cambridge, 5 September 2017, talk delivered by H. K. Chan
11. H. K. Chan, **T. Nowotny**. Mixture processing in a biophysical model of the early olfactory system of honeybees, CNS 2017, Antwerp, 16 July 2017, featured oral presentation by H. K. Chan
12. M. Stimberg, D. F. M. Goodman, **T. Nowotny**. Brian2GeNN: Free GPU Acceleration for Brian 2 Users, CNS 2017, Antwerp, 17 July 2017, Poster
13. H. K. Chan, **T. Nowotny**. Odor processing in a biophysical model of the early olfactory system of honeybees, The 3rd International Conference on Mathematical Neuroscience, Boulder, CO, 1 June 2017, Poster presented by H. K. Chan
14. J. P. Turner, **T. Nowotny**. Numerical Error of Spiking Neural Network Simulations on GPUs, GPU Technology Conference 2017, San Jose, 8 May 2017, Poster presented by J. P. Turner
15. **T. Nowotny**, J. P. Turner, E. Yavuz, GeNN: Accelerated spiking neural network simulations on GPUs, GPU Technology Conference 2017, San Jose, 8 May 2017, Poster

16. F. B. Kern, N. Kogo, **T. Nowotny**. Implementing hybrid circuits with StdpC, a flexible, easy-to-use Dynamic Clamp software, BNA Festival of Neuroscience, Birmingham, 11 April 2017, Poster presented by F. B. Kern
17. **T. Nowotny**, E. Yavuz, J. Turner, Accelerated brain simulations with GeNN, BNA Festival of Neuroscience, Birmingham, 11 April 2017, Poster
18. D. Price, M. Crossley, G. Kemenes, **T. Nowotny**, I. Kemenes, A previously unidentified parietal neuron promotes feeding in *Lymnaea stagnalis*, BNA Festival of Neuroscience, Birmingham, 10 April 2017, Poster presented by D. Price
19. E. Yavuz, **T. Nowotny**. Input-Modulation as an Alternative to Conventional Learning Strategies. ICANN 2016 Barcelona, 9 September, 2016, Poster presented by E. Yavuz
20. **T. Nowotny**, J. P. Turner, E. Yavuz. GeNN: Accelerated spiking neural network simulations on GPUs. SfN Conference 2016, San Diego, 12 November, 2016, Poster
21. D. Price, M. Crossley, G. Kemenes, P. R. Benjamin, **T. Nowotny**, I. Kemenes, Role of modulatory interneurons in memory lapses during consolidation after single-trial reward conditioning. SfN Conference 2016, San Diego, 15 November, 2016, Poster presented by D. Price
22. J. P. Turner, **T. Nowotny**. Easy-to-use GPU acceleration of neural network simulations with GeNN. INCF Congress 2016, Reading, 3 September 2016, Talk presented by J. P. Turner
23. E. Yavuz, **T. Nowotny**. Simulating a biologically accurate model of the honeybee olfactory system on the GPU. INCF Congress 2016, Reading, 3 September 2016, Poster presented by E. Yavuz
24. P. Szyszka, **T. Nowotny**, B. H. Smith, R. Kanzaki, Odor-background segregation and source localization using fast olfactory processing, HFSP grant holder meeting, Singapore, 12 July 2016, Poster
25. D. Sasaka, **T. Nowotny**. Methods for building accurate neuron models of individual neurons. CNS Conference 2016, Jeju Island, 4 July 2016, Poster presented by D. Sasaka
26. H. K. Chan, A. Diamond, **T. Nowotny**. A full size mathematical model of the early olfactory system of honeybees. CNS Conference 2016, Jeju Island, 4 July 2016, Poster presented by H. K. Chan
27. H. K. Chan, A. Diamond, **T. Nowotny**. A full size mathematical model of the early olfactory system of honeybees. Environmental Sensing and Animal Behavior (ESAB 2016), RCAST, University of Tokyo, 11 June 2016. Contributed talk presented by H. K. Chan
28. **T. Nowotny**, M. de Bruyne, A. Z. Berna, C. G. Warr, S. C. Trowell. Broadly tuned *Drosophila* olfactory receptor responses allow recognition of a wide range of volatiles. International Symposium on Olfaction and Taste (ISOT 2016), Yokohama, Japan. Poster
