
ALEX JORDAN - SCIENCE CV

PROFILE

Alex Jordan's research group uses quantitative approaches to study the evolution and adaptive value of animal behaviour in natural contexts. Alex is interested in how behaviour has evolved, what the adaptive value of behaviour is, and what the mechanisms that underlie behaviour are.

Jordan borrows computational approaches developed for model laboratory systems like *Drosophila* and Zebrafish, and employs them in settings where animal behaviour has evolved - Lake Tanganyika, the Mediterranean Sea, coral reefs, and tropical rainforests. Using techniques like computer vision and machine learning, automated tracking of behaviour, and 3D reconstruction of environments, he aims for a quantitative assessment of the expression and value of behaviour in the places it naturally occurs.

Using many different taxa, Jordan seeks to understand how social interactions are modified by current context, how animals perceive and process social cues, and how environments - both social and physical - change and are changed by behaviour. He takes a broad approach, combining studies of proximate neurobiological and genetic mechanisms, with analyses of the physics of interactions, up to broad evolutionary and ecological studies of social influence and behaviour.

EMPLOYMENT

MPIAB RESEARCH GROUP LEADER (TENURED) – 2020-PRESENT

Max Planck Institute of Animal Behavior, Konstanz

GROUP LEADER – 2016-2019

Department of Collective Behaviour, Max Planck Institute of Animal Behavior, Konstanz

DEPARTMENTAL FELLOW IN INTEGRATIVE BIOLOGY – 2013-2015

Department of Integrative Biology, The University of Texas at Austin.

JSPS POSTDOCTORAL FELLOW – 2012-2013

Lake Tanganyika Research Station, Mpulungu, and Osaka City University

EDUCATION

PHD IN EVOLUTIONARY BIOLOGY – 2011

University of New South Wales, Sydney, Australia. Thesis: Social environment and the evolution of male reproductive strategy. Advisors: Professor Robert Brooks and Associate Professor Ashley Ward

BACHELOR OF SCIENCE (HONOURS CLASS I) – 2007

University of Sydney, Australia. Thesis: Reproductive biology of South African honeybees. Advisors: Professor Madeleine Beekman and Professor Ben Oldroyd

SERVICE

Editorial board *The American Naturalist* – 2017-2021

Editorial board *Movement Ecology* – 2018-2021

Reviewer: *Science*, *PNAS*, *PLOS Biology*, *Proceedings B*, *Evolution*, *Biology Letters*, *The American Naturalist*, *J Evolutionary Biology*, *Animal Behaviour*, *Behavioural Ecology*, *Behavioural Ecology and Sociobiology*, *Oikos*, *Behaviour*, *J Experimental Zoology*, *Ethology*, *Journal of Neuroscience*

PUBLICATIONS

Haluts A, Jordan A, Gov N. 2023. Modeling animal contests based on spatio-temporal dynamics. *Journal of the Royal Society Interface*. In press

Bose APH, Dabernig-Heinz J, Oberkofler J, Koch L, Grimm J, Sefc KM, Jordan A. 2022. Aggression and spatial positioning of kin and non-kin fish in social groups. *Behavioural Ecology*. In press

Röbber DC, Kim K, De Agrò M, Jordan A, Galizia CG, Shamble PS. 2022. Regularly occurring bouts of retinal movements suggest a REM sleep-like state in jumping spiders. *Proceedings of the National Academy of Sciences* 119 (33) e2204754119

Kohda M, Sogawa S, Jordan A, Kubo N, Awata S, Sato S, Kobayashi T, Fujita A, Bshary R. 2022. Further evidence for the capacity for mirror self-recognition in cleaner fish, and the significance of ecologically relevant marks. *PLOS Biology* February 17, 2022 <https://doi.org/10.1371/journal.pbio.3001529>

Rodriguez-Santiago M, Jordan A, Hofmann HA. 2022. Neural activity patterns differ between learning contexts in a social fish. *Proceedings of the Royal Society B*. 04 May 2022 <https://doi.org/10.1098/rspb.2022.0135>

Wegner AM, SUPERFLEX, Jordan A. 2022. Fish Architecture - A framework to create Interspecies Spaces. Published by BCS Learning and Development Ltd. *Proceedings of POM* Berlin 2021

Bose APH, Dabernig-Heinz J, Koch L, Grimm J, Lang S, Hegedüs B, Banda T, Makasa L, Jordan A, Sefc KM. 2022. Parentage analysis across age cohorts reveals sex differences

in reproductive skew in a group-living cichlid fish, *Neolamprologus multifasciatus*.

