

Curriculum vitae



10/4/2024

LARS CHITTKA, MSc, PhD, Dr habil, FLS, FRES, FRSB
Professor in Sensory and Behavioural Ecology

School of Biological and Behavioural Sciences
Queen Mary, University of London
Mile End Road
London E1 4NS

POSITIONS:

2005-present: Professor in Sensory & Behavioural Ecology, Queen Mary University of London
2008-2012: Scientific Director, Research Centre for Psychology, QMUL
2003-2005: Reader in Behavioural Ecology, Queen Mary University of London
2002-2003: Senior Lecturer, Queen Mary University of London
2000-2002: Senior Lecturer, Würzburg University
1997-2000: Lecturer, Würzburg University
1994-1997: Postdoctoral fellow, SUNY Stony Brook
1994 Postdoctoral fellow, FU Berlin

HONORARY POSITIONS, AWARDS AND OFFERS:

2024 – Founders’ Memorial Award, Entomological Society of America, USA
2024 – Distinguished Visitor in Organismal Biology Award, Cornell University, Ithaca, USA
2024 – Vice Principal’s Award for Research Excellence, Queen Mary University of London
2023 – Hilldale Award, University of Wisconsin, Madison, USA
2023 – Pineapple Science Award, Zhejiang Science and Technology Museum, Hangzhou, China
2022 – Election as a Fellow of the AAAS (American Association for the Advancement of Science)
2021 – Election as a member of the Leopoldina, the German National Academy of Sciences
2021 – Election to Sigma Xi, the Scientific Research Honor Society
2017-18 - Fellowship of Institute of Advanced Study (Wissenschaftskolleg) Berlin
2017 – *Media Star* Award, Queen Mary University of London
2017 – *Faculty Research Contribution Award*, Queen Mary University of London
2016 – Faculty member at Interdisciplinary College, Günne, Germany
2015 - Guest Professor, Fujian Agricultural and Forestry University, China
2015 - *Faculty Research Performance Award*, Queen Mary University of London
2014 - Royal Society Wolfson Research Merit Award
2013 - Offer of Full Professorship at Imperial College, London (declined)
2011 - present – Member, Faculty Opinions (formerly Faculty of 1000)
2006 - Lesley Goodman Award, Royal Entomological Society
2001 - Heisenberg Award, German Research Foundation (DFG)
1994-1997: Adjunct Assistant Professor, SUNY Stony Brook
1997 - Guest Professor, University of Oklahoma, Tulsa

EDUCATION:

2000 Habilitation in Biology, University of Würzburg

1993 Ph.D. (summa cum laude – 1st class) in Biology at the Free University in Berlin

1991 Diploma (M.S.) of Biology at the Free University of Berlin (1st class)

PUBLISHED SCIENTIFIC PAPERS, BOOKS AND PAPERS IN THE PRESS

(17 popular scientific articles and 12 book reviews further below)

2024

279. Bridges, A.D., Royka, A., Wilson, T., Lockwood, C., Richter, J., Juusola, M., **Chittka, L.** (2024) Bumblebees socially learn behaviour too complex to innovate alone. *Nature* 627: 572-578; <https://doi.org/10.1038/s41586-024-07126-4>

278. Gibbons, M., Pasquini, E., Kowalewska, A., Read, E. Gibson, S., Crump, A., Solvi, C., Versace, E., **Chittka, L.** (2024). Noxious stimulation induces self-protective behavior in bumblebees. *iScience*, in press

277. Romero González, J.E., Solvi, C., Peng, F., **Chittka, L.** (2024) Behaviour of honeybees integrated into bumblebee nests and the response of their hosts. *Apidologie*, in press

276. Zhou, D., Dong, S., Ge, J., Wang, C., **Chittka, L.**, Wen, C., Wen, J. (2024) Bumblebees attend to both the properties of the string and the target in string-pulling tasks, but prioritize the features of the string. *Insect Science*, <https://doi.org/10.1111/1744-7917.13373>

275. Zhou, Y., Ding, S., Liao, C., Wu., J., **Chittka, L.**, Solvi, C., Peng, C. (2024) Bumblebees' food preferences are jointly shaped by rapid valuation of nectar sugar concentration and viscosity. *Animal Behaviour* 210: 419-427

274. Zhou, Y., MaBouDi, H., Peng, C., Galpayage Dona, H.S., Gutierrez Al-Khudhairi, S., **Chittka, L.**, Solvi, C., Peng, F. (2024) Bumblebees display stimulus-specific persistence behaviour after being trained on delayed reinforcement. *Behavioural Ecology and Sociobiology* 78, <https://doi.org/10.1007/s00265-023-03414-7>

2023

273. Bridges, A., **Chittka, L.** (2023) Escaping anthropocentrism in the study of non-human culture. *Physics of Life Reviews*, <https://doi.org/10.1016/j.plrev.2023.01.008>

272. Bridges, A.D., MaBouDi, H., Procenko, O., Lockwood, C., Mohammed, Y., Kowalewska, A., Romero González, J.E., Woodgate, J., **Chittka, L.** (2023) Bumblebees acquire alternative puzzle-box solutions via social learning. *PLoS Biology*, 21(3): e3002019. <https://doi.org/10.1371/journal.pbio.3002019>

271. **Chittka, L.**, Rossi, N. (2023) Bees learn to dance. *Science*, 379: 985-986; DOI: 10.1126/science.adg7317

270. Crump, A., Gibbons, M., Barrett, M., Birch, J., **Chittka, L.** (2023) Is it time for insect researchers to consider their subjects' welfare? *PLoS Biology* 21(6): e3002138.
<https://doi.org/10.1371/journal.pbio.3002138>

269. Gallo, V., Bridges, A.D., Woodgate, J.L., **Chittka, L.** (2023) Sub-cell features govern the placement of new cells by honeybees during comb construction. *Journal of Comparative Physiology*, DOI: <https://doi.org/10.1007/s00359-023-01632-y>

268. Iturbe, X., Abella, J., Alcaide, S., Beyne, E., Charles, H.-P., **Chittka, L.**, Dávila, A., Dupret, Y., Erdmann, A., Fontanelli, A., Flich, J., Grosu, R., Carles Hernández, Hochmann, J., Ielmini, D., Isakovic, H., Isusquiza, E., Jackson, D., Kooli, M., Linares-Barranco, B., Laurent, E., Lindwer, M., Masařík, K., Mentens, N., Moreira, O., Noel, J.-P., Posch, C., Priller, P., Prikryl, Z., Rhodes, O., Stefanov, T., Taliercio, M., Ugarte, J., Van der Plas, G., Vianello, E. and Zaykov P. (2023) NimbleAI: Towards neuromorphic sensing - processing 3D-integrated chips. In Proceedings: 26th Int. Conf. Design, Automation and Test in Europe (DATE'23), Antwerp, Belgium, Apr. 17-19, 2023.

2022

267. **Chittka, L.** (2022) *The Mind of a Bee*. Princeton University Press, Princeton, USA

266. **Chittka, L.**, Rossi, N. (2022) Social cognition in insects. *Trends in Cognitive Sciences*, 26 (7): 578-592; <https://doi.org/10.1016/j.tics.2022.04.001>

265. Colgan, T.J., Arce, A.N., Gill, R.J., Ramos Rodrigues, A., Kanteh, A., Duncan, E.J., Li L., **Chittka, L.**, Wurm, Y. (2022) Genomic signatures of recent adaptation in a wild bumblebee. *Molecular Biology and Evolution*, 39(2), msab366, <https://doi.org/10.1093/molbev/msab366>

264. Galpayage Dona, H. S., Solvi, C., Kowalewska, A., Mäkelä, K., MaBouDi, H, **Chittka, L.**, (2022) Do bumble bees play? *Animal Behaviour*, 194: 239-251;
<https://doi.org/10.1016/j.anbehav.2022.08.013>

263. Gibbons, M., **Chittka, L.** (2022) A framework for evaluating evidence of pain in animals. *Animal Sentience*, DOI 10.51291/2377-7478.1767
<https://www.wellbeingintlstudiesrepository.org/cgi/viewcontent.cgi?article=1767&context=animsent>

262. Gibbons, M., Crump, A., Barrett, M., Sarlak, S., Birch, J., **Chittka, L.** (2022) Can insects feel pain? A review of the neural and behavioural evidence. *Advances in Insect Physiology*, 63: 155-229

261. Gibbons, M., Sarlak, S., **Chittka, L.** (2022) Descending control of nociception in insects? *Proceedings of the Royal Society London, Series B*, 20220599;
<https://doi.org/10.1098/rspb.2022.0599>

260. Gibbons, M., Versace, E., Crump, A. Baran, B., **Chittka, L.** (2022) Motivational trade-offs and modulation of nociception in bumblebees. *Proc Natl Acad Sci USA*, 119 No. 31 e2205821119 <https://doi.org/10.1073/pnas.2205821119>
259. Guiraud, M., Roper, M., Wolf, S., Woodgate, J.L, **Chittka, L.** (2022) Discrimination of edge orientation by bumblebees. *PLoS ONE*, 17(6): e0263198 <https://doi.org/10.1371/journal.pone.0263198>
258. Irwin, L.N., **Chittka, L.**, Jablonka, E., Mallatt, J., (2022) Editorial: Comparative Animal Consciousness. *Frontiers in Systems Neuroscience* . 16:998421. doi: 10.3389/fnsys.2022.998421
257. Solvi, C., Zhou, Y., Feng, Y., Lu, Y., Roper, M., Sun, L., Reid, R.J., **Chittka, L.**, Barron, A.B., Peng, F. (2022). Bumblebees retrieve only the ordinal ranking of foraging options when comparing memories obtained in distinct settings. *eLife* 11:e78525. <https://doi.org/10.7554/eLife.78525>

2021

256. Brebner, J., **Chittka, L.** (2021) Animal Cognition: The self-image of a bumblebee. *Current Biology*, 31, R207–R209. <https://doi.org/10.1016/j.cub.2020.12.027>
255. Brebner, J., Makinson, J., Bates, O., Rossi, N., Lim, K., Pasquaretta, C. Dubois, T., Gomez-Moracho, T., Lihoreau, M., **Chittka, L.**, Woodgate, J. (2021) Bumblebees strategically use ground-level linear features in navigation. *Animal Behaviour*, 179: 147-160 doi.org/10.1016/j.anbehav.2021.07.003
254. Gallo, V., **Chittka, L.** (2021) Stigmery versus behavioral flexibility and planning in honeybee comb construction. *Proc Natl Acad Sci USA*, 118 (33) e2111310118; <https://doi.org/10.1073/pnas.2111310118>
253. Li, L., Solvi, C., Zhang, F., Qi, Z., **Chittka, L.**, Zhao, W. (2021). Gut microbiome drives individual memory variation in bumblebees. *Nature Communications*, 12, 6588. <https://doi.org/10.1038/s41467-021-26833-4>
252. Nityananda, N., **Chittka, L.** (2021) Reward value is more important than physical saliency during bumblebee visual search for multiple rewarding targets. *Animal Cognition*, 24: 803-814/ DOI: 10.1007/s10071-021-01479-3
251. Woodgate, J.L., Makinson, J.C., Rossi, N., Lim, K.S., Reynolds, A.M., Rawlings, C.J., **Chittka, L.** (2021) Harmonic radar tracking reveals that honeybee drones navigate between multiple aerial leks. *iScience*, DOI: <https://doi.org/10.1016/j.isci.2021.102499>

2020

250. **Chittka, L.** (2020) The secret life of bees as horticulturists? *Science*, 368: 824-825. DOI: 10.1126/science.abc2451
249. Galpayage Dona, S.G., **Chittka, L.** (2020) Charles H. Turner, pioneer in animal cognition.

Science, 370: 530-531. DOI: 10.1126/science.abd8754

248. Loukola, O., Gatto, E., Híjar-Islas, A.C., **Chittka, L.** (2020). Selective interspecific information use in the nest choice of solitary bees. *Animal Biology* 70, Issue 1:1-11. DOI: <http://doi.org/10.1163/15707563-20191233>

247. MaBouDi, H., Galpayage, Dona, H.S., Gatto, E., Loukola, O.J., Buckley, E., Onoufriou, P.D., Skorupski, P., **Chittka, L.** (2020) Bumblebees use sequential scanning of countable items in visual patterns to solve numerosity tasks. *Integrative and Comparative Biology* 60: 929–942; <https://doi.org/10.1093/icb/icaa025>

246. MaBouDi, H., Solvi, C., **Chittka, L.** (2020) Bumblebees learn a relational rule but switch to a win-stay/lose-switch heuristic after extensive training. *Frontiers in Behavioral Neuroscience* 14(137): DOI: 10.3389/fnbeh.2020.00137

245. Romero Gonzalez, E.R., Solvi, C., **Chittka, L.** (2020) Honeybees adjust colour preferences in response to concurrent social information from conspecifics and heterospecifics. *Animal Behaviour*, 170: 219-228; <https://doi.org/10.1016/j.anbehav.2020.10.008>

244. Solvi, C., Gutierrez Al-Khudhairi, S. & **Chittka, L.** (2020) Bumblebees display cross-modal object recognition between visual and tactile senses. *Science*, 367, 910-912. DOI: <http://doi.org/10.1126/science.aay8064>

2019

243. Arnold, S.E.J. & **Chittka, L.** (2019) Flower colour diversity seen through the eyes of pollinators. A commentary on ‘Floral colour structure in two Australian herbaceous communities: it depends on who is looking’ *Annals of Botany*, 124(2): viii-ix. DOI:<http://doi.org/10.1093/aob/mcz107>

242. Bayne, T., Brainard, D., Byrne, R.W., **Chittka, L.**, Clayton, N., Heyes, C., Mather, J., Ölveczky, B., Shadlen, M., Suddendorf, T., Webb, B. (2019) What is cognition? *Current Biology*, 29(13): R608-R615. DOI: <https://doi.org/10.1016/j.cub.2019.05.044>

241. **Chittka, L.**, Giurfa, M., Riffell, J. (2019) Editorial: The Mechanisms of Insect Cognition. *Frontiers in Psychology*, doi: 10.3389/fpsyg.2019.02751

240. **Chittka, L.** & Wilson, C. (2019) Expanding consciousness. *American Scientist*, 107: 364-369. DOI: <https://doi.org/10.1511/2019.107.6.364>

239. Bridges, A., **Chittka, L.** (2019) Conformity and the beginnings of culture in an insect. *Current Biology*, 29: R150–R172

238. Colgan, T.J., Fletcher, I.K., Arce, A.N., Gill, R.J., Ramos Rodrigues, A., Stolle, E., **Chittka, L.**, Wurm, Y. (2019) Caste- and pesticide-specific effects of neonicotinoid pesticide exposure on gene expression in bumblebees. *Molecular Ecology*: 28:1964–1974 DOI: <https://doi.org/10.1111/mec.15047>