29. A. Diamond, M. Schmuker, A. Berna, S. C. Trowell, **T. Nowotny**. Continuous odour detection combining an e-nose with a spiking neural model based on the insect olfactory system. International Symposium on Olfaction and Taste (ISOT 2016), Yokohama, Japan. Poster presented by A. Diamond

30. H. K. Chan, A. Diamond, **T. Nowotny**. A full size mathematical model of the early olfactory system of honeybees. International Symposium on Olfaction and Taste (ISOT 2016), Yokohama, Japan. Poster presented by H. K. Chan
31. H. K. Chan, **T. Nowotny**. Discriminating between correlated and uncorrelated signals with a small neural circuit, Dynamics Days, 9<sup>th</sup> Dynamics Days Asia Pacific (DDAP9), Hong Kong, 15 December 2016. Talk delivered by H. K. Chan
32. **T. Nowotny**. Online Parameter Estimation using GPU super-computing. Eleventh Göttingen Meeting of the German Neuroscience Society, Göttingen, 20 March 2015. Poster
33. E. Yavuz, A. Cope, L. Meah, C. Sabo, K. Gurney, J. Marshall, E. Vasilaki, **T. Nowotny**. Towards real-time models of full-size insect brains using GPU-enhanced Neural Network Simulations (GeNN). Invertebrate Neurobiology Meeting, Toulouse. Poster
34. **T. Nowotny**. Closed loop electrophysiology. Workshop on closed loop interaction, AIMS Madrid, 10 July 2014. Contributed talk
35. **T. Nowotny**, E. Vasilaki, J. Marshall, Workshop 6, Green Brain: How models of invertebrate brains can inform our understanding of cognition. Bernstein Conference 2014, Göttingen, Organiser of symposium
36. A Diamond, M Schmuker, AZ Berna, S Trowell, **T. Nowotny**. Classifying chemical sensor data using GPU-accelerated bio-mimetic neuronal networks based on the insect olfactory system. CNS Conference 2014, Quebec City, 28 July 2014. Poster presented by A Diamond; BMC Neuroscience 15 (Suppl 1), P77, doi:10.1186/1471-2202-15-S1-P77
37. **T. Nowotny**, AJ Cope, E Yavuz, M Stimberg, DFM Goodman, J Marshall, Kevin Gurney, SpineML and Brian 2.0 interfaces for using GPU enhanced Neuronal Networks (GeNN). CNS Conference 2014, Quebec City, 28 July 2014. Poster; BMC Neuroscience 15 (Suppl 1), P148, doi:10.1186/1471-2202-15-S1-P148
38. E Yavuz, J Turner, **T. Nowotny**. Simulating spiking neural networks on massively parallel graphical processing units using a code generation approach with GeNN. CNS Conference 2014, Quebec City, 27 July 2014. Plenary talk presented by E Yavuz; BMC Neuroscience 15 (Suppl 1), O1, doi:10.1186/1471-2202-15-S1-O1
39. E Yavuz, **T. Nowotny**. A modelling framework for the olfactory system of the honeybee using GeNN (GPU enhanced Neuronal Network simulation environment), Flavour 2014, 3 (Suppl 1), P23, doi:10.1186/2044-7248-3-S1-P23
40. **T. Nowotny**, C Giovanni Galizia, Paul Szyszka, Stimulus-onset asynchrony can aid odor segregation. Flavour 2014, 3 (Suppl 1):P12, doi:10.1186/2044-7248-3-S1-P12
41. A. Cope, C. Sabo, E. Yavuz, E. Vasiliki, K. Gurney, **T. Nowotny**, J. A. Marshall. Computational modelling approach to understanding honeybee vision and cognition. 17th Congress of the International Union for the Study of Social Insects (IUSSI), 13-18 July 2014, Cairns, Australia, <http://hdl.handle.net/2123/10859>

42. **T. Nowotny**, Marien de Bruyne, Amalia Z. Berna, Coral G. Warr, Stephen C. Trowell. Olfactory detection and discrimination: Engineering lessons from an insect. Australian Entomological Society Conference 2014, 30 Sept 2014, Canberra, Australia. Talk given by Stephen Trowell
43. T. G. Corcoran, A. Philippides, **T. Nowotny**. A numerical renormalisation group method for the analysis of critical spreading activity in spiking neural networks. CNS Conference 2013, Paris. BMC Neuroscience 14 (Suppl 1), P297, doi:10.1186/1471-2202-14-S1-P297