Molecular Ecology 16 February 2022 <https://doi.org/10.1111/mec.16401>

Bose APH, Dabernig-Heinz J, Koch L, Grimm J, Sefc KM, Jordan A. 2022. Patterns of sex-biased dispersal are consistent with social and ecological constraints in a group-living cichlid fish. *BMC Ecology and Evolution* 22, Article number: 21 (2022)

Gall GEC, Pereira TD, Jordan A, Meroz Y. 2022. Fast estimation of plant growth dynamics using deep neural networks *Plant Methods* 18:21 <https://doi.org/10.1186/s13007-022-00851-9>

Cakmak E, Buchmüller J, Jordan A, Keim D. Collective Movement Explorer: a web tool for the visual exploration of spatio-temporal collective animal behavior. *ACM SIGSPATIAL HANIMOB'21*

Haluts A, Garza-Reyes S, Gorbonos D, Jordan A**, Gov N**. 2021. Dynamics on the web: spiders use physical rules to solve complex tasks in mate search and competition. *Proceedings of the National Academy of Sciences* December 7, 2021 118 (49) e2106269118. **corresponding authors

Bose APH, Nührenberg P, Jordan A. 2021. Female-female conflict is higher during periods of parental care in a group-living cichlid fish. *Animal Behaviour* Volume 182, December 2021, Pages 91-105 *Editor's Choice December 2021

Bolnick DI, Fox JW, Débarre F, Dietrich EI, Phelps SM, Jordan A. 2021. Editorial expression of concern. *The American Naturalist*. Volume 198, Number 2

Goverts Z, Nuehrenberg P, Jordan A. 2021. Environmental reconstruction and tracking as methods to explore social interactions in marine environments: a test case with the Mediterranean Rainbow Wrasse *Coris julis*. *Frontiers in Marine Science*. <https://doi.org/10.3389/fmars.2021.695100>

Maguire SM, DeAngelis R, Dijkstra PD, Jordan A, Hofmann HA. 2021. Social network dynamics predict hormone levels and behavior in a highly social cichlid fish. *Hormones and Behavior* Volume 132, June 2021, 104994

Lein E, Jordan A. 2021. Studying the evolution of social behaviour in one of Darwin's Dreamponds - a case for the Lamprologine shell-dwelling cichlids *Hydrobiologia* (2021). <https://doi.org/10.1007/s10750-020-04473-x>

Jungwirth A, Nührenberg P, Jordan A. 2021. On the importance of defendable resources for social evolution: applying new techniques to a long-standing question. *Ethology*. Volume 127, Issue 10. Special Issue: The Evolution of Social Behaviour.

Gübel J, Bose APH, Jordan A. 2021. Social and spatial conflict, but not resource abundance, drive responses of residents towards joiners in a group-living fish. *Behavioural Ecology*. arab045, <https://doi.org/10.1093/beheco/arab045> Published: 25 May 2021

Etheredge RI, Scharl M, Jordan A. 2021. Decontextualized learning for interpretable hierarchical representations of visual patterns. *Patterns* 287: 20202172.

Zhao J, Wen Y, Zhu S, Ye J, Zhu J, Ye Z, Jordan A. 2020. A novel solution to the trade-off between feeding and predator avoidance: regurgitation and expulsion of ingested food in the face of threat. *Proceedings of the Royal Society B* 287: 20202172

Rodriguez-Santiago M, Nuehrenberg P, Derry J, Deussen O, Francisco F, Garrison LK, Garza SF, Hofmann A, Jordan A. 2020. Behavioral traits that define social dominance

are the same that reduce social influence in a consensus task. *Proceedings of the National Academy of Sciences* 117 (31) 18566-18573

Windorfer J, Bose A, Böhm A, Ronco F, Indermaur A, Salzburger W, Jordan A. 2020. Manipulating structural attributes of shelters reveals hidden, open-ended preference functions in a niche-constructing cichlid fish. *Proceedings of the Royal Society B*. Volume 287 Issue 1927.