237. Guan, C., Egertová, M., Perry, C.J., **Chittka, L.**, Chittka, A. (2019) Temporal correlation of elevated PRMT1 gene expression with mushroom body neurogenesis during bumblebee brain development. *Journal of Insect Physiology*, 116: 57-69; <https://doi.org/10.1016/j.jinsphys.2019.04.011>
236. Makinson, J.C., Woodgate, J.L., Reynolds, A., Capaldi, E.A., Perry, C.J., **Chittka, L.** (2019) Harmonic radar tracking reveals random dispersal pattern of bumblebee (*Bombus terrestris*) queens after hibernation. *Scientific Reports*, 9:4651. DOI: <https://doi.org/10.1038/s41598-019-40355-6>
235. Pasquaretta, C., Jeanson, R., Pansanel, J., Raine, N.E., **Chittka, L.**, Lihoreau, M. (2019) A spatial network analysis of resource partitioning between bumblebees foraging on artificial flowers in a flight cage. *Movement Ecology*, 7:4; <https://doi.org/10.1186/s40462-019-0150-z>
234. Perry, C.J., **Chittka, L.** (2019) How foresight might support the behavioral flexibility of arthropods. *Current Opinion in Neurobiology*, 54: 171-177. DOI: <https://doi.org/10.1016/j.conb.2018.10.014>
233. Vasas, V., **Chittka, L.** (2019) Insect-inspired sequential inspection strategy enables an artificial network of four neurons to estimate numerosity. *iScience*, 11: 85-92. DOI: <https://doi.org/10.1016/j.isci.2018.12.009>
232. Vasas, V., Peng, F., MaBouDi, H., **Chittka, L.** (2019) Randomly weighted receptor inputs can explain the large diversity of colour-coding neurons in the bee visual system. *Scientific Reports*, 9: 8330; DOI: 10.1038/s41598-019-44375-0

2018

231. Avarguès-Weber, A., Lachlan, R., **Chittka, L.** (2018). Bumble bee social learning can lead to suboptimal foraging choices. *Animal Behaviour*, 135: 209-214
230. Emberton, S., **Chittka, L.**, Cavallaro, A. (2018) Underwater image and video dehazing with pure haze region segmentation. *Computer Vision and Image Understanding*, 168: 145-156; <https://doi.org/10.1016/j.cviu.2017.08.003>
229. Gallo V. & **Chittka L.** (2018) Cognitive aspects of comb-building in the honeybee? *Frontiers in Psychology*, 9:900. DOI: 10.3389/fpsyg.2018.00900.
228. Guiraud M., Roper M. & **Chittka L.** (2018) High-speed videography reveals how honeybees can turn a spatial concept learning task into a simple discrimination task by stereotyped flight movements and sequential inspection of pattern elements. *Frontiers in Psychology*, 9:1347. DOI: 10.3389/fpsyg.2018.01347.
227. Lawson D.A., **Chittka L.**, Whitney H.M. & Rands S.A. (2018) Bumblebees distinguish floral scent patterns, and can transfer these to corresponding visual patterns. *Proceedings of the Royal Society of London B: Biological Sciences*, 285(1880): 20180661:. DOI: 10.1098/rspb.2018.0661.

226. Li, L., Su, S., Perry, C.J., Elphick, M., **Chittka, L.**, Søvik, E. (2018) Large-scale transcriptome changes in the process of long-term visual memory formation in the bumblebee *Bombus terrestris*. *Scientific Reports* 8:534; DOI:10.1038/s41598-017-18836-3
225. Matthews, T., Osorio, D.C., Cavallaro, A., **Chittka, L.** (2018) The importance of spatial visual scene parameters in predicting optimal cone sensitivities in routinely trichromatic frugivorous old-world primates. *Frontiers in Neuroscience*, 12:15. doi: 10.3389/fncom.2018.00015
224. Nieberding C, van Dyck H, **Chittka, L.** (2018) Adaptive learning in non-social insects: from theory to field work, and back. *Current Opinion in Insect Science*, 27: 75–81; <https://doi.org/10.1016/j.cois.2018.03.008>
223. Skorupski, P., MaBouDi, H., Galpayage Dona, S., **Chittka, L.** (2018) Counting Insects. *Philosophical Transactions of the Royal Society B*, 373: 20160513; DOI: 10.1098/rstb.2016.0513
222. Vasas, V., Brebner, J., **Chittka, L.** (2018) Colour discrimination is not just limited by photoreceptor noise: a comment on Olsson et al. *Behavioral Ecology*, 29(2): 285–286. DOI: <https://doi.org/10.1093/beheco/arx157>
221. Wang, M.Y., **Chittka, L.**, Ings, T.C. (2018) Bumblebees express consistent, but flexible, speed accuracy tactics under different levels of predation threat. *Frontiers in Psychology*, doi: 10.3389/fpsyg.2018.01601
220. Woodgate, J., **Chittka, L.** (2018) Central place foraging. In: Encyclopedia of Animal Cognition and Behavior; edited by Jennifer Vonk and Todd K. Shackelford, DOI: 10.1007/978-3-319-47829-6_881-1

2017

219. Baracchi D., Marples A., Jenkins A.J., Leitch A.R., **Chittka L.** (2017) Nicotine in floral nectar pharmacologically influences bumblebee learning of floral features. *Scientific Reports*, 7: 1951; DOI: 10.1038/s41598-017-01980-1
218. Buatois, A., Pichot, C., Schultheiss, P., Sandoz, J.C., Lazzari, C.R., **Chittka, L.**, Avarguès-Weber, A., Giurfa, M. (2017) Associative visual learning by tethered bees in a controlled visual environment. *Scientific Reports*, 7: 12903; DOI:10.1038/s41598-017-12631-w
217. **Chittka, L.** (2017) Bee cognition. *Current Biology*, 27(19): R1049-R1053
216. **Chittka, L.**, Skorupski, P. (2017). Active vision: A broader comparative perspective is needed. *Constructivist Foundations* 13(1): 512-513
216. Emberton, S., **Chittka, L.**, Cavallaro, A. (2017) Underwater image and video dehazing with pure haze region segmentation. *Computer Vision and Image Understanding*, <https://doi.org/10.1016/j.cviu.2017.08.003>

215. Li, L., MaBouDi, H., Egertova, M., Elphick, M.R., **Chittka, L.**, Perry, C.J. (2017) A possible structural correlate of learning performance on a colour discrimination task in the brain of the bumblebee. *Proc Roy Soc Lond B*, 20171323; <http://dx.doi.org/10.1098/rspb.2017.1323>
214. Loukola, O., Perry, C.J., Coscos, L., **Chittka, L.** (2017) Bumblebees show cognitive flexibility by improving upon an observed complex behaviour. *Science*, 355: 833–836
213. MaBouDi, H., Shimazaki, H., Giurfa, M., **Chittka, L.** (2017) Olfactory learning without the mushroom bodies: spiking neural network models of the honeybee lateral antennal lobe tract reveal its capacities in odour memory tasks of varied complexities. *PLoS Computational Biology*, 13(6): e1005551. <https://doi.org/10.1371/journal.pcbi.1005551>
212. Pasquaretta, C., Jeanson, R., Andalo, C., **Chittka, L.**, Lihoreau, M. (2017) Analysing plant-pollinator interactions with spatial movement networks. *Ecological Entomology*, 42(S1): 4–17
211. Peng, F. & **Chittka, L.** (2017) A simple computational model of the bee mushroom body can explain seemingly complex forms of olfactory learning and memory. *Current Biology*, 27: 224-230
210. Perry, C.J., Barron, A., **Chittka, L.** (2017) The frontiers of insect cognition. *Current Opinion in Behavioral Sciences*, 16:111-118
209. Roper, M., Fernando, C., **Chittka, L.** (2017) Insect bio-inspired neural network provides new evidence on how simple feature detectors can enable complex visual generalization and stimulus location invariance in the miniature brain of honeybees. *PLoS Computational Biology*, 13(2): e1005333. doi:10.1371/journal.pcbi.1005333
208. Vasas, V., Hanley, D., Kevan, P.G., **Chittka, L.** (2017) Multispectral images of flowers reveal the adaptive significance of using green receptors for edge detection in bees. *Journal of Comparative Physiology* 203: 301-311
207. Wang, M.-Y., Vasas, V., **Chittka, L.**, Yen, S.H. (2017) Sheep in wolf's clothing: multicomponent traits enhance the success of mimicry in spider-mimicking moths (Lepidoptera, Choreutidae). *Animal Behaviour*, 127:219-224; doi:10.1016/j.anbehav.2017.03.020
206. Woodgate, J., Makinson, J., Lim, K.S., Reynolds, A.M., **Chittka, L.** (2017) Continuous radar tracking illustrates the development of multi-destination routes of bumblebees. *Scientific Reports*, 7: Article number: 17323, doi:10.1038/s41598-017-17553-1

2016

205. Alem, S., Perry, C.J., Zhu, X., Loukola, O.J., Ingraham, T. Søvik, E., **Chittka, L.** (2016) Associative mechanisms allow for social learning and cultural transmission of string pulling in an insect. *PLoS Biology*, 14(10): e1002564. doi:10.1371/journal.pbio.1002564

204. Baracchi, D., Turillazzi, S., **Chittka, L.** (2016) Facial patterns in a tropical social wasp correlate with colony membership. *The Science of Nature (Naturwissenschaften)* 103: 80. doi:10.1007/s00114-016-1406-8
203. **Chittka, L.** (2016) Molecular and neural mechanisms underpinning adaptive behaviour in insects. *Current Opinion in Insect Science*, 15: vii-ix
202. Dawson, E.H., **Chittka, L.**, Leadbeater, E. (2016) Alarm substances induce associative social learning in honeybees, *Apis mellifera*. *Animal Behaviour*, 122:17-22
201. Emberton, S., **Chittka, L.**, Cavallaro, A., Wang, M. (2016) Sensor Capability and Atmospheric Correction in Ocean Colour Remote Sensing. *Remote Sensing*, 8(1), doi:10.3390/rs8010001
200. Lihoreau, M., **Chittka, L.**, Raine, N. (2016) Monitoring flower visitation networks and interactions between pairs of bumble bees in a large outdoor flight cage. *PLoS ONE*, 11(3), e0150844. DOI: 10.1371/journal.pone.0150844.
199. Lihoreau M., Ings T. C., **Chittka L.**, & Reynolds A. M. (2016). Signatures of a globally optimal searching strategy in the three-dimensional foraging flights of bumblebees. *Scientific Reports* 6: 30401. DOI:10.1038/srep30401
198. Niven, J. & **Chittka, L.** (2016) Evolving understanding of nervous system evolution. *Current Biology*, 26: R937-R940.
197. Solvi, C., Baciadonna, L. **Chittka, L.** (2016) Unexpected rewards induce dopamine-dependent positive emotion-like state changes in bumblebees. *Science*, 353: 1529-1531
196. Smolla, M., Alem, S., **Chittka, L.**, Shultz, S. (2016) Copy-when-uncertain: bumblebees rely on social information when rewards are highly variable. *Biology Letters* 12: 20160188; DOI: 10.1098/rsbl.2016.0188
195. Whitney, H.M., Reed, A., Rands, S.A., **Chittka, L.**, Glover, B.J. (2016) Flower iridescence increases object detection in the insect visual system without compromising object identity. *Current Biology*, 26: 802-808.
194. Wolf, S., **Chittka, L.** (2016) Male bumblebees (*Bombus terrestris*) perform equally well as workers in a serial colour learning task. *Animal Behaviour*, 111: 147-155
193. Woodgate J. L., Makinson J. C., Lim K. S., Reynolds A. M. & **Chittka L.** (2016) Life-Long Radar Tracking of Bumblebees. *PLoS ONE* 11(8): e0160333. DOI:10.1371/journal.pone.0160333

2015

192. Baracchi, D., Brown, M.J.F, **Chittka, L.** (2015) Behavioural evidence for self-medication in bumblebees? *F1000Research*, 4:73 (doi: 10.12688/f1000research.6262.2)

191. Baracchi, D, Petrocelli, I., **Chittka, L.**, Ricciardi, G., Turillazzi, S. (2015) Speed and accuracy in nestmate recognition: a hover wasp prioritises face recognition over colony odour cues to minimise intrusion by outsiders. *Proceedings of the Royal Society B*, 282: 20142750
190. Emberton, S., **Chittka, L.**, Cavallaro, A. (2015) Hierarchical rank-based veiling light estimation for underwater dehazing. In: Xie, X., Jones, M.W., Tam, G.K.L. (editors). *Proceedings of the British Machine Vision Conference (BMVC)*, pages 125.1-125.12. BMVA Press, DOI: 10.5244/C.29.125; <https://dx.doi.org/10.5244/C.29.125>
189. Hunt, K. & **Chittka, L.** (2015) Merging of long-term memories in an insect. *Current Biology*, 25: 741-745
188. Jones, P. Ryan, M.J. **Chittka, L.** (2015) The influence of past experience with flower reward quality on social learning in bumblebees. *Animal Behaviour*, 101: 11-18
187. McCarthy, E.W., Arnold, S.E.J., **Chittka, L.**, Le Comber, S.C., Verity, R., Dodsworth, S., Knapp, S. Kelly, L.J., Chase, MW, Baldwin, I.T., Kovařík, A., Mhiri, C., Taylor, L., Leitch, A.R. (2015) The effect of polyploidy and hybridisation on the evolution of floral colour in *Nicotiana* (Solanaceae). *Annals of Botany*, 115: 1117-1131
186. Morawetz, L., **Chittka, L.** & Spaethe, J. (2015) Honeybees (*Apis mellifera*) exhibit flexible visual search strategies for vertical targets presented at various heights. *F1000Research*, 3:174 (doi: 10.12688/f1000research.4799.2)
185. Nityananda, V., **Chittka, L.** (2015) Modality-specific attention in foraging bumblebees. *Royal Society Open Science*, DOI: 10.1098/rsos.150324
184. Sadd, BM & 143 other authors including **Chittka, L.** in position 130 (2015) The genomes of two key bumblebee species with primitive eusocial organisation. *Genome Biology* 16:76.
183. Wang, M.-Y., Brennan, C.H., Lachlan, R., **Chittka, L.** (2015) Speed-accuracy tradeoffs and individually consistent decision making by individuals and dyads of zebrafish in a colour discrimination task. *Animal Behaviour*, 103: 277-283.
182. Wolf, S., Roper, M., **Chittka, L.** (2015) Bumblebees utilize floral cues differently on vertically and horizontally arranged flowers. *Behavioural Ecology*, 26: 773-781

2014

181. Avarguès-Weber, A., **Chittka, L.** (2014) Local enhancement or stimulus enhancement? Bumblebee social learning results in a specific pattern of flower preference. *Animal Behaviour* 97: 185-191
180. Avarguès-Weber, A., **Chittka, L.** (2014) Observational conditioning in flower choice copying by bumblebees (*Bombus terrestris*): Influence of observer distance and demonstrator movement. *PLoS ONE*, 9(2): e88415. doi:10.1371/journal.pone.0088415

179. **Chittka, L.**, Faruq, S., Skorupski, P., Werner, A. (2014) Colour constancy in bees. *Journal of Comparative Physiology A*, 200: 435–448
178. **Chittka, L.** & Raine, N.E. (2014) Bumblebee colour patterns and predation risk: a reply to Owen. *Journal of Zoology*, 292: 133–135
177. Dawson, E. & **Chittka, L.** (2014) Bees use social information as an indicator of safety in dangerous environments. *Proceedings of the Royal Society B*, 281 no. 1785 20133174
176. Hunt, K. & **Chittka, L.** (2014) False memory susceptibility is correlated with categorisation ability in humans. *F1000 Research*, 3:154 (doi: 10.12688/f1000research.4645.1)
175. Nityananda, V., Skorupski, P., **Chittka, L.** (2014) Can bees see at a glance? *Journal of Experimental Biology*, 217: 1933-1939 (with *Dispatch* in *Current Biology*)