44. **T. Nowotny**, C. G. Galizia, P. Szyszka. Data-driven honeybee antennal lobe model demonstrates how stimulus-onset asynchrony can aid odor segregation, CNS Conference 2013, Paris. BMC Neuroscience 14 (Suppl 1), P378, doi:10.1186/1471-2202-14-S1-P378
45. A. Cope, C. Sabo, E. Yavuz, K. Gurney, J. Marshall, **T. Nowotny**, E. Vasilaki. The Green Brain Project-Developing a Neuromimetic Robotic Honeybee. Biomimetic and Bio-hybrid Systems, Lecture Notes in Computer Science Volume 8064, 2013, pp 362-363, doi:10.1007/978-3-642-39802-5\_35
46. Amalia Z. Berna, Nadja K.L. Wiziack, Florence Bravo, **T. Nowotny**, Ben Padovan, Stephen Trowell. Development and testing of a patient breath simulator using electronic nose and thermal desorption unit. Breath Summit, Nuernberg (9-12 June). Talk given by Amalia Berna
47. **T. Nowotny**, Stephen Trowell, Marien de Bruyne. Benchmarking Drosophila receptor neurons for technical applications. Poster at the Göttingen Neuroscience Conference (13 Mar 2013)
48. **T. Nowotny**. Central patterns generation with heteroclinic orbits. CNS workshop on pattern generation, Atlanta-Decatur, 26 July, 2012, invited
49. **T. Nowotny**, P. Szyszka, C. G. Galizia. Incoherent mixture coding in the honeybee antennal lobe. CNS workshop on dynamics in olfaction, Atlanta-Decatur, 26 July, 2012, invited
50. **T. Nowotny**, S. Trowell, M. de Bruyne. Benchmarking Drosophila receptor neurons for technical applications. CNS\*2012, Atlanta-Decatur, 24 July, 2012, BMC Neuroscience 2012, 13(Suppl 1):P155 (16 July 2012)
51. **T. Nowotny**, A. Berna, R. Binions, S. Trowell. Optimal Feature Selection for Classifying a Large Set of Chemicals Using Metal Oxide Sensors, IMCS conference, Nürnberg, 21 May, 2012
52. **T. Nowotny**. GeNN: using code generation for GPU programming, G-node Workshop on GPU Computing, Munich, 11 April, 2012, invited keynote
53. **T. Nowotny**. GPU enhanced neuronal networks (GeNN): Why use code generation for programming GPUs? INCF Conference, Edinburgh, 27 March, 2012
54. P. Szyszka, J. Stierle, S. Biergens, **T. Nowotny**, C. G. Galizia. Honeybee neurons use millisecond time-differences in stimulus coherence for odor-object segregation. BC11 : Computational Neuroscience & Neurotechnology Bernstein Conference & Neurex Annual Meeting 2011, Freiburg, Germany, 4-6 Oct, 2011



55. D. Drix, **T. Nowotny**. Optimisation of stimulation patterns for specific questions in electrophysiology experiments: a Python framework, Python in Neuroscience Conference, Paris (2011)
56. F. Baroni, **T. Nowotny**. The effect of intrinsic subthreshold oscillations on the spontaneous dynamics of a ring network with distance-dependent delays, CNS, Stockholm (2011), BMC Neuroscience 2011, 12(Suppl 1):P236 (18 July 2011)
57. T. Corcoran, A. Philippides, **T. Nowotny**. Coarse-grained statistics for attributing criticality to heterogeneous neural networks, CNS, Stockholm (2011), BMC Neuroscience 2011, 12(Suppl 1):P235 (18 July 2011)
58. C. L. Buckley, **T. Nowotny**. Transient Dynamics between Displaced Fixed Points: An Alternate Nonlinear Dynamical Framework for Olfaction, CNS, Stockholm (2011), BMC Neuroscience 2011, 12(Suppl 1):P237 (18 July 2011)
59. **T. Nowotny**. Flexible neuronal network simulation framework using code generation for NVidia® CUDA™. CNS, Stockholm (2011), BMC Neuroscience 2011, 12(Suppl 1):P239 (18 July 2011)
60. D. Drix, **T. Nowotny**. Dynamic Observer: Ion Channel Measurement beyond Voltage Clamp, CNS, Stockholm (2011), BMC Neuroscience 2011, 12(Suppl 1):P238 (18 July 2011)