Jordan A, Taborsky B, Taborsky M. 2020. Cichlids as a model system for studying social behaviour and evolution. In '*The Behaviour, Ecology, and Evolution of cichlid fishes: A Contemporary Modern Synthesis*' Abate and Noakes (eds). Springer Academic.

Francisco F, Nührenberg P, Jordan A. 2020. High-resolution animal tracking with integration of environmental information in aquatic systems *Movement Ecology*. 8:27. <https://doi.org/10.1101/571232>

Garkov D, Sommer B, Dullin C, Jordan A, Klein K, Lein E, Schreiber F. 2020. Towards an Immersive Analytics Application for Anatomical Fish Brain Data. *ISMB BioVis*

Cakmak E, Schaefer H, Buchmuller J, Fuchs J, Schreck T, Jordan A, Keim D. 2020. MotionGlyphs: Visual Abstraction of Spatio-Temporal Networks in Collective Animal Behavior. *EuroVis20* Volume 39 (2020) Number 3

Kohda M, Hotta T, Takeyama T, Yoshimura N, Jordan A. 2019. If a fish can pass the mark test, what are the implications for consciousness and self-awareness testing in animals? *PLOS Biology* 17(2) <https://doi.org/10.1371/journal.pbio.3000021>

Satoh S, Awata S, Tanaka H, Jordan A, Kakuda, Hori, & Kohda M. 2019. Bi-parental mucus provisioning in the scale-eating cichlid *Perissodus microlepis* (Cichlidae). *Biological Journal of the Linnean Society*, 128(4), 926-935

Beekman M, Jordan LA. 2017. Does the field of animal personality provide any new insights for behavioural ecology?. *Behavioural Ecology* (2017) 28 (3): 617-623. DOI: <https://doi.org/10.1093/beheco/axx022>.

Jordan LA, Maguire S, Hofmann, HA, Kohda M. 2016. The social and ecological consequences of an 'over-extended' phenotype. *Proceedings of the Royal Society B* 283 (1822)

Bolnick DI, Hendrix K, Jordan LA, Veen T, Brock CD. 2016 Intruder colour and light environment jointly determine how nesting male stickleback respond to simulated territorial intrusions. *Biology Letters*. 12: 20160467

Ryan MJ, Jordan LA. 2016. Courtship and Mate Choice, In J Call (Ed) *APA Handbook of Comparative Psychology*

Jordan LA, Ryan MJ. 2015. The sensory ecology of adaptive landscapes. *Biology Letters* <http://dx.doi.org/10.1098/rsbl.2014.1054>

Kohda M, Jordan LA, Kosaka N, Hotta T, Takeyama TT. 2015. Facial recognition in a group-living cichlid. *PLoS ONE* 10 (11): e0142552. <https://doi.org/10.1371/journal.pone.0142552>

Takashi H, Jordan LA, Takeyama T, Kohda M. 2015. Order effects in transitive inference: Does the presentation order of social information affect transitive inference in social animals? *Frontiers in Ecology and Evolution* <http://dx.doi.org/10.3389/fevo.2015.00059>

Hotta T, Takeyama T, Heg D, Awata S, Jordan LA, Kohda M. 2015. The use of multiple sources of social information in contest behaviour: testing the social cognitive abilities of a cichlid fish. *Frontiers in Ecology and Evolution* doi: 10.3389/fevo.2015.00085

Brooks RC, Shelly JP, Jordan LA, Dixson BJ. 2015. The multivariate evolution of female body shape in an artificial digital ecosystem. *Evolution and Human Behavior* Volume 36, Issue 5; 351-358

Jordan LA, Kokko H, Kasumovic MM. 2014. Reproductive foragers: Spider males choose mates by selecting among available competitive environments. *The American Naturalist* 183 (5): 638-649 *Presidents Award, Best Paper of the Year

Li N, Takeyama T, Jordan LA, Kohda M. 2014. Female control of paternity by spawning site choice in a cooperatively polyandrous cichlid. *Behaviour* doi 10.1163/1568539X-00003242

Takashi H, Takeyama T, Jordan LA, Kohda M. 2014. Duration of memory of dominance relationships in a group living cichlid. *Naturwissenschaften* 101(11): 533-541

Jordan LA, Herbert-Read, Ward A. 2013. Rising costs of alloparental care make spiny chromis discerning parents. *Behavioural Ecology and Sociobiology* doi 10.1007/s00265-012-1465-6.