2013

174. Avarguès-Weber, A., Dawson, E.H., **Chittka, L.** (2013) Mechanisms of social learning across species boundaries. *Journal of Zoology*, 290: 2-11
173. Clare, E.L., Schiestl, F., Leitch, A.R., **Chittka, L.** (2013) The promise of genomics in the study of plant-pollinator interactions. *Genome Biology*, 14:207
172. **Chittka, L.**, Peng, F. (2013) Caffeine boosts bees' memories. *Science*, 339: 1157-1159.
171. **Chittka, L.**, Stelzer, R.J., Stanewsky R. (2013) Daily changes in UV light levels can synchronize the circadian clock of bumblebees (*Bombus terrestris*). *Chronobiology International*, 30: 434–442
170. Collett, M, **Chittka, L.**, Collett, T.S. (2013) Spatial memory in insect navigation. *Current Biology*, 23: R789-R800
169. Dawson, E., Avarguès-Weber, A., **Chittka, L.**, Leadbeater E. (2013) Learning by observation emerges from simple associations in an insect model. *Current Biology*, 23: 727-730
168. Faruq, S., McOwan, P., **Chittka, L.** (2013) The biological significance of colour constancy: an agent based model with bees foraging from flowers under varied illumination. *Journal of Vision*, 13(10):10, 1–14
167. Land, M., **Chittka, L.** (2013) Vision. In: *The Insects: Structure and Function*, 5th Edition (eds. Simpson, S. J. and Douglas, A. E.). Cambridge: Cambridge University Press, pp. 708-737.
166. Lihoreau, M., Raine, N.E., Reynolds, A.M. Stelzer, R.J., Lim, K.S. Smith, A.D., Osborne, J.L., **Chittka, L.** (2013) Unravelling the mechanisms of trapline foraging in bees. *Communicative and Integrative Biology*, 6:1, e22701
165. Papadopulos, A.S.T, Powell, MP, Pupulin, F., Warner, J., Hawkins, J.A. Salamin, N., **Chittka, L.**, Williams, N.H., Whitten, W.M., Loader, D., Valente, L.M., Chase, M.W.,

Savolainen, V. (2013) Convergent evolution of floral signals underlies the success of Neotropical orchids. *Proc R Soc Lond B*, 280: 20130960; <http://dx.doi.org/10.1098/rspb.2013.0960>

164. Reynolds, A.M., Lihoreau, M., **Chittka, L.** (2013) A simple iterative model accurately captures complex trapline formation by bumblebees across spatial scales and flower arrangements. *PLoS Computational Biology*, 9(3): e1002938. doi:10.1371/journal.pcbi.1002938

163. van der Woude, E., Smid, H.M., **Chittka, L.**, Huigens, M.E. (2013) Breaking Haller's rule: Brain-body size isometry in a minute parasitic wasp. *Brain, Behavior & Evolution* 81:86–92

162. Vukusic, P., **Chittka, L.** (2013). Visual signals: color and light production. In: *The Insects: Structure and Function*, 5th Edition (eds. Simpson, S. J. and Douglas, A. E.). Cambridge: Cambridge University Press (pp. 793-823)

161. Wang, M.Y., Ings, T.C., Proulx, M.J., **Chittka, L.** (2013) Can bees simultaneously engage in adaptive foraging behaviour and attend to cryptic predators? *Animal Behaviour*, 86: 859-866.

2012

160. Arnold, S.E.J., **Chittka, L.** (2012) Illumination preference, illumination constancy and colour discrimination by bumblebees in an environment with patchy light. *Journal of Experimental Biology*, 215, 2173-2180

159. **Chittka, L.**, Rossiter, S.J., Skorupski, P., Fernando, C. (2012) What is comparable in comparative cognition? *Philosophical Transactions of the Royal Society B*, 367, 2677-2685

158. Chittka, A., Wurm, Y., **Chittka, L.** (2012) Epigenetics: the making of ant castes. *Current Biology*, 22, R835-838

157. **Chittka, L.**, Dyer, A.G. (2012) Cognition: Your face looks familiar. *Nature (News & Views)*, 481,154–155

156. Dawson, E., **Chittka, L.** (2012) Conspecific and heterospecific information use in bumblebees. *PLoS ONE*, 7(2): e31444. doi:10.1371/journal.pone.0031444

155. Ings, T.C., Yang M.-Y., **Chittka, L.** (2012) Colour-independent shape recognition of cryptic predators by bumblebees. *Behavioural Ecology and Sociobiology*, 66: 487–496

154. Lenz, F., Ings, T.C., **Chittka, L.**, Chechkin, A.V., Klages, R. (2012) Spatio-temporal dynamics of bumblebees foraging under predation risk. *Physical Review Letters*, 108: DOI: 10.1103/PhysRevLett.108.098103

153. Lihoreau, M., **Chittka, L.**, Le Comber, S., Raine, N.E. (2012) Bees do not use nearest-neighbour rules for optimization of multi-location routes. *Biology Letters*, 8: 13-16.

152. Lihoreau, M., Latty, T., **Chittka, L.** (2012) An exploration of the social brain hypothesis in insects. *Frontiers in Physiology*, 3:442. doi: 10.3389/fphys.2012.00442

151. Lihoreau, M., Raine, N.E., Reynolds, A.M. Stelzer, R.J., Lim, K.S. Smith, A.D., Osborne, J.L., **Chittka, L.** (2012) Radar Tracking and Motion-sensitive Cameras on Flowers Reveal the Development of Pollinator Multi-Destination Routes over Large Spatial Scales. *PLoS Biology*, 10(9): e1001392. doi:10.1371/journal.pbio.1001392

150. Muller, H. & **Chittka, L.** (2012) Consistent interindividual differences in discrimination performance by bumblebees (Hymenoptera: Apidae: *Bombus terrestris*) in colour, shape and odour learning tasks. *Entomologia generalis*, 34: 1-8

149. Przybyłowicz, T., Roessingh, P., Biesmeijer, K., Oostermeijer, G., **Chittka, L.** and Gravendeel, B. (2012) The role of scent in chemical mimicry of the European lady's slipper orchid (*Cypripedium calceolus*). *Contributions to Zoology*, 81: 103-110

148. Raine, N.R. & **Chittka, L.** (2012) No Trade-Off between Learning Speed and Associative Flexibility in Bumblebees: A Reversal Learning Test with Multiple Colonies. *PLoS ONE*, 7(9): e45096. doi:10.1371/journal.pone.0045096

2011

147. **Chittka, L.** & Jensen, K. (2011) Animal cognition: concepts from apes to bees. *Current Biology*, 21: R116-119.

146. **Chittka, L.** & Skorupski, P. (2011) Information processing in miniature brains. *Proc Royal Soc Lond B*, 278: 885-888

145. Doering, T., **Chittka, L.** (2011) How human are insects, and does it matter? *Formosan Entomologist*, 31: 85-99

144. Leadbeater, E, **Chittka, L.** (2011) Do inexperienced bumblebee foragers use scent marks as social information? *Animal Cognition*, 14:915–919

143. Lihoreau, M., **Chittka, L.**, Raine, N.E. (2011) Trade-off between travel distance and prioritization of high-reward sites in traplining bumblebees. *Functional Ecology*, 25, 1284–1292

142. Mendl, M., Paul, E.S., **Chittka, L.** (2011) Animal Behaviour: Emotion in Invertebrates? *Current Biology*, 21: R463-465

141. Skorupski, P. & **Chittka, L.** (2011) Is colour cognitive? *Optics and Laser Technology*, 43: 251-260

140. Skorupski, P. & **Chittka, L.** (2011) Photoreceptor processing speed and changes in input resistance during light adaptation correlate with spectral class in bumblebee, *Bombus impatiens*. *PLoS One*, 6(10): e25989. doi:10.1371/journal.pone.0025989

139. Whitney, H.M., Bennett, K.M.V., Dorling, M., Sandbach, L., Prince, D., **Chittka, L.**, Glover, B.J. (2011) Why do so many petals have conical epidermal cells? *Annals of Botany*, 108: 609–616

138. Whitney, H.M., Poetes, R., Steiner, U., **Chittka, L.**, Glover, B.J. (2011) Determining the contribution of epidermal cell shape to petal wettability using isogenic *Antirrhinum* lines. *PLoS ONE*, 6: e17576. doi:10.1371/journal.pone.0017576

2010

137. Arnold, S.E.J, Faruq, S., Savolainen, V., McOwan, P.W., **Chittka, L.** (2010) FReD: The Floral Reflectance Database - a web portal for analyses of flower colour. *PLoS ONE* 5(12): e14287. doi:10.1371/journal.pone.0014287

136. Chittka, A. & **Chittka, L.** (2010) Epigenetics of royalty. *PLoS Biology*, 8(11): e1000532. doi:10.1371/journal.pbio.1000532

135. **Chittka, L.** (2010) Lars Chittka. *Current Biology*, 20: R1006-R1008

134. Ings, T.C., Ings, N., **Chittka, L.**, Rasmont, P. (2010) A failed invasion? Commercially introduced pollinators in Southern France. *Apidologie* 41: 1-13

133. Kapustjansky, A., **Chittka, L.**, Spaethe, J. (2010) Bees use three-dimensional information to improve target detection. *Naturwissenschaften*, 97: 229-233

132. Lihoreau M., **Chittka, L.**, Raine, N.R. (2010). Travel Optimization by Foraging Bumblebees through readjustments of traplines after discovery of new feeding locations. *American Naturalist*, 176: 744-757

131. Muller H., Grossmann, H., **Chittka, L.** (2010). "Personality" in bumblebees: individual consistency in responses to novel colours? *Animal Behaviour*, 80: 1065-1074

130. Niven, J. & **Chittka, L.** (2010) Reuse of identified neurons in multiple neural circuits. *Behavioral & Brain Sciences*, 33: 285-285

129. Skorupski, P. & **Chittka, L.** (2010) Differences in photoreceptor processing speed for chromatic and achromatic vision in the bumblebee, *Bombus terrestris*. *Journal of Neuroscience*, 30:3896 –3903

128. Skorupski, P. & **Chittka, L.** (2010) Photoreceptor spectral sensitivity in the bumblebee, *Bombus impatiens* (Hymenoptera: Apidae). *PLoS One*, 5(8): e12049. doi:10.1371/journal.pone.0012049

127. Stelzer, R.J., **Chittka, L.** (2010) Bumblebee foraging rhythms under the midnight sun, measured with radio-frequency identification. *BMC Biology*, 8:93 doi:10.1186/1741-7007-8-93

126. Stelzer, R.J., **Chittka, L.**, Carlton, M., Ings, T.C. (2010) *Winter active bumblebees achieve high foraging rates in urban Britain*. *PLoS One*, 5(3): e9559. doi:10.1371/journal.pone.0009559

125. Stelzer, R.J., Raine, N.E., Schmitt, K.D., **Chittka, L.** (2010) Effects of aposematic colouration on predation risk in bumblebees? A comparison between differently coloured populations, with consideration of the ultraviolet. *Journal of Zoology*, 282: 75-83

124. Stelzer, R.J. Stanewsky, R., **Chittka, L.** (2010) Circadian Rhythms of Complete Forager Castes of Bumblebee Colonies Monitored by Radio-Frequency Identification. *Journal of Biological Rhythms*, 25: 257-267

2009

123. Arnold, S.E.J., Le Comber, S., **Chittka, L.** (2009) Flower colour phenology in European grassland and woodland habitats, through the eyes of pollinators. *Israel Journal of Plant Sciences*, 57: 211-230

122. Arnold, S.E.J., Savolainen, V., **Chittka, L.** (2009) Flower colours along an alpine altitude gradient, seen through the eyes of fly and bee pollinators. *Arthropod-Plant Interactions*, 3: 27-43

121. **Chittka, L.**, Muller, H. (2009) Learning, specialization, efficiency and task allocation in social insects. *Communicative and Integrative Biology* 2: 151-154

120. **Chittka, L.**, Niven, J.E. (2009) Are bigger brains better? *Current Biology*, 19: R995–R1008

119. **Chittka, L.**, Skorupski, P., Raine, N.E., (2009) Speed-accuracy tradeoffs in animal decision making. *Trends in Ecology and Evolution*, 24: 400-407

118. Dangles, O., Irschick, D., **Chittka, L.** & Casas, J. (2009) Variability in sensory ecology: expanding the bridge between physiology and evolutionary biology. *Quarterly Review of Biology*, 84: 51-74

117. Ings, T.C., **Chittka, L.** (2009) Predator crypsis enhances behaviourally-mediated indirect effects on plants by altering bumblebee foraging preferences. *Proc. Royal Soc. B*, 276: 2031-2036

116. Ings, T.C., Raine, N.E., **Chittka, L.** (2009) A population comparison of the strength and persistence of innate colour preference and learning speed in the bumblebee *Bombus terrestris*. *Behavioural Ecology & Sociobiology*, 63: 1207-1218.

115. Leadbeater, E.A., **Chittka, L.** (2009) Bumblebees learn the value of social information through experience. *Biology Letters* 5: 310-312

114. Leadbeater, E.A. & **Chittka, L.** (2009) Social information use in foraging insects. In: S. Jarau & M. Hrncir (eds.) *Food Exploitation by Social Insects: Ecological, Behavioral, and Theoretical Approaches*. CRC Press, pp 135-146.

113. Molet, M., **Chittka, L.** & Raine, N.E. (2009) Learning of floral odour inside the nest by bumblebee (*Bombus terrestris*) workers during recruitment. *Naturwissenschaften*, 96: 213-219.

112. Molet, M., **Chittka, L.** & Raine, N.E. (2009) Potential application of the bumblebee foraging recruitment pheromone for commercial greenhouse pollination. *Apidologie*, 40: 608-116.

111. Ollerton, J., Cranmer, L., Stelzer, R., Sullivan, S., & **Chittka, L.** (2009) Bird pollination of Canary Island endemic plants. *Naturwissenschaften*, 96: 221-232.

110. Raine, N.E. & **Chittka, L.** (2009) Measuring the adaptiveness of social insect foraging strategies - an empirical approach. In: S. Jarau & M. Hrncir (eds.) *Food Exploitation by Social Insects: Ecological, Behavioral, and Theoretical Approaches*. CRC Press, pp 9-28

109. Whitney, H.M., **Chittka, L.**, Bruce, T.J.A, Glover, B. (2009) Conical cells allow bees to grip flowers and increase foraging efficiency. *Current Biology*, 19: 948-953.

108. Whitney, H.M., Kolle, M., Andrew, P., **Chittka, L.**, Steiner, U., Glover, B. (2009) Response to comment on "Floral iridescence, produced by diffractive optics, acts as a cue for animal pollinators" *Science*, 325, 1072-e; DOI: 10.1126/science.1173503

107. Whitney, H.M., Kolle, M., Andrew, P., **Chittka, L.**, Steiner, U., Glover, B. (2009) Floral iridescence, produced by diffractive optics, acts as a cue for animal pollinators. *Science*, 332: 130-133.