61. H. Belmabrouk, Y. Gu, **T. Nowotny**, J. P. Rospars, D. Martinez, Role of local inhibition and neuronal properties in a model of the moth macroglomerular complex. Workshop on Bioinspired computation for chemical sensing, Barcelona, Spain, 4 October 2011, <https://hal.inria.fr/hal-00643388>
62. C. Reveley, D. Samu, **T. Nowotny**, A. K. Seth, An iterative set-theoretic approach to extracting consistent anatomical connectivity from the CoCoMac database. *Wiring the Brain*, Powerscourt, Ireland (2011)
63. **T. Nowotny**, C. L. Buckley, A. Zavada, Ratio Coding and Dynamic Range in the Pheromone System of the Moth, Göttingen meeting of the German Neuroscience Society (2011)
64. **T. Nowotny**. Spiking neuronal network model of unsupervised olfactory learning on modern parallel hardware (GPU), *SfN annual meeting*, San Diego (2010)
65. C. L. Buckley, **T. Nowotny**, A. Chaffiol, D. Martinez and J. P. Rospars, Transient and critical “Winner takes all” dynamics in the macro-glomerular complex of the moth, *SfN annual meeting*, San Diego (2010)
66. A. Zavada, C. L. Buckley, D. Martinez, J. P. Rospars, **T. Nowotny**. Minimal model of blend recognition in the moth pheromone system. Dynamical olfaction workshop, Brighton, UK (2010)
67. C. L. Buckley, D. Martinez, J. P. Rospars, A. Chaffiol, **T. Nowotny**. Critical Rate Dynamics Explain the Dynamic Range of the Moth Pheromone System. Dynamical olfaction workshop, Brighton, UK (2010)

68. H. Belmabrouk, Y. Gu, **T. Nowotny**, J. P. Rospars, D. Martinez. A model of the moth macroglomerular complex: interplay between interglomerular inhibition and neuronal intrinsic properties. Dynamical olfaction workshop, Brighton, UK (2010)
69. J. P. Rospars, A. Gremiaux, Y. Gu, D. Jarriault, L. Kostal, P. Lansky, S. Anton, **T. Nowotny**, P. Lucas, D. Martinez. Olfactory receptor neurons: A comparative analysis of their response properties with diverse stimuli in different species. Dynamical olfaction workshop, Brighton, UK (2010)
70. C. L. Buckley, D. Martinez and J. P. Rospars, A. Chaffiol, S. Anton, **T. Nowotny**. Neural criticality and dynamic range in randy Moths, *Neural Coding*, Limassol, Cyprus (2010)
71. C. L. Buckley, **T. Nowotny**. Transient and critical “Winner takes all” dynamics in the macroglomerular complex of the moth, *OCCAM workshop*, Oxford (2010)
72. **T. Nowotny**. A Parallel Implementation of a Biologically Realistic Spiking Neuronal Network Model of Unsupervised Olfactory Learning on Graphical Processing Units. *OCCAM workshop*, Oxford (2010)
73. C. L. Buckley, D. Martinez, J.-P. Rospars, **T. Nowotny**. Transient ‘winner takes all’ dynamics in the pheromone system of the moth, *SfN Annual Meeting*, Chicago (2009)
74. C. L. Buckley, **T. Nowotny**. Extending the Critical Brain Hypothesis to Rate Dynamics: A Case Study of the Antennal Lobe of the Moth, *European Conference of Artificial Life (ECAL)*, Budapest (2009)
75. **T. Nowotny**, M. K. Muezzinoglu, R. Huerta, Feasibility of biomimetic classification on NVidia<sup>®</sup> CUDA<sup>™</sup>, European Conference of Artificial Life (ECAL), Budapest (2009)
76. **T. Nowotny**. The different roles of sparse activity and sparse connectivity for pattern recognition in the olfactory system of insects, *Computational Neuroscience Conference (CNS) workshop on insect olfaction*, Berlin (2009), invited
77. **T. Nowotny**, A. Szücs, R. Levi and A. I. Selverston, Homoeostasis versus neuronal variability: Models and experiments in crustaceans, *Comp Biochem Physiol A* 153A(2), S154-S155, *SEB Conference*, Glasgow (2009), invited.