Kasumovic MM, Jordan LA. 2013. The social factors driving settlement and relocation decisions in a solitary and aggregative spider. *The American Naturalist* 182 (4): 532-541

Mann RP, Herbert-Read JE, Ma Q, Jordan LA, Sumpter DJT, Ward AJW. 2013. A model comparison reveals dynamic social information drives the movements of humbug damselfish. *Journal of the Royal Society Interface* 11 (90) doi: 10.1098/rsif.2013.0794

Ward AJW, Herbert-Read JE, Jordan LA, James R, Krause J, Ma Q, Rubenstein DI, Sumpter DJT & LJ Morrell. 2013. Initiators, leaders and recruitment mechanisms in the collective movements of damselfish. *The American Naturalist* 181 (6):748-760.

Jordan LA, Brooks R. 2012. Recent social history alters male courtship preferences. *Evolution* 66(1): 280-287

Wong MYL, Jordan LA, Marsh-Rollo S, St-Cyr S, Reynolds J, Stiver K, Desjardins J, Fitzpatrick JL, Balshine S. 2012. Mating systems in cooperative breeders: the roles of resource dispersion and conflict mitigation. *Behavioral Ecology* doi: 10.1093/beheco/arr218

Jordan LA, Brooks R. 2010. The lifetime costs of increased male reproductive effort: Courtship, copulation, and the Coolidge Effect. *Journal of Evolutionary Biology* 23(11): 2403-2409

Jordan LA, Avolio C, Herbert-Read JE, Krause J, Rubenstein D, Ward A. 2010. Group structure in a restricted entry system is mediated by both resident and joiner preferences. *Behavioural Ecology and Sociobiology* 64(7): 1099-1117

Jordan LA, Wong MYL, Balshine S. 2010. The effects of familiarity and social hierarchy on group membership decisions in a social fish. *Biology Letters* 6(3): 301-303

Beekman M, Allsopp MH, Jordan LA, Lim J, Oldroyd BP. 2009. A quantitative study of worker reproduction in queenright colonies of the Cape honey bee, *Apis mellifera capensis* *Molecular Ecology* 18: 2722-2727

Jordan LA, Allsopp MH, Oldroyd BP, Wossler TH, Beekman M. 2008. Cheating honeybee workers produce royal offspring. *Proceedings of the Royal Society B*: 275(1632): 345-351

Jordan LA, Allsopp MH, Beekman M, Wossler TH, Oldroyd BP 2008. Inheritance of traits associated with reproductive potential in *Apis mellifera capensis* and *A. m. scutellata* workers. *Journal of Heredity* 99(4): 376-381

Oldroyd BP, Allsopp MH, Gloag RS, Lim J, Jordan LA, Beekman M. 2008. Thelytokous parthenogenesis in unmated queen honey bees (*Apis mellifera capensis*): Central fusion and high recombination rates. *Genetics* 180:359-355

Jordan LA. CABI, 2008. *Poecilia reticulata*. In: *Invasive Species Compendium*, 2008 edition. Wallingford, UK: CABI

Jordan LA, Allsopp MH, Oldroyd BP, Wossler TH, Beekman M. 2008. A scientific note on the drone flight time of *Apis mellifera capensis* and *A. m. scutellata*. *Apidologie* 38(5): 436-437

Midgley DJ, Jordan LA, Saleeba J, McGee P. 2006. Utilisation of carbon substrates by orchid and ericoid mycorrhizal fungi from Australian dry sclerophyll forests. *Mycorrhiza* 16(3): 175-182