2008

106. Ings, T.C. & **Chittka, L.** (2008) Speed-accuracy tradeoffs and false alarms in bee responses to cryptic predators. *Current Biology* 18: 1520-1524.

105. Leadbeater, E.A. & **Chittka, L.** (2008) Social transmission of nectar-robbing behaviour in bumblebees. *Proc Roy Soc Lond B*, 275: 1669-1674

104. Molet, M., **Chittka, L.** Stelzer, R., Streit, S., Raine, N. (2008) Colony nutritional status modulates worker responses to foraging recruitment pheromone in the bumblebee *Bombus terrestris*. *Behavioural Ecology and Sociobiology*, 62: 1919-1926.

103. Muller H & **Chittka, L.**, (2008) Animal personalities: the advantage of diversity. *Current Biology* 18: R961-963.

102. Raine, N.E. & **Chittka, L.** (2008) The correlation of learning speed and natural foraging success in bumblebees. *Proc Roy Soc Lond B* 275: 803-808

101. Whitney, H.M., Dyer, A.G., **Chittka, L.**, Rands, S.A., Glover, B. (2008) The interaction of temperature and sucrose concentration on foraging preferences in bumblebees. *Naturwissenschaften*, 95: 845-850

2007

100. **Chittka, L.** & Doering, T. (2007) Are autumn leaf colours red signals to aphids? *PLoS Biology*, 5: 1640-1644

99. **Chittka, L.** & Osorio, D.C. (2007) Cognitive dimensions of predator responses to imperfect mimicry? *PLoS Biology* 5: e339.

98. **Chittka, L.** & Spaethe, J. (2007) Visual search and the importance of time

in complex decision making by bees. *Arthropod-Plant Interactions*, 1: 37-44.

97. Doering, T., **Chittka, L.** (2007) Visual ecology of aphids - a critical review on the role of colours in host finding. *Arthropod-Plant Interactions*, 1: 3-16.

96. Dyer, A.G., Whitney, H.M., Arnold, S. E.J., Glover, B.J., **Chittka, L.** (2007) Mutations perturbing petal cell shape and anthocyanin synthesis influence bumblebee perception of *Antirrhinum majus* flower colour. *Arthropod-Plant Interactions*, 1: 45-55.

95. Leadbeater, E. & **Chittka, L.** (2007) Social learning in insects – from miniature brains to consensus building. *Current Biology*, R703-R713

94. Leadbeater, E. & **Chittka, L.** (2007) The dynamics of social learning in an insect model, the bumblebee (*Bombus terrestris*). *Behavioral Ecology and Sociobiology*, 61: 1789-1796.

93. Raine, N.E. & **Chittka, L.** (2007) Flower constancy and memory dynamics in bumblebees. *Entomologia Generalis*, 29: 179-199

92. Raine, N.E. & **Chittka, L.** (2007) Learning a complex motor skill: bumblebees (*Bombus terrestris*) and pollen foraging. *Naturwissenschaften*, 94: 459-464 (with cover page)

91. Raine, N.E. & **Chittka, L.** (2007) Nectar Production Rates of 75 Bumblebee-visited Flower Species in a German Flora (Hymenoptera: Apidae: *Bombus terrestris*). *Entomologia generalis* 30: 191-192

90. Raine, N.E. & **Chittka, L.** (2007) The Adaptive Significance of Sensory Bias in a Foraging Context: Floral Colour Preferences in the Bumblebee *Bombus terrestris*. *PLoS One*, 2 : e556. doi:10.1371/journal.pone.0000556.

89. Saleh, N. & **Chittka, L.** (2007) Traplining in bumblebees (*Bombus impatiens*): a foraging strategy's ontogeny and the importance of spatial reference memory in short range foraging. *Oecologia*, 151: 719-730.

88. Saleh, N., Scott, A.G., Bryning, G.P., & **Chittka, L.** (2007). Distinguishing signals and cues: Bumblebees use general footprints to generate adaptive behaviour at flowers and nest. *Arthropod-Plant Interactions*, 1: 119-127

87. Skorupski P., Doering, T., **Chittka, L.** (2007) Photoreceptor spectral sensitivity in island and mainland populations of the bumblebee, *Bombus terrestris*. *Journal of Comparative Physiology* 193: 485-494.

86. Stelzer, R., Ollerton, J., **Chittka, L.** (2007) Kein Nachweis für Hummelbesuch der Kanarischen Vogelblumen (Hymenoptera: Apidae). *Entomologia generalis*, 30: 153-154.

2006

85. **Chittka, L.** & Raine, N.E. (2006) Recognition of flowers by pollinators. *Current Opinion in Plant Science*, 9: 428-435

84. Dornhaus, A., Klügl, F., Oechslein, C., Puppe, F., & **Chittka, L.** (2006) Benefits of recruitment in honey bees: ecology and colony size in an individual-based model. *Behavioral Ecology* 17, 336-344
83. Dyer, A.G., Whitney, H.M., Arnold, S.E.J., Glover, B.J. & **Chittka, L.** (2006) Bees associate warmth with flower colour. *Nature*, 442: 525-525.
82. Ings, T.C., Ward, N.L. & **Chittka, L.** (2006) Can commercially imported bumblebees out-compete their native conspecifics? *Journal of Applied Ecology*, 43, 940-948 (with cover page)
81. Leadbeater, E., Raine, N.E. & **Chittka, L.** (2006) Social learning: ants and the meaning of teaching. *Current Biology* 16, 323-325
80. Raine, N.E., Ings, T.C., Dornhaus, A., Saleh, N. & **Chittka, L.** (2006) Adaptation, chance, and history in the evolution of bee foraging behavior. *Advances in the Study of Behavior*, 36: 305- 354
79. Raine, N.E., Ings, T.C., Ramos-Rodriguez, O. & **Chittka, L.** (2006) Intercolony variation in learning performance of a wild British bumblebee population (Hymenoptera: Apidae: *Bombus terrestris audax*). *Entomologia generalis*, 28: 241-256
78. Saleh, N. & **Chittka, L.** (2006) The importance of experience in the interpretation of conspecific chemical signals. *Behavioral Ecology and Sociobiology*, 61: 215-220
77. Saleh, N., Ohashi, K., Thomson, J.D., **Chittka, L.** (2006) Facultative use of repellent scent marking in foraging bumblebees: complex versus simple flowers. *Animal Behaviour* 71, 847-854
76. Skorupski, P., **Chittka, L.** (2006) Animal Cognition: an Insect's Sense of Time? *Current Biology*, 16: R851-R853
75. Skorupski, P., Spaethe, J., **Chittka, L.** (2006) Visual Search and Decision Making in Bees: Time, Speed and Accuracy. *International Journal of Comparative Psychology* 19, 342-357
74. Spaethe, J., Tautz, J., **Chittka, L.** (2006) Do honeybees detect colour targets using serial or parallel visual search? *Journal of Experimental Biology* 209, 987-993.

2005

73. **Chittka, L.** & Brockmann, A. (2005) Perception space, the final frontier. *PLoS Biology*, 3: 545-549.
72. **Chittka, L.** & Leadbeater, E. (2005) Social learning: public information in insects. *Current Biology*, 15: R869-R871.
71. **Chittka, L.** & Kevan, P.G. (2005) Flower colour as advertisement. In Dafni, A., Kevan, P.G., Husband, B.C. (eds.) *Practical Pollination Biology*. Enviroquest Ltd., Cambridge, ON, Canada, pp. 157 - 196

70. Dornhaus, A. & **Chittka, L.** (2005) Bumble bees store both food and information in honeypots. *Behavioral Ecology*, 16: 667-673
69. Dyer, A., Neumeyer, C., **Chittka, L.** (2005) Honeybees (*Apis mellifera*) can discriminate between and recognise images of human faces. *Journal of Experimental Biology*, 208: 4709-4714 (with cover page, and coverage in *New Scientist*)
68. Heiling, A.M., Cheng, K., **Chittka, L.**, Goeth, A. & Herberstein, M.E. (2005) The role of UV in crab spider signals: effects on perception by prey and predators. *Journal of Experimental Biology*, 208: 3925-3931
67. Heiling, A.M., **Chittka, L.**, Cheng, K. & Herberstein, M.E. (2005) Colouration in crab spiders – substrate choice and prey attraction. *Journal of Experimental Biology*, 208: 1785-1792
66. Ings, T., Schikora, J. & **Chittka, L.** (2005) Bumblebees, humble pollinators or assiduous invaders? A population comparison of foraging performance in *Bombus terrestris*. *Oecologia*, 144: 508-516
65. Ings, T., Raine, N.E. & **Chittka, L.** (2005) Mating Preference of Commercially Imported Bumblebees (*Bombus terrestris*) in Britain (Hymenoptera: Apidae). *Entomologia generalis*, 28: 233-238
64. Leadbeater, E. & **Chittka, L.** (2005) A new mode of information transfer in bumblebees. *Current Biology*, 15: 447-448. (with commentary in *Nature*, *Science News*, and *The Guardian*)
63. Lotto, R.B. & **Chittka, L.** (2005) Seeing the light: Illumination as a contextual cue to color choice behavior in bumblebees. *Proceedings of the National Academy of Sciences*, 102: 3852-3856
62. Mena Granero, A., Guerra Sanz, J.M., Egea Gonzalez FJ, Martinez Vidal, JL, Dornhaus, A. Ghani, J., Roldán Serrano, A., **Chittka, L.** (2005) Chemical compounds of the foraging recruitment pheromone in bumblebees. *Naturwissenschaften*, 92: 371-374.
61. Raine, N.E. & **Chittka, L.** (2005) Comparison of flower constancy and foraging performance in three bumblebee species (Hymenoptera: Apidae: Bombus). *Entomologia generalis*, 28: 81-89.
60. Raine, N.E. & **Chittka, L.** (2005) Colour preferences in relation to the foraging performance and fitness of the bumblebee *Bombus terrestris*. *Uludag Bee Journal*, 5: 145-150 (with cover page).
59. Rasmont, P., Regali, A., Ings, T.C., Lognay, G., Baudart, E., Marlier, M., Delcarte, E., Viville, P., Marot, C., Falmagne, P., Verhaeghe, J.-C. & **Chittka, L.** (2005). Analysis of the pollen and nectar of *Arbutus unedo* as a food source for *Bombus terrestris* (Hymenoptera, Apidae). *Journal of Economic Entomology*, 98: 656-663

58. **Chittka, L.** (2004) Dances as windows into insect perception. *PLoS Biology* 2: 898-900.
57. **Chittka, L.**, Ings, T. & Raine, N.E. (2004) Chance and adaptation in the evolution of island bumblebee behaviour. *Population Ecology* 46: 243-251
56. **Chittka, L.**, Wells, H. (2004) Color vision in bees: mechanisms, ecology and evolution. In: Prete, F.R.: Complex Worlds from simpler nervous systems; MIT Press, Boston pp. 165-191.
55. Dornhaus, A. & **Chittka, L.** (2004) Information flow and regulation of foraging activity in bumble bees (*Bombus* spp). *Apidologie* 35: 183-192.
54. Dornhaus, A. & **Chittka, L.** (2004) Why do honeybees dance? *Behavioural Ecology and Sociobiology* 55: 395-401.
53. Dyer, AG. & **Chittka, L.** (2004) Bumblebees (*Bombus terrestris*) sacrifice foraging speed to learn difficult colour discrimination tasks. *Journal of Comparative Physiology A*, 190: 759-763.
52. Dyer, AG. & **Chittka, L.** (2004) Biological significance of discriminating between similar colours in spectrally variable illumination: bumblebees as a study case. *Journal of Comparative Physiology A*, 190: 105-114.
51. Dyer, AG. & **Chittka, L.** (2004) Bumblebee search times without ultraviolet light. *Journal of Experimental Biology*, 207: 1683-1688.
50. Dyer, AG. & **Chittka, L.** (2004) Fine colour discrimination requires differential conditioning in bumblebees. *Naturwissenschaften*, 91: 224-227.
49. Smith, C., Barber, I., Wootton, R.J. & **Chittka, L.** (2004) A receiver bias in the origin of threespine stickleback mate choice. *Proceedings of the Royal Society London, Series B*, 271: 949-955.

2003

48. **Chittka, L.**, Dyer, A.G., Bock, F. & Dornhaus, A. (2003) Bees trade off foraging speed for accuracy. *Nature*, 424: 388-388.
47. **Chittka, L.** & Tautz, J (2003) The spectral input to honeybee visual odometry. *Journal of Experimental Biology*, 206: 2393-2397.
46. Dornhaus, A., Brockmann, A. & **Chittka, L.** (2003) Bumble bees alert to food with pheromone from tergal gland. *Journal of Comparative Physiology A*, 189: 47-51.
45. Heiling, A. M., Herberstein, M. E. & **Chittka, L.** (2003) Crab-spiders manipulate flower signals. *Nature*, 421: 334-334.
44. Spaethe, J. & **Chittka, L.** (2003) Interindividual variation of eye optics and single object resolution in bumblebees. *Journal of Experimental Biology*, 206: 3447-3453.

2002

43. **Chittka, L.** (2002) The influence of intermittent rewards on learning to handle flowers in bumblebees. *Entomologia generalis* 26: 85-91.

2001

42. Briscoe, A. & **Chittka, L.** (2001) The evolution of colour vision in insects. *Annual Review of Entomology* 46, 471-510.

41. **Chittka, L.** (2001) Camouflage of Predatory Crab Spiders on Flowers, and the Colour Perception of Bees. *Entomologia generalis* 25, 181-187.

40. **Chittka, L.**, Briscoe, A. (2001) Why sensory ecology needs to become more evolutionary – insect color vision as a case in point. In Barth, F.G., Schmid, A. (ed.) *Ecology of Sensing*, Springer Verlag, Berlin, pp.19-38

39. **Chittka, L.**, Schürkens S. (2001) Successful invasion of a floral market. *Nature* 411, 653-653.

38. **Chittka, L.** & Thomson, J.D. (2001) Cognitive Ecology – Preface. In: **Chittka, L.** & Thomson, J.D. (eds.) *Cognitive Ecology of Pollination*. Cambridge University Press, Cambridge, pp. x-xiii.

37. **Chittka, L.**, Spaethe, J., Schmidt, A., Hickelsberger, A. (2001) Adaptation, constraint, and chance in the evolution of flower color and pollinator color vision. In: **Chittka, L.** & Thomson, J.D. (eds.) *Cognitive Ecology of Pollination*. Cambridge University Press, Cambridge, pp. 106-126

36. Dornhaus, A., **Chittka, L.** (2001). Food alert in bumblebees: possible mechanisms and evolutionary implications. *Behavioral Ecology and Sociobiology*, 50: 570-576.

35. Kevan, P.G., **Chittka, L.**, Dyer, A. (2001) Limits to the salience of ultraviolet – lessons from color vision in bees and birds. *Journal of Experimental Biology*, 204: 2571-2580.

34. Schürkens, S., **Chittka, L.** (2001) The significance of the invasive Crucifer species *Bunias orientalis* (Brassicaceae) as a nectar source for central European insects. *Entomologia generalis* 25: 115-120.

33. Spaethe, J., Tautz, J., **Chittka, L.** (2001) Visual constraints in foraging bumble bees: flower size and colour affect search time and flight behavior. *Proceedings of the National Academy of Sciences*, 98: 3898-3903.