78. C. L. Buckley, **T. Nowotny**. Moving beyond convergence in the pheromone system of the moth, *Computational Neuroscience Conference (CNS)*, Berlin (2009), BMC Neuroscience 2009, 10(Suppl 1):P187 (13 July 2009)
79. **T. Nowotny**. Divergence alone cannot guarantee stable sparse activity patterns if connections are dense, *Computational Neuroscience Conference (CNS)*, Berlin (2009), BMC Neuroscience 2009, 10(Suppl 1):P188 (13 July 2009)
80. **T. Nowotny**, M. K. Muezzinoglu, R. Huerta, Feasibility of biomimetic classification on NVidia<sup>®</sup> CUDA<sup>™</sup>, *International Symposium on Olfaction and Electronic Nose (ISOEN)*, Brescia (2009)
81. A. Zavada, D. Martinez, J.-P. Rospars, **T. Nowotny**. A neuronal network model for the detection of binary odour mixtures, *Computational and Systems Neuroscience Conference (Cosyne)*, Salt Lake City (2009)

82. **T. Nowotny**, R. Huerta, Can divergent connectivity generate reliable sparse activity patterns? *Computational and Systems Neuroscience Conference (Cosyne)*, Salt Lake City (2009)
83. A. Zavada, D. Martinez, J.-P. Rospars, **T. Nowotny**. A neuronal network model for the detection of binary odour mixtures, *BBSRC ISB Grantholder workshop*, Nottingham (2008)
84. **T. Nowotny**. Learning pattern classification from the olfactory system of insects, International Workshop on Biotechnology, Skokloster, Sweden (2008), invited
85. **T. Nowotny**, D. Martinez, J.-P. Rospars, Sensitivity, specificity and ratio coding: Riddles of the pheromone system in moths, BBSRC ISB Grantholder workshop, Nottingham (2008), invited
86. **T. Nowotny**, M. I. Rabinovich, Dynamical origin of independent spiking and bursting activity in neural microcircuits, *SfN Annual Meeting*, San Diego (2007)
87. **T. Nowotny**. How do we model nervous systems? Lessons from the lobster lateral pyloric (LP) cell, CCNR Workshop, University of Sussex (2007), invited
88. **T. Nowotny**, R. Levi, A. I. Selverston, Can we build dynamically accurate conductance based models to investigate the origin of bursting? *Conference on "The Dynamical Origin of Bursting"*, Georgia State University, Atlanta (2006), invited
89. J. S. Haas, **T. Nowotny**, H. D. I. Abarbanel, Spike Timing-Dependent Plasticity of Inhibitory Synapses in the Entorhinal Cortex: Mechanisms and Function, *SfN Annual Meeting*, Washington DC (2005)
90. **T. Nowotny**, R. Levi, A. I. Selverston, A dynamically faithful conductance-based neuron model of the lobster lateral pyloric neuron, *SfN Annual Meeting*, Washington DC (2005)
91. **T. Nowotny**, R. Levi, A. I. Selverston, A dynamically accurate (faithful?) conductance based neuron model of the lobster lateral pyloric neuron, *Annual STG Meeting Satellite of SfN Annual Meeting*, Washington DC (2005)
92. **T. Nowotny**, J. S. Haas, H. D. I. Abarbanel, STDP of Inhibitory Synapses in the Entorhinal Cortex: II. Implications for network function, *Computational and Systems Neuroscience Conference (Cosyne)*, Salt Lake City (2005)
93. J. S. Haas, **T. Nowotny**, H. D. I. Abarbanel, STDP of Inhibitory Synapses in the Entorhinal Cortex: I. Electrophysiology, *Computational and Systems Neuroscience Conference (Cosyne)*, Salt Lake City (2005)
94. R. Huerta, **T. Nowotny**, M. Garcia-Sanchez, H. D. I. Abarbanel, M. I. Rabinovich, Learning Discrimination and Categorization in the Insect Mushroom Body: I Statistical Analysis, *SfN Annual Meeting*, San Diego (2004)
95. **T. Nowotny**, R. Huerta, H. D. I. Abarbanel, M. I. Rabinovich, Learning Discrimination and Categorization in the Insect Mushroom Body: II Neuron Simulations, *SfN Annual Meeting*, San Diego (2004)

96. A. I. Selverston, M. I. Rabinovich, R. Huerta, **T. Nowotny**, R. Levi, Y. Arshavsky, A. Volkovskii, J. Ayers, R. Pinto (2004) Biomimetic Central Pattern Generators for Robotics and Prosthetics, 2004 IEEE International Conference on Robotics and Biomimetics, Shenyang, pp. 885-888, doi: 10.1109/ROBIO.2004.1521901
97. **T. Nowotny**. Self-organization in the olfactory system? Fast odor recognition in insects, *Exploratory ESF Workshop on Insect Mushroom Bodies*, Seix (2004), invited
98. **T. Nowotny**, R. Huerta. Explaining synchrony in feedforward networks: Are McCulloch-Pitts Neurons Good Enough? *Dynamical Neuroscience XII Satellite of Sfn Annual Meeting*, San Diego (2004)