FUNDING

Human Frontiers Science Program Young Investigators' Grant. Together with Yasmine Meroz and Orit Peleg, this project examines the transmission of influence in social groups - € 450 000

Centre for the Advanced Study of Collective Behaviour Large Grant - € 271 000

Humboldt Foundation Renewed Research Stay Grant for sabbatical visitor Alex Baugh - € 12 000

TBA21 Research Grant. PhD salary and costs for project "The interaction between social and structural networks in coral reef fish communities" - € 104 000

Centre for the Advanced Study of Collective Behaviour Medium Grant for postdoctoral salary Aneesh Bose - € 80 000

Humboldt Foundation Postdoctoral Research grant to Dr Aneesh Bose - € 160 000

DFG Excellence Cluster "Centre for the Advanced Study of Collective Behaviour". PhD position plus project costs - € 180 000 (of total € 32 000 000 awarded to Cluster)

Heineman Research Grant, Minerva Foundation. For Project "How are cooperation and collective behaviour maintained as conflict increases? A study of the price of anarchy and conflict across social systems" - € 234 000

University of Konstanz Transdepartmental Teaching Award for course Quantitative Marine Biology, a field course of my own design and instruction - € 6 900

NSF BEACON Center for Evolution in Action Research Grant. I conceived, wrote, and am leading the research for this NSF funded grant as Principal Investigator in collaboration with Dr Hans Hofmann and Dr Chris Adami - \$109,575

Thyssen-Bornemisza Academy Grant-in-aid. Full use and board of vessel 'The Dardanella' for three-week research program on coral reefs in the Pacific Ocean - € 75 000

ELETTRA SYRMEP Beamline Grant-in-aid. Award of beamtime in recognition of the excellence of your proposal and is an in-kind contribution funded by public (national and EU) sources within the Open Access rules applied in Europe - € 4500

MPI Research Group Grant for project "Evolution of social and collective behavior in fishes" - € 70 000 (each year for period 2016-2020)

Presidential Award for best paper appearing in The American Naturalist - \$1000

Ecolabs Texas Research Grant for work on learning in invasive fish species - \$7895

Don Abbott Postdoctoral Research Award for an outstanding contributed presentation by a current postdoc - Runner-up American Society of Naturalists conference, Asilomar.

Integrative Biology Postdoctoral Fellowship, University of Texas at Austin - \$80,000

Integrative Biology Research Grant, University of Texas at Austin - \$12,000

Japanese Society for the Promotion of Science Research Grant - \$12,000

Japanese Society for the Promotion of Science Postdoctoral Fellowship - \$100,000

Crispin Rice Prize for Outreach and Communication in Evolution and Ecology - \$1000

EERC Writing and Skills Transfer Award, University of NSW - \$6000

Fulbright People's Choice Award - Australia and Oceania 3MT Competition - \$5000

UNSW Faculty of Science Excellence in Postgraduate Research - \$3000

University of NSW Three-Minute Thesis Competition - \$1000

Outstanding Evolution & Ecology Researcher of the Year (Postgraduate) - \$500

Best Presentation, Evolution and Ecology Research Centre Research Forum - \$100

UNSW SPSS Travel Grant for conference attendance - \$3000

Research Travel Grant to South Africa, University of Sydney - \$1500

Top-up Scholarship, The University of NSW - \$17,500

Australian Postgraduate Award, Australian Department of Science - \$70,000

SUPERVISION

Postdoctoral Fellows (4)

Dr Noori Choi 2022-current;

Dr Daniela Roessler 2021-current;

Dr Kaz Uyehara 2019-current;

Dr Aneesh Bose 2018-current

PhD Students (10; 7 Primary, 3 Co-advised*)

Maëlan Tomasek 2022-current. Cognition in social fishes.

Myriam Knöpfle 2021-current. Tactile stimulation as a behavioural mechanism to manipulate producers and increase scrounger access to prey in marine fish.