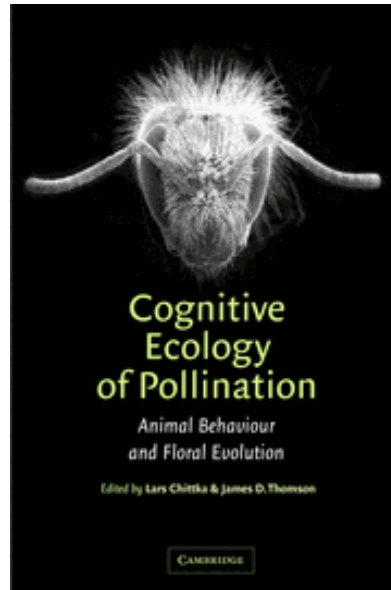
32. Thomson, J.D. & **Chittka, L.** (2001) Pollinator individuality: when does it matter? In: **Chittka, L.** & Thomson, J.D. (eds.) *Cognitive Ecology of Pollination*. Cambridge University Press, Cambridge, pp. 191-213

Chittka, L. and Thomson, J.D. (eds.) 2001 Cognitive Ecology of Pollination - Animal Behavior and Floral Evolution. Cambridge University Press, 423pp.

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1999

31. **Chittka, L.** (1999) Bees, white flowers, and the color hexagon – a reassessment? No, not yet. *Naturwissenschaften* 86, 595-597.
30. **Chittka, L.**, Thomson, J.D. Waser, N.M (1999) Flower constancy, insect psychology, and plant evolution. *Naturwissenschaften* 86: 361-377.
29. **Chittka, L.**, Williams, N., Rasmussen, H., Thomson, J.D. (1999). Navigation without vision –bumble bee orientation in complete darkness. *Proceedings of the Royal Society London, Series B*, 266: 45-50. (with commentary in *Science News*)
28. Dornhaus, A., **Chittka, L.** (1999) Evolutionary origins of bee dances. *Nature* 401: 38-38.
27. Gumbert, A., Kunze, J. **Chittka, L.** (1999) Flower color diversity in plant communities, bee color space, and a null model. *Proceedings of the Royal Society, London, Series B*, 266: 1711-1716.

1998

26. **Chittka, L.** (1998) Sensori-motor learning in bumble bees: long term retention and reversal training. *Journal of Experimental Biology* 201: 515-524 (with commentary in *New Scientist*)
25. Menzel, R., Geiger, K., Mueller, U., Joerges, J. and **Chittka, L.** (1998) Bees travel novel homeward routes by integrating separately acquired vector memories. *Animal Behaviour*, 55: 139-152
24. Waser, N.M. & **Chittka, L.** (1998) Bedazzled by flowers. *Nature* 394: 835-836

1997

23. **Chittka, L.** (1997) Bee color vision is optimal for coding flower colors, but flower colors are not optimal for being coded - why? *Israel Journal of Plant Sciences* 45: 115-127
22. **Chittka, L.**, Gumbert, A., and Kunze, J. (1997) Foraging dynamics of bumble bees: correlates of movements within and between plant species. *Behavioral Ecology* 8: 239-249
21. **Chittka, L.**, Schorn, J., de Souza, J.M., Ventura, D.F., and Camargo, J.M.F. (1997) The nest entrance signal of the Amazonian bees *Partamona pearsoni* - a case where insects design their own flight targets. In: Kipyatkov, V.E. (ed.) Proceedings of the Colloquia on Social Insects, Volume 3-4, pp.107-116
20. **Chittka, L.** and Thomson, J.D (1997) Sensori-motor learning and its relevance for task specialization in bumble bees. *Behavioral Ecology and Sociobiology* 41: 385-398
19. **Chittka, L.** & Waser, N.M. (1997) Why red flowers are not invisible for bees. *Israel Journal of Plant Sciences* 45: 169-183 (with commentary in *TREE*)

1996

18. **Chittka, L.** (1996). Optimal sets of colour receptors and opponent processes for coding of natural objects in insect vision. *Journal of Theoretical Biology* 181: 179-196
17. **Chittka, L.** (1996). Does bee colour vision predate the evolution of flower colour? *Naturwissenschaften*, 83: 136-138. (with commentary in *Discover Magazine*)
16. Kevan, P.G., Giurfa, M., and **Chittka, L.** (1996). Why are there so many and so few white flowers? *Trends in Plant Sciences*, 1:280-284.
15. Lunau, K., Wacht, S., and **Chittka, L.** (1996) Colour choices of naive bumble bees and their implications for colour perception. *Journal of Comparative Physiology A* 178: 477-489.
14. Menzel, R., Geiger, K., **Chittka, L.**, Joerges, J., Kunze, J., and Mueller, U. (1996) The knowledge base of bee navigation. *Journal of Experimental Biology* 199:141-146.
13. Waser, N.M., **Chittka, L.**, Price, M.V., Williams, N., and Ollerton, J. (1996) Generalization in pollination systems, and why it matters. *Ecology* 77: 1043-1060.

1995

12. **Chittka, L.** and Geiger, K. (1995) Can honeybees count landmarks? *Animal Behaviour* 49:159-164 (with commentary in *New Scientist*)
11. **Chittka, L.** and Geiger, K. (1995) Honeybee long-distance orientation in a controlled environment. *Ethology* 99:117-126.
10. **Chittka, L.**, Kunze, J., and Geiger, K. (1995) The influences of landmarks on distance estimation of honeybees. *Animal Behaviour* 50:23-31.

9. **Chittka, L.**, Kunze, J., Shipman, C., and Buchmann, S.L. (1995) The significance of landmarks for path integration of homing honey bee foragers. *Naturwissenschaften* 82:341-343.

8. Giurfa, M., Nunez, J., **Chittka, L.**, and Menzel, R. (1995) Colour preferences of flower-naive honeybees. *Journal of Comparative Physiology A* 177:247-259.

1994

7. **Chittka, L.**, Shmida, A., Troje, N., and Menzel, R. (1994) Ultraviolet as a component of flower reflections, and the colour perception of Hymenoptera. *Vision Research* 34:1489-1508.

1993

6. **Chittka, L.** (1993) The colour perception of Hymenoptera, the colours of flowers, and their evolutionary and ecological relationship. PhD Dissertation, Free University of Berlin.

5. **Chittka, L.**, Vorobyev, M., Shmida, A., and Menzel, R. (1993) Bee colour vision - the optimal system for the discrimination of flower colours with three spectral photoreceptor types? In: *Sensory Systems of Arthropods*, edited by Wiese, K., Gribakin, F.G., Popov, A.V., and Renninger, G. Basel/Switzerland: Birkhäuser Verlag, p. 211-218.

1992

4. **Chittka, L.** (1992) The color hexagon: a chromaticity diagram based on photoreceptor excitations as a generalized representation of colour opponency. *Journal of Comparative Physiology A* 170:533-543.

3. **Chittka, L.**, Beier, W., Hertel, H., Steinmann, E., and Menzel, R. (1992) Opponent colour coding is a universal strategy to evaluate the photoreceptor inputs in hymenoptera. *Journal of Comparative Physiology A* 170:545-563.

2. **Chittka, L.** and Menzel, R. (1992) The evolutionary adaptation of flower colors and the insect pollinators' color vision systems. *Journal of Comparative Physiology A* 171:171-181.

1990

1. Menzel, R., **Chittka, L.**, Eichmüller, S., Geiger, K., Peitsch, D., and Knoll, P. (1990) Dominance of celestial cues over landmarks disproves map-like orientation in honey bees. *Zeitschrift für Naturforschung* 45c:723-726.

POPULAR SCIENTIFIC ARTICLES

19. **Chittka, L.** (2023) The inner lives of insects. *Scientific American* 329(1): 26-33

This article also appeared in Italian as **Chittka, L.** (2023) La vita interiore degli insetti. *Le Scienze* (Ottobre) 72-79.

18. **Chittka, L.** (2022) The intelligent mind of an insect. *Interalia Magazine* (November 2022 issue, "Other Minds")

17. **Chittka, L.** (2022) Bienen – Bewusstsein. *Bienen und Natur*, December 2022, 32-35

16. **Chittka, L.** (2022) The consciousness of bees. *Washington Post*

<https://www.washingtonpost.com/outlook/2022/07/29/bee-cognition-insect-intelligence-research/>

15. **Chittka, L.** (2022) “Personality” differences between bees. *Natural History*, 130(9), 17-23
14. Gibbons, M., Crump., A., **Chittka, L.** (2022) Insects may feel pain, says growing evidence – here’s what this means for animal welfare laws. *The Conversation*. <https://theconversation.com/insects-may-feel-pain-says-growing-evidence-heres-what-this-means-for-animal-welfare-laws-195328>
13. **Chittka, L.** (2020) Entomological rock music. *Antenna* 44(2):62-63
12. **Chittka, L.** & Wilson, C. (2018) Bee-brained. *Aeon* (November 27, 2018): <https://aeon.co/essays/inside-the-mind-of-a-bee-is-a-hive-of-sensory-activity> (with a commentary in Nature)
11. **Chittka, L.** (2018) A bee as pet – a bee psychologist’s perspective. *Antenna* 42(1): 4-5
10. **Chittka, L.** (2018) Intelligente Bienen. *Deutsches Bienenjournal* 26(2): 14-16.
9. **Chittka, L.** & Walker, J. (2011) Insects as art lovers. *Artlink*, 31: 46-48.
8. Molet, M., **Chittka, L.**, Raine, N.E. (2009) Bumblebee foraging pheromones. *Bee Craft*, July 2009, p.20.
7. Doering, T.F., Hardie, J., Leather, S., Spaethe, J., **Chittka, L.** (2008) Can aphids play football? *Antenna* 32: 146-148.
6. **Chittka, L.** (2007) Seeing red by accident? *Planet Earth*, Autumn 2007, pp. 30-31.
5. **Chittka, L.** & Walker, J. (2007) Insects as art lovers: Bees for Van Gogh. *Antennae*, 2: 37-42.
4. Döring, T.F. & **Chittka, L.** (2007) Lesley Goodman Award Public Lecture Series on Insect Vision. *Antenna* 31: 187-188.
3. Whitney, H.M. & **Chittka, L.** (2007) Warm flowers, happy pollinators. *Biologist* 54, 154-159.
2. **Chittka, L.** & Walker, J. (2006) Do bees like Van Gogh’s Sunflowers? *Optics and Laser Technology* 38: 323-328 (with coverage on BBC and ABC news, Science, New Scientist, Art Monthly, The Times, and multiple radio stations)
1. **Chittka, L.** & Dornhaus, A. (1999) Comparisons in physiology and evolution, and why bees can do the things they do. *Ciencia al Dia International* 2 (2): 1-17 (electronic publication) <http://www.ciencia.cl/CienciaAlDia/volumen2/numero2/articulos/articulo5.html>

BOOK REVIEWS

12. **Chittka, L.** (2023) The doors of animal perception. *American Scientist* 111: 55-57
11. **Chittka, L.** (2022) The mind of the bee - a journey into the alien mind of an insect. Wellbeing International: <https://wellbeingintl.org/the-mind-of-the-bee/>

10. **Chittka, L.** (2018) The past, present and future of the beasts that may have made our brains. A review of *Buzz – The Nature and Necessity of Bees* by T. Hanson. *Current Biology*, 28(13): R722–R723. DOI: <https://doi.org/10.1016/j.cub.2018.04.091>
9. **Chittka, L.** & Mesoudi, A. (2011) Insect Swarm Intelligence. A review of: *Honeybee Democracy* by T.D. Seeley. *Science*, 331: 401-402.
8. **Chittka, L.** (2007) A review of: *Letters from the Hive – An Intimate History of Bees, Honey, and Humankind*. Buchmann S & Banning R. *Entomologia Generalis*, 29: 164.
7. **Chittka, L.** (2007) A review of: *Asian Honey Bees – Biology, Conservation, and Human Interactions*. Oldroyd BP & Wongsiri S. *Entomologia Generalis*, 29: 284.
6. **Chittka, L.** (2007) A review of: *A Field Guide in Colour to Bees and Wasps*. Zahradnik J & Severa F. *Entomologia Generalis*, 29: 134.
5. **Chittka, L.** (2007) A review of: *Bumblebees*. Prys-Jones OE & Corbet SA. *Entomologia Generalis*, 29: 123.
4. **Chittka, L.** (2007) A review of: *Bumblebees – Behaviour and Ecology*. Goulson DG. *Entomologia Generalis*, 29: 314
3. **Chittka, L.** (2003) Plants and animals, forever entangled. A review of: “Plant-Animal Interactions”. C. Herrera & O. Pellmyr (eds.) *Trends in Ecology and Evolution*, 18: 12-13.
2. **Chittka, L.** (1999) Spatial Representation in Animals. Sue Healy (ed.) *Animal Behaviour* 57: 735-736
1. **Chittka, L.** (1999) Learning and Adaptation. A review of: "Cognitive Ecology: The Evolutionary Ecology of Information Processing and Decision Making". Reuven Dukas (ed.) *Quarterly Review of Biology*, 74: 326-327

SELECTED MEDIA COVERAGE

- 2023** Article in leading German news magazine *Der Spiegel*: Biologe Lars Chittka: Der Herr der Bienen 24/2/2023 <https://www.spiegel.de/wissenschaft/biologe-lars-chittka-der-herr-der-bienen-a-127e39ad-634c-46cb-bed5-757702f3a314>
Article about my work in *Greenpeace Magazin* (Ausgabe 6.23 "Tierintelligenz"); Das große Knobeln. Was Insekten alles können – Laborbesuch in London
- 2022** Article about my work on insect sentience and intelligence in the journal *Newsweek*: <https://www.newsweek.com/do-insects-have-brains-1683193>
Article in the *Observer / The Guardian* (16/7/22): ‘Bees are really highly intelligent’: the insect IQ tests causing a buzz among scientists: <https://www.theguardian.com/environment/2022/jul/16/bees-are-really-highly-intelligent-the-insect-iq-tests-causing-a-buzz-among-scientists>
- 2021** 7-page print article about me and my team's work in Dutch popular scientific journal *KIJK* about the intelligence of bees. Published November 2021, entitled: *Bijenonderzoeker Lars Chittka: Ik wil dat meer mensen weten dat bijen een rijk mentaal leven hebben* (I wish that more people were aware that bees have a rich mental life). <https://tijdschriftnu.nl/products/kijk-editie-11-2021>
- 2020** Interview on *Big Biology* podcast “Smarthropods – Cognition in Insects” (37 minutes; <https://www.bigbiology.org/podcast>)
Interview in *BYU Radio* “Constant Wonder: Smart Bees” (aired 30/3/2020; 50 minutes) <http://byuradiostage.byu.edu/episode/bd8dc260-e7b0-44ce-a3bb-a7d613d49c55/constant-wonder-smart-bees?autoplay=true>
- 2019** Portrait in *BBC Wildlife Magazine* “Meet the Scientist” (November 2019 issue; p.28)