99. **T. Nowotny**, M. I. Rabinovich, R. Huerta, H. D. I. Abarbanel. Decoding temporal information through slow lateral excitation in the olfactory system of insects, *Sfn Annual Meeting*, New Orleans (2003)
100. **T. Nowotny**. R. Huerta, M. I. Rabinovich, H. D. I. Abarbanel, Classification of odors in the olfactory system of insects, *Computational Neuroscience Conference (CNS)*, Alicante (2003)
101. **T. Nowotny**. Representation, transformation, and storage of temporal information in neuronal systems, *International Symposium on Topical Problems of Nonlinear Wave Physics*, Wolga River (2003), invited
102. **T. Nowotny**, R. Huerta, M. Garcia-Sanchez, M. I. Rabinovich, H. D. I. Abarbanel, Classification of odors in the olfactory system of insects, *Joint Symposium on Neural Computation*, Irvine (2003)
103. **T. Nowotny**, M. I. Rabinovich, H. D. I. Abarbanel, Sequence Learning through Spike Timing Dependent Plasticity, *Sfn Annual Meeting*, Orlando (2002)
104. A. Szücs, **T. Nowotny**, V. P. Zhitulin, M. I. Rabinovich, R. Huerta, H. D. I. Abarbanel, A. I. Selverston, Enhanced Synchronization of Biological and Model Neurons through Spike Timing Dependent Plasticity, *Sfn Annual Meeting*, Orlando (2002)
105. **T. Nowotny**, V. P. Zhitulin, M. I. Rabinovich, Enhancement of Neural Synchronization by Activity Dependent Coupling, *50th Annual SIAM Conference*, Philadelphia (2002), invited
106. **T. Nowotny**, M. I. Rabinovich, H. D. I. Abarbanel, Sequence Learning Through Spike Timing Dependent Plasticity, *Joint Symposium on Neural Computation*, Pasadena (2002)
107. **T. Nowotny**, U. Behn, Multifraktale Charakterisierung der lokalen Magnetisierung im eindimensionalen Zufallsfeld-Ising-Modell, *DPG Frühjahrstagung*, Hamburg (2001)
108. **T. Nowotny**, U. Behn, Diskrete stochastische Dynamik und Phasenübergänge in multifraktalen Spektren, *Workshop Strukturbildung*, Bad Honnef (2001)
109. **T. Nowotny**, H. Patzlaff, U. Behn, Orbits and Phase Transitions in the Multifractal Spectrum, *DPG Frühjahrstagung*, Regensburg (2000)
110. **T. Nowotny**, U. Behn, Random field Ising chain, *CompPhys00*, Leipzig (2000)
111. **T. Nowotny**. 1D random field Ising model, *Workshop on Stochastic Processes*, Oberwolfach (1999)

112. **T. Nowotny**, M. Requardt, Dimension Theory of Graphs and Networks, *DPG Frühjahrstagung*, Regensburg (1998)

## Invited Talks

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1. **T. Nowotny** and J. Knight. GPUs: Useful accelerators for Spiking Neural Network research. CodeJam #9, Palermo, Italy, 28 November 2018
2. **T. Nowotny**. Dynamic Observer – a new method for ion channel characterization. Imperial Neurotechnology Symposium 2018, 11 July 2018
3. **T. Nowotny**. What can we learn from humble insects to build better AI? Professorial Lecture University of Sussex. 18 April 2018
4. **T. Nowotny**. Biophysical model of the olfactory system of honey bees predicts qualitatively different responses to mixtures, University of Hertfordshire, 1 November 2017
5. **T. Nowotny**. Odour Objects and Brains on Board: What we can learn about the brain from humble insects and how to build smarter robots, Alergic seminar series, University of Sussex, 18 October 2017
6. **T. Nowotny**. Biophysical model of the olfactory system of honey bees predicts qualitatively different responses to mixtures, Oxford University, 11 October 2017
7. **T. Nowotny**. Opportunities and challenges for spiking neural networks on GPUs, University of Sheffield, 27 September 2017
8. **T. Nowotny**. Olfactory receptor repertoire in *Drosophila* and generalization of olfactory learning in ants. University of Konstanz, 9 December 2016
9. H. K. Chan, **T. Nowotny**. A step towards understanding odor-background segregation using computation and mathematical analysis. University of Konstanz, 8 December 2016, Talk delivered by H. K. Chan
10. **T. Nowotny**. Closed-loop Computational Electrophysiology. Sussex Neuroscience Talk, 26 January 2015
11. **T. Nowotny**. GPU computing and Closed Loop Electrophysiology. Computing Department, Keele University 12 November 2014
