Curriculum Vitae Prof. Dr. Lars Chittka

Image: Markus Scholz for the Leopoldina

Name: **Lars Chittka**

Born: **13 April 1963**

Research Priorities: Entomology, evolutionary biology, cognitive research, sensory ecology, behavioural ecology

Lars Chittka is a biologist who conducts research into the evolutionary ecology of sensory systems and cognition by using insect-plant interactions as a model. He is especially renowned for his discoveries concerning the intelligence of honeybees and bumblebees. Chittka's findings marked a departure from the prevailing view that insects were only capable of the most basic forms of associative learning. His work on the variation in cognitive skills between individual bees, colonies and bee populations has provided a new perspective on insect conservation.

Academic and Professional Career

2015	Guest Professor, Fujian Agriculture and Forestry University, Fuzhou City, China
since 2005	Professor of Sensory and Behavioural Ecology, School of Biological and Behavioural Sciences, Queen Mary University of London (QMUL), London, UK
2003 - 2005	Reader in Behavioural Ecology, QMUL, London, UK
2002 - 2003	Senior Lecturer, QMUL, London, UK
2000 - 2002	Senior Lecturer, University of Würzburg (JMU), Würzburg, Germany
1997 - 2000	Lecturer, JMU, Würzburg, Germany
1994 - 1997	Adjunct Assistant Professor, Stony Brook University, Stony Brook, USA
1994	Postdoctoral Fellow, Freie Universität Berlin, Berlin, Germany
1991 - 1993	PhD, Freie Universität Berlin, Berlin, Germany

1984 - 1991	Degree in Biology, University of Göttingen, Göttingen and Freie Universität Berlin, Berlin, Germany

Functions in Scientific Societies and Committees

2019	Chairperson, Board, National Scientific Program "Excellent Research and People for the Development of European Science" (VIHREN), Bulgarian Science Fund (BNSF)
2019	Member, Panel SyG3A, Synergy Grants, European Research Council (ERC)
2008 - 2012	Founder and Scientific Director, Research Centre for Psychology, QMUL, London, UK
2011, 2013	Chairperson, Panel LS8, Consolidator Grants, ERC
2010	Vice Chairperson, Panel LS8, Starting Grants, ERC
2007 - 2010	Member, Panel LS8, Starting Grants, ERC

Project Coordination, Membership in Collaborative Research Projects

2019 - 2024	Member, Project "Foundations of Animal Sentience – ASENT", ERC
2017 - 2021	Member, Program Grant "Brains on Board: Neuromorphic Control of Flying Robots", Engineering and Physical Sciences Research Council (EPSRC), Swindon, UK
2014 - 2019	Coordination, Project "SpaceRadarPollinator: Space use by bees – radar tracking of spatial movement patterns of key pollinators", ERC
2014 - 2018	Member, Grant "A neural circuit approach to cognition and its limits in microbrains", Human Frontier Science Program (HFSP)
2007 - 2010	Coordination, Cognitive Systems Foresight Project "Bees and the travelling salesman problem: how tiny brains solve complex cognitive tasks", Wellcome Trust, London, UK, Biotechnology and Biological Sciences Research Council (BBSRC), Swindon, UK and EPSRC, Swindon, UK
2006 - 2009	Coordination, Project "Quantifying the dynamics of predator avoidance learning: bumblebees as a model", Natural Environment Research Council (NERC), Swindon, UK
2004 - 2007	Coordination, Project "The evolution of learning – bumblebees as a model", NERC, Swindon, UK

Honours and Awarded Memberships

since 2023	Fellow, American Association for the Advancement of Science (AAAS)
since 2021	Member, German National Academy of Sciences Leopoldina, Germany

2017 - 2018	Fellowship, Wissenschaftskolleg zu Berlin – Institute for Advanced Study, Berlin, Germany
2017	Media Star Award, QMUL, London, UK
2014	Wolfson Research Merit Award, Royal Society, UK
since 2011	Member, Faculty Opinions (formerly: Faculty of 1000), London, UK
since 2009	Member, Royal Society of Biology (FRSB), UK
2006	Lesley Goodman Award, Royal Entomological Society, St Albans, UK
since 2004	Member, The Linnean Society of London (FLS), London, UK
since 2004	Member, Royal Entomological Society (FRES), St Albans, UK

Research Priorities

Lars Chittka is a biologist who conducts research into the evolutionary ecology of sensory systems and cognition by using insect-plant interactions as a model. He is especially renowned for his discoveries concerning the intelligence of honeybees and bumblebees. Chittka's findings marked a departure from the prevailing view that insects were only capable of the most basic forms of associative learning. His work on the variation in cognitive skills between individual bees, colonies and bee populations has provided a new perspective on insect conservation.

With his working group, Chittka has made fundamental contributions to our understanding of how the cognitive-behavioural processes in animals function in ecosystems. His working group discovered that insects can create detailed memories of the landscape surrounding their hives, can count and can learn from each other in order to work out how to use tools. These findings sparked a new trend of exploring which cognitive skills could be implemented in an insect's brain and how these skills could be realised on a neural level.

Using radar tracking, Chittka's team has demonstrated how pollinating insects can solve a simple version of the travelling salesman problem, a statistical mathematical model of combinatorial optimisation. Chittka's investigations on emotion-like states, social learning and speed-accuracy trade-offs in decision-making have enabled him to build neural models. These models show that sophisticated forms of information processing can develop from the same small neural circuit models that are used for "simple" classical conditioning. This has opened up the idea that many forms of cognition are "simple" on a computational level and can therefore evolve relatively easily.

In addition to neural principles, Chittka has conducted research into the variation in cognitive skills between individual bees, colonies and bee populations and has calculated the fitness benefits of learning ability in the wild. His discoveries have had far-reaching implications on our general understanding of animal cognition, its evolution and its neural bases and have

offered a new perspective on nature conservation.