- <https://www.pressreader.com/uk/bbc-wildlife-magazine/20191024/282664689156186>
Reuters Video clip about my music album Strange Flowers: “Sex, death, rock 'n' roll: the life of a bee”
<https://finance.yahoo.com/video/sex-death-rock-n-roll-152856137.html>
- 2018** TV Interview with Alexander Kluge “Der Geist der Bienen” (dctp, RTL and SRF; 14/02/2018; 24 minutes); https://www.youtube.com/watch?v=RAr8vd_EZCw
Portrait in Frankfurter Allgemeine Zeitung “Das geistige Leben der Bienen” 13/6/2018
Portrait in Tagesspiegel (Berlin) “Maximum im Minihirn” 25/5/2018
- 2016** The Guardian – Facebook page 19/10/2016 Video about my team’s bumblebee work “Bees can learn mad skills: <https://www.facebook.com/theguardian/videos/577812755739825> - viewed 24 Million times (as of Oct 2020)
- 2010** Interview on Mongabay (with Jeremy Hance) “Uncovering the intelligence of insects, an interview with Lars Chittka” <https://news.mongabay.com/2010/06/uncovering-the-intelligence-of-insects-an-interview-with-lars-chittka/>

RESEARCH GRANTS

44. Open Philanthropy / Good Ventures Foundation (2024-2026) Addressing key evidence gaps in the science of insect sentience; £760,184
43. Japanese Society for the Promotion of Science – JSPS (2022-2024) Postdoctoral fellowship to Dr Mai Morimoto to work in the Chittka team; £81,000
42. Horizon Europe Framework Programme (2022-2025) NimbleAI - Ultra energy-efficient and secure neuromorphic sensing and processing at the endpoint. Total: €9,999,433; Queen Mary contribution €187,603
41. European Research Council (ERC; 2019-2024) Foundations of Animal Sentience – ASENT (with PI Jonathan Birch at LSE). Total: €1,499,864; Queen Mary Contribution: €14,563
40. Fyssen Foundation (2020-2022) The interface between chemical and spatial use of bumble bee male pre-mating behaviour €60,000
39. Fellowship at the Wissenschaftskolleg / Institute for Advanced Study (2017-2018) Housing allowance plus replacement lectureship: €79,649
38. The Leverhulme Trust: *Artist in Residence: Dr Robert Hudson* 2016-AIR-037 (2017) £13,028
37. EPSRC Program Grant: *Brains on Board: Neuromorphic Control of Flying Robots* EP/P006094/1 (2017-2022, jointly with collaborators in Sussex and Sheffield); total: £4,816,675 Queen Mary contribution: £ 1,085,942
36. ‘Large Award’ by Queen Mary’s Centre for Public Engagement: Observing bees in East London – Pollinator-friendly Gardens (2015-2016) £18,019
35. HFSP Program Grant: RGP0022/2014 - A neural circuit approach to cognition and its limits in microbrains – with Martin Giurfa (U Toulouse) and Jeff Riffell (U Washington) (2014-2018) USD \$ 1,050,000 – QMUL contribution \$350,000
34. NERC: Behavioural and molecular responses to pesticide exposure in bumblebees – with PI Yannick Wurm, QMUL (2014-2017) £515,549
33. Royal Society Wolfson Research Merit Award (2014-2019) £50,000
32. European Research Council (ERC): SpaceRadarPollinator (339347) Space use by bees– radar tracking of spatial movement patterns of key pollinators (2014-2019) €3,435,922
31. Host for postdoc Dr Sylvain Alem: Could learned mate choice pave the way to speciation in fruit flies? Fyssen Foundation (2013-2015) €48,000
30. Host for postdoc Dr Stephan Wolf funded by German Research Foundation (DFG): Bumblebee males and queens as a model to understand the mating-foraging trade-off in animals (2013-2015) ca £ 100,000
29. Host for postdoc Dr Vera Vasas funded by Human Frontiers Science Program: Evolving models of visual category learning in bees (2011-2017) £101,880

28. European Commission: Host for postdoc Dr Clint Perry funded by Marie Curie International Incoming Fellowship: Smart foraging: neuronal complexity, cognition and foraging in honey bees (2013-2015) €299,558
27. European Commission: Host for postdoc Dr David Baracchi funded by Marie Curie Intra-European Fellowship: Colony Personality and Pace-of-Life Syndrome in Bumblebees (2013-2015) €221,606
26. Australian Research Council: Pollination in a new climate: Evolutionary simulation of bee and flower interactions for predicting impacts of climate change on pollination (2012-2015; jointly with PI Alan Dorin and Adrian Dyer) \$300k AUD
25. CEE (Centre for Ecology and Evolution): Honeybees and honeywasps: stealing information from competitors? (2012-2013) £4,642
24. Host for postdoc Dr Vivek Nityananda funded by *Marie Curie* International Incoming Fellowship: Visual Search in Bumblebees (2011-2013) £ 142,210.
23. Host for postdoc Dr Aurore Avergues-Weber funded by *Fyssen Foundation*: Social learning in pollinators (2011-2012) €50,000
22. Host for postdoc funded by *Human Frontiers Science Program*: The Psychophysics of Attention in Insects (2010-2013) £ 97,780
21. Discipline Bridging Award QMUL/EPSRC/MRC (2009)
Statistical physical analysis of the dynamics of foraging bumblebees (with P.I. R. Klages)
£ 7,000
20. NERC (NE/F523342/1; 2007-2008)
Application of the bumblebee foraging pheromone for commercial greenhouse pollination
£ 98,149.40
19. Wellcome Trust, BBSRC and EPSRC Cognitive Systems Foresight Project (BB/F52765X/1; 2007-2010)
Bees and the travelling salesman problem: how tiny brains solve complex cognitive tasks
£ 372,745.06
18. NERC (2006-2009) NE/D012813/1
Quantifying the dynamics of predator avoidance learning: bumblebees as a model
£ 334,418.11
17. The Leverhulme Trust (2005-2008)
Elucidating the ecological basis of invertebrate colour processing and perception
(with P.I. Beau Lotto at UCL London, and collaborators A. Sillito (UCL) and D. Osorio (U Sussex))
£ 207,426.00
16. NERC (2005-2008)
Dissecting the interaction between pollinator behaviour and a single plant gene controlling floral morphology
(with P.I. Beverley Glover, University of Cambridge)
£ 188,207.23
15. Central Research Fund, University of London (2004)
Intracellular recordings from bee photoreceptors
£ 5,251
14. NERC (2004-2005)
Pollination of the Canary Island “bird flowers” – a new experimental approach to generalist vs. specialist tradeoffs
£ 31,052.04
13. NERC (NER/A/S/2003/00469; 2004-2007)
The evolution of learning – bumblebees as a model
£ 332,520.37
12. British Ecological Society (2003)
The invasion of introduced commercial bumblebees into non-native areas
£ 995
11. Australian Research Council (2003-2006)

Deceptive signals in spiders
(with PI ME Herberstein and K Cheng, Macquarie University, Australia)
£ 86,611

10. NERC (2003-2004)
Island populations as a source for sensory innovation – bumblebee colour vision as a model
£ 29,801

9. The Wellcome Trust (2003-2005)
Empirical vision: investigating the role of experience in shaping colour constancy behaviour
(with PI Beau Lotto, Institute of Ophthalmology, University College, London)
£ 94,425

8. Central Research Fund, University of London (2003)
Visual search in bumblebees
£ 7,000

7. University of Würzburg Travel Fund (2002)
Behaviour of Sardinian bumblebee populations
£ 1,850

6. University of Würzburg Travel Fund (2001)
Measuring floral spectral reflectance in Sardinia
£ 1,800

5. Universitätsbund Würzburg 00-26 (2000)
The evolution of colour preferences in bumblebees
£ 3,400

4. DFG Ch 147/3-1 (2001-2002)
Heisenberg Award
£ 87,000

3. DFG SFB 554 Project B5 (1999-2002)
Memory dynamics and foraging in bumblebees
£ 90,000

2. DFG Ch 147/2-1 (1998-2000)
Flower constancy of bumblebees
£ 40,000

1. DFG Postdoctoral Stipend (1994-1997)
Foraging strategies of bees on flowers
£ 50,400

EDITORIAL WORK

Member, Editorial Board, *PLoS Biology* (2004-present)

Guest Editor, *PNAS* (2023)

Member, Editorial Board, *Communicative & Integrative Biology* (2008-present)

Guest Editor, *Frontiers in Systems Neuroscience*, special volume on *Comparative Animal Consciousness* (2021-22)

Guest Editor, *Frontiers in Psychology*, special volume on *The Frontiers of Insect Cognition* (2018)

Guest Editor, *Current Opinion in Insect Science*, special volume on
Molecular and neural mechanisms underpinning adaptive behaviour in insects (2016)

Associate Editor, *Proc Royal Soc Lond B* (2010-2012)

Member, Editorial Board, *Uludag Bee Journal* (2002; 2006-2014)

Member, Editorial Board, *Psyche* (2007-2010)

Member, Editorial Board, *Entomologia generalis* (2006-2009)

Member, Editorial Board, *Arthropod-Plant Interactions* (2006-2015)

Member, Advisory Board, *Quarterly Review of Biology* (2004-2010)

FUNDING AGENCY PANEL MEMBERSHIP

- **Romanian National Research Council** (CNCS, Biology & Ecology panel member LS5.7) 2024
- **Research Council of Finland** (Ecology and Evolutionary Biology), Panel member, 2024
- **Fundação para a Ciência e a Tecnologia, I. P. (FCT, Portugal)**
Evaluation of the R&D Units Multianual Funding Program (Biological Sciences, Biodiversity and Ecosystems Panel) 2024
Biological Sciences Panel, 2023
- **MSCA (Marie Skłodowska-Curie Actions)** Postdoctoral Fellowships Evaluator, 2022
- **Monitor of the H2020 project:** 773921 - "PoshBee", 2022
- **Bulgarian National Science Fund BNSF**
Panel Chair (VIHREN Call – ERC style grants), 2019
Panel Member (VIHREN Call – ERC style grants), 2021
Evaluator of research projects submitted for Implementation of Investment BG-RRP-2.004 - "Establishment of a network of research universities in Bulgaria" 2022
- **European Research Council (ERC)**
Synergy Grants, external panel member, 2020
Synergy Grants, panel member SyG3A, 2019
Consolidator Grants, Shadow panel chairman LS8, 2012, 2014
Consolidator Grants, Panel chairman LS8, 2011, 2013
Starting Grants, Panel member (deputy chairman in 2010) LS8, 2007-2010
- **Royal Society Research Grants**, Panel member, Board H 2008-2011

EXTERNAL EXAMINING etc

- PhD Thesis, University of Sussex, UK (2018)
- PhD Thesis, Royal Veterinary College, London, UK (2015)
- Evaluation of nomination to the Australian Academy of Sciences (2015)
- PhD Thesis, University of Groningen, The Netherlands (2015)
- PhD Thesis, University of Bristol, UK (2015)
- External Evaluation of nomination for Gottfried Wilhelm Leibniz Prize (most prestigious award of the German Research Foundation – DFG; 2015)
- PhD Thesis, Martin-Luther University Halle – Wittenberg (2014)
- PhD Thesis, Royal Holloway University of London (2014)
- REF (Research Excellence Framework) ‘dry run’ for Anglia Ruskin University (2013)
- PhD Thesis, RMIT University, Melbourne, Australia (2013)
- Agence d'Evaluation de la Recherche et des établissements d'Enseignement Supérieur (AERES) – Evaluation of LEEC (Laboratory of Comparative Experimental Ethology, University of Paris - 13) (2013)
- MSc Thesis, University of Sussex, UK (2012)
- PhD Thesis, University of Bristol, UK (2010)
- PhD Thesis, Université de Neuchâtel, Switzerland (2009)
- PhD Thesis, University of Toulouse, France (2009)
- 2005-2008 External examiner for Physiology/Behaviour/Ecology undergraduate courses; University of Sussex, UK
- PhD Thesis, University of Bern, Switzerland (2008)
- PhD Thesis, University of Lausanne, Switzerland (2008)

- PhD Thesis, University of Toulouse, France (2007)
- Habilitation Dissertation, University of Tours, France (2007)
- Ph.D. thesis, David Booth, University of Sussex, UK (2004)
- Ph.D. thesis, Roselle Chapman, UC London, UK (2004)
- MSc thesis, Christine Harbig, Würzburg University, Germany (2003)
- Ph.D. thesis, Andreas Keller, Würzburg University, Germany (2002)
- Ph.D. thesis, Adrian Geoffrey Dyer, Monash University, Australia (2000)

FEEDBACK ON PROMOTIONS AND RECRUITMENTS AT OTHER INSTITUTIONS

- 2024 Evaluation of Appointment to Associate Professor, University of Rochester, USA
- 2022 Evaluation of Promotion to Senior Lecturer, University of Sussex, UK
- 2021 Evaluation of Promotion to Full Professor, Haifa University, Israel
- 2021 Evaluation of Promotion to Associate Professor, Pennsylvania State University, USA
- 2020 Evaluation of Promotion to Full Professor, Tel Aviv University, Israel
- 2020 Evaluation of Promotion to Associate Professor, University of Trento, Italy
- 2020 Evaluation of Promotion to Reader, NCBI, Tata Institute Bangalore, India
- 2019 Evaluation of Promotion to Full Professor, University of Sussex, UK
- 2018 Evaluation of Promotion to Associate Professor, University of Missouri, St. Louis, US
- 2018 Evaluation of Promotion to Full Professor, University of Sussex, UK
- 2017 Evaluation of Promotion to Associate Professor, Rockefeller University, US
- 2017 Evaluation of Promotion to Full Professor, Ben Gurion University, Israel
- 2016 Evaluation of Promotion to Full Professor, University of Michigan, Ann Arbor
- 2016 Evaluation of Promotion to Full Professor, University of Wisconsin, Madison
- 2015 Performance Evaluation for Smithsonian Tropical Institute, Panama
- 2015 Evaluation of promotion to Full Professor, University of Arizona, Tucson, USA
- 2015 Evaluation of promotion to Associate Professor, Trinity College Dublin, Ireland
- 2015 Evaluation of retention offer, University College, Cork, Ireland
- 2014 Evaluation of promotion to Full Professor, University of Texas, Austin, USA
- 2014 Evaluation of promotion to Full Professor, University of Cincinnati, USA
- 2014 Evaluation of promotion of Researcher from Band E to F (Rothamsted Research, UK)
- 2013 Evaluation of promotion to Full Professor, RHUL, UK
- 2013 Evaluation of promotion to Professor Haver, University of Haifa, Israel
- 2012 Evaluation of promotion to Full Professor, Hebrew University of Jerusalem, Israel
- 2012 Evaluation of promotion to Full Professor, University of St Andrews, UK
- 2012 Evaluation of promotion to Full Professor, McMaster University, Canada
- 2011 Evaluation of promotion to Full Professor, University of California, Irvine
- 2011 Evaluation of recruitment at Assoc. Prof. level, Okinawa Institute of Science and Technology (OIST), Japan
- 2011 Evaluation of promotion to Assoc. Prof., University of Michigan, Ann Arbor, USA
- 2011 Evaluation of promotion to Reader, RHUL, UK
- 2011 Recruitment to Assistant Professor, University of Queensland, Australia
- 2010 Recruitment to Assistant Professor, NCBS, Bangalore, India
- 2009 Evaluation of promotion to Full Professor, University of California, San Diego
- 2009 Evaluation of promotion to Assoc. Prof., University of Texas, Austin, USA
- 2009 Evaluation of promotion to Full Prof., Australian Natl. University, Canberra
- 2008 Evaluation of promotion to Professor, UCL, UK