12. **T. Nowotny**. Online Parameter Estimation using GPU super-computing. Work-in-progress seminar, School of Engineering and Informatics, University of Sussex, 3 October, 2014
13. **T. Nowotny**. Drift problems, and corrections, in eNose data. Chemometric Team Seminar series, CSIRO, Black Mountain Laboratories, Canberra, Australia, 10 April 2014
14. **T. Nowotny**. How odor onset delays may help separating odor sources: Experiments with and models of the honeybee. BCI Institute seminar series, UCSD, 7 November, 2013
15. **T. Nowotny**. General purpose GPU computing: Transforming desktops into personal super-computers. Centre for Scientific Computing workshop, University of Sussex, 25 September, 2013

16. **T. Nowotny.** Computational Neuroscience. Neuroscience Away Day and inaugural meeting of Sussex Neuroscience. Brighton, 22 March, 2013
17. **T. Nowotny.** How the fine spatio-temporal structure of the odour plume may help bees to recognize odour objects. Group seminar Prof. Bowman, University of Kent, 20 March, 2013
18. **T. Nowotny.** How the the spatio-temporal structure of odour plumes may help to recognize odour objects. CWI Amsterdam, 13 March 2014
19. **T. Nowotny.** Using code generation to facilitate GPU computing for science applications. Seminar series, University of Plymouth, 26 January, 2014
20. **T. Nowotny.** How the fine spatio-temporal structure of the odour plume may help bees to recognize odour objects. Chemical sensing group, CSIRO Ecosystems Sciences, Canberra, 21 February, 2013
21. **T. Nowotny.** How the fine spatio-temporal structure of the odour plume may help bees to recognize odour objects. Sensory systems group seminar, Research School of Biology, Australian National University, Canberra, 14 February, 2013
22. **T. Nowotny.** Information processing in insect olfaction. Dr. de Bruyne group seminar. Monash University, Melbourne Australia, 31 January, 2013
23. **T. Nowotny.** Information processing in insect olfaction and technical chemical sensing, chemical sensing group, DSTO office Fisherman's Bend, Melbourne Australia, 30 January, 2013
24. **T. Nowotny.** Learning in animals and machines: Lessons from the olfactory system of insects. University of Lübeck, 1 June, 2012
25. **T. Nowotny.** General purpose GPU computing: Transforming your desktop into a personal super-computer, University of Birmingham, 28 February, 2012
26. **T. Nowotny.** Research interests, accomplishments and plans. School of Systems Engineering, University of Reading, 21 August 2012
27. **T. Nowotny** PheroSys Project: Olfactory coding in the insect pheromone pathway: models and experiments, ANR-BBSRC SYSBIO2007 final dissemination event Bath (2011)
28. **T. Nowotny** The Feature Selection Problem for Artificial Noses, invited Keynote, 2nd Australasian workshop on computation in cyber-physical systems, Sydney (2011)
29. **T. Nowotny** Heteroclinic orbits and Displaced Fixed Points: Dynamical Systems Views on Sequential Neuronal Activity, Institute for Neural Engineering, University of Melbourne (2011)
30. **T. Nowotny.** Flexible neuronal network simulation framework using code generation for NVidia<sup>®</sup> CUDA<sup>™</sup>, CARMEN consortium workshop, Newcastle (2011)
31. **T. Nowotny** Ratio Coding and Dynamic Range: Lessons from the Moth Pheromone System. Workshop on Bioinspired computation for chemical sensing, Barcelona, invited (2011)
32. **T. Nowotny.** Winnerless competition in a network of Hodgkin-Huxley neurons, "Living Non-linear Dynamics" birthday symposium for Mikhail I. Rabinovich, San Diego (2011)
33. **T. Nowotny.** Models of Insect Olfaction, Sheffield University (2011)

34. **T. Nowotny.** Dynamic Clamp with StdpC2010, University of Köln, Germany (2010)
35. **T. Nowotny.** Models of insect olfaction, INRA Versailles, Paris (2010)
36. **T. Nowotny.** Feasibility of biomimetic algorithms on modern highly parallel GPU hardware, University of California, Riverside (2009)
37. **T. Nowotny.** Feasibility of biomimetic algorithms on modern highly parallel GPU hardware, Bio-Circuits Institute, University of California San Diego (2009)
38. **T. Nowotny.** Models of information processing in the olfactory system of insects, Arizona State University, Tempe (2009)