- 2007 Evaluation of promotion to IM Level 3, BBSRC Rothamsted, UK
- 2007 Evaluation of promotion to Reader, Imperial College, UK
- 2007 Recruitment at Senior Lecturer Level, Ben Gurion University of the Negev, Israel
- 2006 Evaluation of promotion to Associate Professor, McMaster University, Canada
- 2005 Evaluation of promotion to Associate Professor, University of California, San Diego
- 2004 Evaluation of promotion to Full Professor, University of Arizona, Tucson
- 2004 Evaluation of promotion to Senior Lecturer, University of Jerusalem, Israel
- 2000 Recruitment to Assistant Professor, University of Texas, Austin, USA

PROFESSIONAL SOCIETY MEMBERSHIPS

- American Association for the Advancement of Science (AAAS; elected fellow since 2022)
- Entomological Society of America (ESA; since 2022)
- German National Academy of Sciences (Leopoldina; elected member since 2021)
- Royal Society of Biology (I am an elected Fellow – FRSB – since 2009)
- The Linnean Society of London (I am an elected Fellow – FLS – since 2004)
- The Royal Entomological Society (I am an elected Fellow – FRES – since 2004)
- ASAB (Association for the Study of Animal Behaviour)
- Colour Group, Britain
- Associate, BBS (Behavioral and Brain Sciences)
- IUSI (International Union for the Study of Social Insects), Britain

POSTDOCTORAL FELLOWS

- Dr. Olga Dyakova (2024-present)
- Dr. Sarah Skeels (2024-present)
- Dr. Mai Morimoto (2022-2024; now postdoc, Imperial College, London)
- Dr. Jouni Takalo (2022-2023, now postdoc, University of Sheffield)
- Dr. Natacha Rossi (2019-2022, now postdoc, University of Sussex)
- Dr. Hadi Maboudi (2015-2018; now computer scientist at Opteran, Sheffield)
- Dr. Zhu Xing-Fu (2015-2016; now Professor, Xishuangbanna Tropical Botanical Garden (XTBG), Chinese Academy of Sciences)
- Dr. Olli Loukola (2015-2017; now Assistant Professor, University of Oulu)
- Dr. Joseph Woodgate (2014-2022)
- Dr. James Makinson (2014-2019; now Hawkesbury Institute for the Environment, Western Sydney University)
- Dr. Cwyn Solvi (2014-2021, now Professor, Southern Medical University, China)
- Dr. Vera Vasas (2013-2019, now postdoc, University of Sussex)
- Dr. Sylvain Alem (2013-2016; Research Project Manager at the Government Office for Science, UK)
- Dr. David Baracchi (2013-2015; now Professor, University of Florence (Firenze), Italy)
- Dr. Stephan Wolf (2013-2015)
- Dr. Aurore Avergues-Weber (2011-2012; now CRNS fellow, University of Toulouse)
- Dr. Vivek Nityananda (2010-2013; now postdoctoral fellow, Newcastle, UK)
- Dr. Mathieu Lihoreau (2009-2010; now CNRS fellow, Toulouse, France)
- Dr. Mathieu Molet (2007-2008; now Lecturer at the University of Paris)
- Dr. Tom Ings (2006-2009; now Senior Lecturer, Anglia Ruskin University, Cambridge, UK)
- Dr. Thomas Doering (2005-2009; now Full Professor, University of Bonn, Germany)
- Dr. Heather Whitney (2006-2009, co-supervised with Prof Beverley Glover, Cambridge); now Senior Research Fellow, University of Bristol
- Dr. Louise Cranmer (2005)
- Dr. Nigel E. Raine (2004-2009; now Professor and Rebanks Family Chair in Pollinator Conservation, University of Guelph, Canada)

- Dr. Adrian G. Dyer (2002; 2006; now QEII Research Fellow at Monash University, and Associate Professor at RMIT University, Australia)
- Dr. Johannes Spaethe (2002; now Privatdozent / Senior Lecturer, University of Wuerzburg)

PHD STUDENTS

- Maxime Janbon (2023-present)
- Chao Wen (visiting PhD student 2021-2022)
- Oluwaseun Sunday (visiting PhD student 2021-2022)
- Yonghe Zhou (2020-present)
- Matilda Gibbons (2019-2023)
- Vince Gallo (2017-2022)
- Joanna Brebner (2017-2021)
- Samadi Galpayage Dona (2017-2022)
- Alice Bridges (2017-2022)
- José Eric Romero González (2015-2019)
- Marie Guiraud (2015-2019)
- Cui Guan (2014-2018; now postdoctoral fellow, Aston University, UK)
- Li Li (2013-2017; now Associate Professor, Jiangnan University, China)
- Tristan Matthews (2013-2017; co-supervised with A. Cavallaro)
- Simon Emberton (2012-2016; co-supervised with A. Cavallaro; now Senior Lecturer, University of the West of England, Bristol)
- Mark Roper (2012-2016)
- Fei Peng (2012-2016; now Full Professor, Southern Medical University, China)
- Erika Dawson (2010-2014; now postdoc, Sorbonne, Paris, France)
- Kathryn Hunt (2009-2013)
- Friedrich Lenz (2009-2013; co-supervised with Dr Rainer Klages)
- Mu-Yun Wang (2009-2013; now postdoc, University of Tokyo)
- Samia Faruq (2008-2012; co-supervised with Prof Peter McOwan)
- Helene Muller (2007-2011)
- Ralph Stelzer (2006-2010)
- Sarah Arnold (2006-2010; now Senior Lecturer, Greenwich University)
- Ellouise Leadbeater (2004-2007; now Professor, Royal Holloway University of London)
- Tom Ings (2003-2006; now Senior Lecturer, Anglia Ruskin University, Cambridge)
- Nehal Saleh (2003-2006)
- Anna Dornhaus (1999-2002; now Full Professor, University of Arizona, Tucson)
- Johannes Spaethe (1998-2001; now Associate Professor (Privatdozent, University of Würzburg)

MSc STUDENTS

- Macy Guerri-Garrett (2024)
- Vidhi Ganpat Jain (2024)
- Vrushali Milind Dhotre (2024)
- Navin Ramnani (2024)
- Ella Brasher (2024)
- Ikaros Savva (2022)
- Stephan Balancy (2022)
- Elisa Pasquini (2021, Erasmus student)
- Yuyi Lu (2020-2021)
- Jennifer Law (2020)
- Dorothy Dunne (2020)
- Charlotte Lockwood (2020)
- Yuval Omer (2020)

- Kaarle Mäkelä (2020, Erasmus student)
- Amanda Royka (2019)
- Tara Wilson (2019-2020)
- Olga Procenko (2018)
- Jacqueline Bond (2018)
- Ana Cecilia Islas (2018)
- Hiruni Samadi Galpayage Dona (2016)
- Alice Marples (2015)
- Martina Zoli (2013, Erasmus student)
- Erika Dawson (2010)
- Ralph Stelzer (2005)
- Annette Schmidt (2002)
- Petra Frauenstein (2002)
- Juliette Schikora (2001)
- Kristina Stüber (2001)
- Anja Hickelsberger (2000)
- Steffen Schürkens (2000)
- Anna Dornhaus (1999)

Sabbatical Visitors Hosted

- Prof Tamar Keasar (University of Haifa, Israel; 2021)
- Prof Francesco Nazzi (University of Udine, Italy; 2019)
- Prof Blandina Viana (Universidade Federal da Bahia, Brazil; 2018-2019)
- Prof Angelo Bisazza (University of Padova, Italy; 2017)
- Prof Elizabeth Capaldi (Bucknell College, USA; 2016- 2017)
- Prof Caroline Nieberding (Université Catholique de Louvain, Belgium; 2016)
- Prof Gidi Ne'eman (University of Haifa, Israel; 2011-2012)

NAMED LECTURES

- 2024 Distinguished Visitor in Organismal Biology lecture, Cornell University, Ithaca, NY, USA
Gatsby Lecture, COSYNE Conference, Lisbon, Portugal
Alexander Lecture, University of Massachusetts - Amherst, USA
Leibniz Lecture, Leibniz Institute of Neurobiology (LIN), Magdeburg, Germany
- 2023 Hilldale and John T. Emlen Lecture, University of Wisconsin – Madison, USA
Von Frisch Lecture at the 50th Nobel Prize Anniversary in Ethology Colloquium (Vienna, Austria)
- 2022 George Knights Memorial Lecture BBKA Spring Convention, Harper Adams University, UK
- 2021 Distinguished Speaker Lecture, Science of Intelligence, TU Berlin, Germany
- 2020 Tinbergen Lecture, ASAB Winter Meeting, London, UK
Baerends Lecture, Netherlands Society for Behavioural Biology, Netherlands
- 2019 Whitehead Lecture, Goldsmiths, University of London, UK
NEUREka! Seminar, King's College, London, UK
- 2017 Heller Lecture, Hebrew University of Jerusalem, Israel
- 2016 Tupper Lecture, Smithsonian Tropical Institute, Panama City, Panama
- 2015 John Emlen Lectureship, University of Wisconsin, Madison, USA
- 2015 Celebrity Lecture, CIE and the International Year of Light, Manchester, UK
- 2011 Welcome Day Speaker, University of Trento, Italy
- 2009 Charles Darwin Lecture (200th Anniversary), University of Glasgow
- 2008 Verrall Lecture at the Royal Entomological Society (Imperial College, London)

2006 Distinguished Biologist Lecture, University of Arizona, Tucson, USA

SYMPOSIA ORGANISED

2022 XXVI International Congress of Entomology, Helsinki, Finland (Scientific organizing team for Section Ecology, Behaviour and Evolution)

2016 Behaviour Symposium at EurBee Conference, Cluj Napoca, Romania

2014 Neural Circuits Underpinning Insect Cognition: Queen Mary University of London

2007 IBRA International Conference (Finland); Symposium on non-Apis bees

2006 Eurbee Conference, Prague, Symposia on bee learning and physiology (co-hosted with M. Giurfa)

2005 IUSSI Winter meeting at Queen Mary, University of London

2004 CEE workshop on “The evolution of visual signals and receivers”, UCL, London, UK

2001 Plant-Insect Interactions, IUSSI Berlin, Germany

1999 Behavioral dimensions of pollinator service, International Botanical Congress, St. Louis, USA

INVITED SYMPOSIUM PRESENTATIONS

2024 European IUSSI Congress 2024, Lausanne, Switzerland (plenary lecture)

New York Declaration of Consciousness Meeting, NYU, New York, USA

Copernicus Festival, Krakow, Poland (plenary lecture)

Oxford Literature Festival, UK

Schirach-Imker-Convent, Bautzen, Germany

West Sussex Beekeepers Association Convention, Pulborough, UK

Chester County Beekeepers Association Annual Virtual Conference, USA

Decentring the Human Lecture Series, Queen Mary University of London, UK

2023 New Mexico Beekeepers Association Virtual Winter Conference, USA

Derbyshire Beekeepers' Association Pre-Season Annual Conference, UK

Insects as Mini-Livestock / Animal Welfare Research Network (UK; online lecture)

Middlesex Beekeepers' Day / Enfield and District Beekeepers' Association, London, UK

Gloucestershire Beekeepers' Association Spring Lecture Day, Cirencester, UK

Individualisation Symposium, University of Bielefeld, Germany (online)

Pari Center – Incredible Minds Lecture Series (online)

Animal Consciousness Conference, Dharamshala, India

Universities Federation for Animal Welfare (UFAW) conference; Keynote lecture (online)

EPRI Pollinator Power Party, USA and global (online)

Science Foo Camp, San Francisco, USA

Jahreskonferenz der AG für wesensgemaeße Bienenhaltung AGNI, Switzerland

3rd AsiaEvo Conference, Singapore (online)

2022 Annual Meeting of the Deutsche Zoologische Gesellschaft (DZG - Keynote lecture), Bonn, Germany

BBKA Spring Convention, Harper Adams University, UK (2 lectures)

IEEE International Conference on Development and Learning (ICDL), London UK (Keynote lecture)

Brain Awareness Week - University of Silesia and Jagiellonian University, Katowice, Poland (main lecture - online)

Comparative Neurobiology of Higher Cognitive Functions workshop, Erice, Italy

Leopoldina (German National Academy of Sciences) Induction Ceremony, main evening lecture (Halle, Germany)

Summer School on Consciousness and Metacognition, Paris, France

York Festival of Ideas, UK (online)

Scottish Beekeepers' Annual Convention, Kinross, UK (2 lectures)

- Weimarer Bienen-Symposium
 Sheffield Beekeeper Association
 Entomological Society of America (Symposium on Insect Welfare in Farmed, Wild, and Research Contexts) Vancouver, Canada
 Neurobiology of Changing Ecosystems - The Kavli Foundation, Los Angeles, USA
 Biological Basis of Behavior International Course, UNAM Morelia (online), Mexico
 Saskatchewan Beekeepers Annual General Meeting (online; keynote lecture), Canada
 Presidential Symposium, International Congress of Neuroethology, Lisbon, Portugal
- 2021 Interspecies Conversation Conference (online), symposium chaired by musician Peter Gabriel
 Invertebrate Animal Sentience Webinar conference (online)
- 2020 Society for Integrative and Comparative Biology, Austin, Texas, USA
- 2019 EUREKA Symposium, University of Würzburg, Germany
 Animal Consciousness Symposium, ISHPSSB, Oslo, Norway
 CogEvo 2019, Workshop on Cognition and Evolution, Rovereto, Italy
 Annual Meeting of the Ethologische Gesellschaft, Hannover, Germany (opening plenary lecture)
- 2018 The Other Minds Problem conference, Montreal, Canada
 Varieties of Mind Conference, Cambridge, UK
 Symposium to commemorate the 10th anniversary of the Psychology Dept at QMUL, London, UK
 Cognition symposium, HHMI Janelia Farm, USA
 Berliner Bienenkonferenz, French Embassy, Berlin, Germany
- 2017 Royal Society ‘Origins of numerical abilities’ London, UK
 BOMBUSS Conference, Logan, Utah, USA (plenary speaker)
 Origins of Consciousness, London School of Economics, UK
 Rational Animals, Van Leer Institute, Jerusalem, Israel
 The Thinking Animal, University of Lund, Sweden
 Entomological Networks: Ecology, Behaviour and Evolution, Newcastle, UK (plenary speaker)
 IUSSI Conference, York, UK (plenary speaker)
- 2016 The role of sensory ecology and cognition in social decisions Workshop, Arolla, Switzerland
 Plenary lecture: Behaviour Adaptations Conference, Toulouse, France
 HFSP Symposium, Aspet, France
 Interdisciplinary College, Günne, Germany
 Plenary Lecture: Annual Meeting of the Ethological Society, University of Goettingen, Germany
- 2015 Annual Sideer Graduate Symposium, Ben Gurion University, Israel
 (Opening lecture, plenary evening lecture, and workshop)
 BVI Young Researchers Colloquium, keynote lecture, Bristol, UK
 Convergent Minds Conference, University of Boston, USA
 Microbrain Conference, University of Washington, Seattle, USA
 IDEEV, Gif-sur-Yvette (annual conference, plenary evening lecture), France
 Organisation for Computational Neuroscience, Prague, Czech Republic
- 2014 President’s Symposium, Animal Behavior Society, Princeton, USA
 Janelia Farm Insect Learning and Memory Conference, USA
 Colour Group (GB) Awards Meeting, London, UK
- 2013 IUSSI French section, Paris – Villetaneuse, France (plenary speaker)
 ESCON Experts Meeting (Distributed Cognition), Lisbon, Portugal
 ‘Intelligent Sensing’ Summer School, London, UK

- Symposium of the International Max Planck Research School, Seewiesen (keynote speaker)
 BBSRC Animal Welfare Workshop, Birmingham, UK
- 2012 Centre for Behaviour and Evolution Annual Conference, Newcastle (plenary speaker)
 14th International Behavioral Ecology Congress, Lund, Sweden (plenary speaker)
 Royal Society discussion meeting; The Future of Comparative Cognition, London, UK
 Eurbee Conference, Halle Germany (plenary speaker)
- 2011 International Symposium on Communication in Social Insects (Taipei, Taiwan)
 Physical Cognition and Problem Solving, Birmingham, UK
 Gordon Research Conference (Neuroethology), Stone Hill College, USA
- 2010 IUSSI, Copenhagen (Keynote speaker)
 Evolution of Cognition symposium, Ann Arbor, Michigan, USA
 Social cognition symposium, Birkbeck, London
- 2009 Biology of Decision Making, Bordeaux, France
 Insect Learning and Memory, Roscoff, France
- 2008 Royal Entomological Society Pollination Meeting (Harpenden UK)
 Gatsby Symposium, Simpler Cognitive Systems (London, UK)
 Benelux Congress of Zoology, Liège, Belgium (Keynote speaker)
 Evolutionary Ecology of Plant-Animal Interactions (Palma de Mallorca, Spain)
 Royal Entomological Society (Rothamsted; Keynote speaker)
- 2007 Colour Design & Engineering (Linnean Soc and IMechE, London)
 Visual Processing in Insects (HHMI Janelia Farm Research Campus, USA)
 Royal Entomological Society (Newcastle, UK)
- 2006 Eurbee Conference, Prague (invited talks at 2 symposia, one as plenary speaker)
 FENS (Forum for European Neuroscience, Vienna, Austria)
 London Evolutionary Research Network (Plenary Speaker)
 Animal Behaviour Society Winter Meeting (Keynote Lecture)
- 2004 Royal Entomological Society, Pollination Meeting, London
 Island Biogeography Conference, Aarhus, Denmark
 International Conference of the Society of Population Biology, Tsukuba, Japan (Keynote lecture)
- 2003 Evolvability and Interaction Symposium, London, UK (Keynote lecture)
 Meeting of the Netherlands Society of Behavioural Biology (Keynote lecture)
 Symposium on Conservation and biology of bumble bees; Zoological Society of London
 Symposium on Colour Vision, College of Ophthalmology, London
 Central Association of Beekeepers, Spring Conference, Imperial College, London
- 2002 European Meeting of IBRA, Cardiff, UK
- 2001 Symposium on Colour Vision, College of Ophthalmology, London
- 1999 Symposium on Sensory Ecology, Austrian Academy of Sciences
- 1998 Göttingen Neurobiology Conference, Symposium on Sensory Ecology
- 1996 Symposium: Rules of Spatial Memory Organisation, Berlin-Brandenburg Academy of Sciences.
 Meetings of the Society for the Study of Evolution, St. Louis, Missouri, USA
- 1995 International Congress of Neuroethology (Cambridge, UK)
- 1993 Sprengel Symposium (Berlin-Spandau, Germany)
- 1992 Symposium on the perception of ultraviolet light at the Annual meeting of the American Society of Zoologists (Vancouver, Canada).

OTHER INVITED SEMINARS

- 2024 Opening Speech at *Nature the Artist* “The Colony” Exhibition, Kings Cross, London, UK
 CIMEC Center for Mind / Brain Sciences, Trento, Italy (online)
 Westerham Beekeepers Association, Kent, UK
 Cuautitlán Faculty of Higher Studies of the UNAM, 50th anniversary celebration, Mexico
 Bishops Stortford Beekeepers, UK
 West Suffolk Beekeepers’ Association, Bury St. Edmunds, UK
 Inn on Boltwood, public lecture, Amherst, Massachusetts, USA
 Arizona State University, course on “Writing about science for a general audience” USA (online)
 Katholische Erwachsenenbildung Main-Taunus, Germany (online)
 Deutsches Krebsforschungszentrum, Heidelberger Life Science Lab, Germany (online)
 Maine State Beekeepers Association, USA (online)
- 2023 UNAM Morelia, Mexico
 UNAM Juriquilla/Queretaro, Mexico
 Department of Life Sciences, Imperial College, London, UK
 Dunwoody Beekeepers, Georgia, USA (online)
 London Beekeepers’ Association (LBKA), UK (online)
 University of Wageningen, Netherlands
 Belhaven University, Jackson, Mississippi, USA (online)
 Central Maryland Beekeepers Association, USA (online)
 Free the Bees, Switzerland / international (online)
 Nottinghamshire Beekeepers’ Association (NBKA, online)
 University College London (UCL) CDB Seminar, London, UK
 University of Lund, Sweden
 University of Toulouse, France
 Sorbonne University / Paris Nord, Paris, France
 Backyard Beekeepers, Connecticut, USA
 University of Arizona (Tucson), Cognitive Science Seminar Series (online), USA
 Harvard University, Quantitative Ethology Seminar (online), USA
 University College London, Social Neuroscience lecture series, London, UK
 Insect Welfare Research Society (online), USA and international
 Interspecies Internet Lecture Series (online), UK and international
 Volkshochschulen Deutschland, Wissensreihe vhs.wissen live (online), Germany
 RSPCA Lay Members Forum, London, UK
- 2022 Instituto de Investigaciones Biomedicas, UNAM, Mexico City, Mexico
 King’s College, London, UK
 BeeCraft lecture (jointly with Somerset Beekeepers), UK (online)
 CINVESTAV, Departamento de Fisiología, Biofísica y Neurociencias, Mexico City, Mexico
 Israel Institute of Advanced Study, Jerusalem, Israel
 Cambridge Beekeepers’ Association, UK (online)
 University of Cincinnati, USA
 Arboreal Apiculture Salon, USA and international (online)
 Massachusetts Bee Club, USA (online)
 UC Santa Barbara (GRT Study Group) USA (online)
 Spirit of the Senses Salon, Phoenix, AZ, USA (online)
 Barts Cancer Institute, London, UK
 Hastings and Rother Beekeepers winter meeting, UK (online)
 North London Beekeeper’s winter meeting, UK (online)
 Hampstead Scientific Society, London, UK

- 2021 Royal Philosophical Society of Glasgow, UK (online)
University of Cambridge, UK
University of Groningen, Netherlands (online)
Champalimaud Centre for the Unknown, Portugal, Lisbon
- 2020 Somerset Beekeepers Association, UK
University of Bedfordshire, UK (online)
- 2019 Science Society at Magdalene College, Cambridge, UK
- 2018 UNAM-Institute of Ecology-Mexico City, Mexico
Wissenschaftskolleg zu Berlin / Institute of Advanced Study, Germany
University of Cork, Ireland
University of Reading, UK
University of St Andrews, UK
Friedrich-Loeffler-Institut, Celle, Germany
- 2017 University of Oxford, UK
Wissenschaftskolleg zu Berlin / Institute of Advanced Study, Germany
University of Sussex, UK
London School of Economics, UK
University of Haifa – Oranim, Israel
Barts Cancer Institute, London, UK
Canterbury Beekeepers, Canterbury, UK
- 2016 Smithsonian Tropical Institute, Panama City, Panama
University of Cambridge, UK
University of Bristol, UK
- 2015 University College London (cross-departmental Vision@UCL seminar series), UK
Brunel University, London, UK
University of Leeds, UK
- 2014 Royal Holloway University of London, UK
University College, London, UK
Rothamsted Research, Harpenden, UK
Champalimaud Centre, Lisbon ('Nano Course' – 3h Lecture for PhD students)
Champalimaud Centre, Lisbon ('SeminAR' – Public Lecture)
Champalimaud Centre, Lisbon (Research talk)
- 2013 University of Würzburg, Germany
University of Düsseldorf, Germany
University of Edinburgh, UK
Imperial College, London, UK
- 2012 University of Sussex, UK
Keele University, UK
Universität Zürich, Switzerland
- 2011 National Tsing Hua University, Taiwan
University of Toulouse, France
University of Lausanne, Switzerland
Imperial College, London, UK
- 2010 University of Freiburg, Germany
University of Lyon, France
Royal London Hospital, UK
- 2009 University of Vienna, Austria
University of St. Andrews, UK

University of Copenhagen, Denmark
 William Harvey Research Institute, London
 2008 Central Association of Beekeepers, London
 University of Manchester, UK
 University of Lausanne, Switzerland
 University of Bern, Switzerland
 Trinity College, Dublin, Ireland
 Institute of Biology, London, UK
 2007 Bromley Beekeepers, London, UK
 National Science & Engineering Week (Queen Mary, UK)
 National Science & Engineering Week (London Zoo, UK)
 University of Tours, France
 2006 University of Frankfurt, Germany
 Imperial College Silwood Park, London, UK
 University of Würzburg, Germany
 2005 University of Oxford, UK
 University of Bremen, Germany
 Free University of Berlin, Germany
 2004 Royal Holloway College (Dept. of Psychology), London, UK
 University of Northampton, UK
 University of Newcastle, UK
 2003 IACR Rothamsted, Harpenden, UK
 University of Cambridge, UK
 University of Bristol, UK
 City University, London, UK
 University of Sheffield, UK
 University of Toulouse, France
 University of Toronto, Canada
 University of Tsukuba, Japan
 University of Yokohama, Japan
 2002 Universität Hamburg, Germany
 2001 University of Sussex, UK
 Konrad-Lorenz Institute for Comparative Behavioral Research, Vienna, Austria
 Queen Mary and Westfield College, London, UK
 University College, London, UK
 2000 University of Vienna, Austria
 Universität Göttingen, Germany
 Naturwissenschaftlicher Verein, Würzburg, Germany
 1999 Universität Bonn, Germany
 1998 University of Erlangen, Germany
 ETH Zürich, Switzerland
 Free University of Berlin
 1997 University of Tulsa, Oklahoma, USA
 Washington DC, National Zoo, USA
 QM College, University of London, UK
 1996 Universität Würzburg, Germany
 QM College, University of London, UK
 University of Bristol, UK

- University of Cambridge, UK
- University of Oxford, UK
- Yale University, USA
- 1994 University of Maryland, Baltimore, USA
- University of Massachusetts, Boston, USA
- University of California, Santa Barbara, USA
- 1993 New York University, USA
- Universität Freiburg, Germany
- Universität Regensburg, Germany
- 1991 Universität Bonn, Germany
- University of Sao Paulo, Brazil

TEACHING EXPERIENCE

At Queen Mary, University of London

- 2002 – present Module Organiser for 1st year *Evolution* and 3rd year *Behavioural Ecology*
- Lectures & Practicals in *Evolution* (1st year)
- Tutorials in *Essential Skills for Biologists* (1st year)
- Lectures & Practicals in *Decoding DNA* (2nd year)
- Lectures & Practicals in *Animal Physiology* (2nd year)
- Lectures & Practicals in *Genes & Bioinformatics* (2nd year)
- Lectures & Practicals in *The Invertebrates* (2nd year)
- Lectures in *Evolutionary Genetics* (2nd year)
- Tutorials in *Integrative Studies in Biology* (2nd and 3rd year)
- Lectures & Practicals in *Behavioural Ecology* (3rd year)
- Lectures in *Neuroscience* (3rd year)
- Lectures and Practicals in *Comparative Psychology* (2nd year)

At Würzburg University

- 1997 – 2002 Lectures in Animal Physiology for undergraduates (3rd year)
- Lectures in Animal Behaviour (2nd year psychology students)
- Tutorials in Arthropod Behaviour (4th and 5th year)
- Tutorials in Bee Biology (4th and 5th year)
- Practicals in Physiology, Neurobiology and Behavioral ecology (2nd, 3rd and 4th year)

1997 Workshop: Frontiers in Biology - University of Tulsa, Oklahoma

At the Free University of Berlin:

- 1991 - 1993 Foraging strategies of insects on plants (4th year)
- Insect orientation (4th year)
- BASIC programming (3rd year)

EXTERNAL REFEREE FOR JOURNALS AND PUBLISHERS

American Naturalist; Animal Behaviour; Animal Cognition; Annales de la Société Entomologique de France; Annals of Botany; Apidologie; Behavioral & Brain Sciences; Behavioral Ecology; Behavioral Ecology and Sociobiology; Biological Cybernetics; Biotropica; Biology Letters; Botanica Acta; Brain, Behaviour and Evolution; Canadian Entomologist; Current Biology; Ecography; Ecology; Ecology Letters; Ecological Entomology; Ecological Monographs; Entomologia Experimentalis et Applicata; Entomologia generalis; Ethology; Ethology, Ecology & Evolution; Heredity; Insectes Sociaux; International Journal of Comparative Psychology; International Journal of Psychology and

Psychoanalysis; Israel Journal of Plant Sciences; Journal of Biosciences; Journal of Comparative Physiology; Journal of Experimental Biology; Journal of Insect Behavior; Journal of Insect Physiology; Journal of Pollination Ecology; Journal of Theoretical Biology; Myrmecological News; Nature; Nature Communications; Naturwissenschaften; Oecologia; Oikos; Oxford University Press; Perspectives in Plant Ecology, Evolution and Systematics; Physiological Entomology; Physiology & Behavior; Planta; Plant Biology; Plant Systematics and Evolution; PLoS Biology; PLoS One, Proceedings of the National Academy of Sciences; Proceedings of the Royal Society; Psyche; Psychological Science; Quarterly Review of Biology; Science; Trends in Ecology and Evolution; Vision Research

EXTERNAL REFEREE FOR FUNDING AGENCIES

Agence Nationale de Recherche (ANR), France

Alfred P. Sloan Foundation, USA

Biotechnology & Biological Sciences Research Council (BBSRC), UK

Binational Agricultural Research and Development Fund, United States – Israel

Binational Science Foundation, United States – Israel

British Ecological Society

Deutscher Akademischer Austauschdienst (DAAD, Germany)

Deutsche Forschungsgemeinschaft (DFG, Germany)

European Research Council (ERC, Belgium)

Fonds zur Förderung der wissenschaftlichen Forschung (FWF, Vienna, Austria)

Human Frontiers Science Program

Israel Science Foundation

Leverhulme Trust (UK)

MacArthur Fellows Program (USA)

National Science Foundation (NSF) USA

Nature and Environment Research Council (NERC), UK

Science Foundation Ireland

The Academy of Sciences for the Developing World (TWAS), Italy

CONSULTING REPORTS

- For **Nutopia Limited** / National Geographic Channel (2020), Filming bee larval development
- for **Ginegar Smart Cover Solutions** (2017), Effects of optical properties of greenhouse covers on bee foraging
- for **BASF** (2005), on effects of UV-protective covering for commercial greenhouses, and effects on crop pollination
- for **Central Networks / E.ON** (2004) on the colour scheme of outdoors work wear, to avoid insect attacks
- for **Koppert Biological Systems** (2004), on methods to improve greenhouse pollination of tomato plants by bumblebees