39. **T. Nowotny.** Heteroclinic structures in circuits of Hodgkin-Huxley neurons: The origin of independent spiking and bursting in neural microcircuits? IUPUI Indianapolis (2009)
40. **T. Nowotny.** The olfactory system of insects suggests a random kernel method for classification, IBEC Seminar, Barcelona (2009)
41. **T. Nowotny.** Parallel implementation of large (neural) networks on NVidia<sup>®</sup> CUDA<sup>™</sup>, CRG Barcelona (2009)
42. **T. Nowotny.** Modelling Insect Olfaction, Universidad Autónoma de Madrid (2009)
43. **T. Nowotny.** Pattern classification in the olfactory system of insects, University of Hertfordshire (2009)
44. **T. Nowotny.** Heteroclinic structures in small motifs of Hodgkin-Huxley neurons? Indications from a numerical study, University of Exeter (2008)
45. **T. Nowotny.** Pattern recognition in the insect olfactory pathway, The Neurosciences Institute, La Jolla, California (2008)
46. **T. Nowotny.** Learning pattern classification from the olfactory system of insects, Alergic seminar series, University of Sussex (2008)
47. **T. Nowotny.** Learning pattern classification from the olfactory system of insects, University of Surrey (2008)
48. **T. Nowotny.** Synchronization mediated by Spike-Timing dependent Plasticity, Neuroscience seminar series, University of Sussex (2007)
49. **T. Nowotny.** Information processing in olfactory networks, University of Warwick (2007)
50. **T. Nowotny.** From olfactory networks to single cell entrainment: What algorithms determine neuronal network function? UCSD (2006)
51. **T. Nowotny.** From olfactory networks to single cell entrainment: What algorithms determine neuronal network function? University of Sussex (2006)
52. **T. Nowotny.** From olfactory networks to single cell entrainment: What algorithms determine neuronal network function? Shanghai (2006)
53. **T. Nowotny.** From olfactory networks to single cell entrainment: What algorithms determine neuronal network function? Technical University of Munich (2006)

54. **T. Nowotny.** From olfactory networks to single cell entrainment: What determines large scale network function? Ludwig-Maximilians University, Munich (2006)
55. **T. Nowotny.** The challenge of building accurate phenomenological neuron models for identified cells: Insights from models of the lobster LP cell, Bernstein Center for Computational Neuroscience, Munich (2005)
56. **T. Nowotny.** The challenge of building accurate phenomenological neuron models for identified cells: Insights from models of the lobster LP cell, Max Planck Institute for Mathematics in the Sciences, Leipzig (2005)
57. **T. Nowotny.** Self-organization in the olfactory system? Rapid odor recognition in insects, University of California, Riverside (2005)
58. **T. Nowotny.** Classification of odors in the olfactory system of insects, Freie Universität Berlin (2003)
59. **T. Nowotny.** Explaining synchronization in feedforward networks: Are McCulloch-Pitts neurons good enough? Technical University of Munich (2003)
60. **T. Nowotny.** Learning classification in the olfactory system of insects, Freie Universität Berlin (2003)
61. **T. Nowotny.** Sequence learning through STDP, “Chalk Talk”, Salk Institute, La Jolla (2003)
62. **T. Nowotny.** Enhanced synchronization through spike-timing dependent plasticity, University of Toronto (2003)
63. **T. Nowotny.** Decoding temporal information by means of slow excitation in the olfactory system of insects, Max Planck Institute for Neurobiology, Munich (2002)
64. **T. Nowotny.** Decoding temporal information by means of slow excitation in the olfactory system of insects, Technical University of Munich (2002)
65. **T. Nowotny.** Decoding temporal information by means of slow excitation in the olfactory system of insects, Freie Universität Berlin (2002)
66. **T. Nowotny.** Enhanced synchronization of biological and model neurons by spike-timing dependent plasticity, Georg-August Universität Göttingen (2002)
67. **T. Nowotny.** Decoding temporal information by means of slow excitation in the olfactory system of insects, Max Planck Institute for Mathematics in the Sciences, Leipzig (2002)
68. **T. Nowotny.** Spatial representation of temporal information through spike timing dependent plasticity, Universität Leipzig (2002)