Oceane Ferreira* 2020-current. Behavioural flexibility in social fish (co-advised with Barbara Taborsky)

Pranav Minasandra* 2020-current. Social entrainment of circadian rhythms in cichlids (co-advised with Ariana Strandburg-Peshkin)

Ma Bin 2019-current. Patterns of neural activity in socially divergent cichlids

Paul Nührenberg 2019-current. The evolution of social behaviour in Tanganyikan cichlids

Anja Melena Mendez Wegner 2019-current. The interplay between physical structure and social behaviour of animals

Etienne Lein 2016-2023. The role of cognitive and behavioural flexibility for social evolution - re-examining the Social Brain Hypothesis

Ian Etheredge 2016-2021. Machine-learning of natural ornamentation

Jian Zhao* 2016-2019. Dominance structures and feeding behaviour in Tilapia aquaculture (co-advised with Zhangying Ye)

MSc Students (18; 16 Primary; 2 Co-advised*)

Jan Oberkofler 2021-2022. Does kinship underlie within-group aggressive interactions in *Neolamprologus multifasciatus*?

Zoe Goverts 2021-current. Territorial behaviour in a Mediterranean Wrasse

Cecile Aprili 2020-2020. Machine learning of social behaviours in Tanganyikan cichlids

Julien Bouvet 2020-2021. Modelling behavioural complexity of social agents

Myriam Knöpfle 2020-2021. A novel form of social bargaining. Tactile stimulation in a foraging context

Ana Zaalishvili 2019-2020. Parental care state affects social network structure in group-living fish

Rolf Walter 2019-2021. Hierarchy affects response to predation threats in a group-living fish

Lukas Koch 2021-2022. Turn-taking behaviour as a signature of social evolution

Sylvia Garza 2020. Male trajectory as a reproductive strategy the sexually cannibalistic spider *Trichonephila clavipes*

Huy Nguyen 2020. Contest behaviour in cichlid fishes is mediated by social evolution

David Kolb* 2020. Comparing machine-learning approaches to natural image segmentation in Lake Tanganyika

Jakob Gübel 2018-2020. Territory defence and peace-keeping are sex- and space-dependent in group-living fish

Fritz Francisco 2019. Understanding how predation shapes the internal dynamics of fish schools in the wild

Paul Nührenberg 2019. Motion patterns, predictability and predation responses within a wild, freely moving fish school

Manuel Wildner* 2017. FIMTrack. A specified application for tracking fish

BSc Students (16; 14 Primary, 2 Co-advised*)

Zoe Umbach 2022-2022; Hidden in Plain Sight? Testing Eye Camouflage in Jumping Spiders

Anna Stanton 2021-2021; Jumping spider behaviour

Jan Oberkofler 2020-2021. Does kinship underlie within-group aggressive interactions in *Neolamprologus multifasciatus*?

Florian Kaempf 2020-2021. Contest behaviour across Lamprologine cichlids

Karina Weiler 2020-2021. Mirror self-recognition in wild wrasse

Rosanna Stolberg 2020. Evaluating waterborne hormone extraction as a method for understanding behavioural responses in the Tanganyikan cichlid radiation

Zoe Goverts 2020. Territorial behaviour in a Mediterranean Wrasse

Timothy Singer 2019. Predatory influence on the social behaviour of the shell-dwelling cichlid *Neolamprologus multifasciatus*

Dimitar Garkov* 2019. Mapping brain structure in virtual reality

Jacqueline Dettinger 2018. Changes in social hierarchy affect collective network structure of cichlid fish groups

Ivo Neufert 2018. Male reproductive plasticity in the face of changing fecundity and genetic benefits

Lukas Koch 2018. Extended Phenotype Construction of Shell Dwelling Lamprologine Cichlids

Nadja Vögtle 2018. Is display laterality in male guppies context-dependent?

Jakob Gübel 2017. Can the structure of a spider web be inferred by behavioural tracking?

Kai Schleifer 2017. Effects of individual state on social group structure of spiders

Robert Felbier 2017. Social spider behaviour. Exploring the possibilities of basic agent based modeling

Thesis advisory committee students

Ash Parker (Baier Lab, MPI Neurobiology) 2018-current, Qiaoyi Liang (Baldwin Group, MPI Ornithology).

TEACHING AND SYMPOSIA

Course coordinator Quantitative Field Biology – 2017-present

For Masters VtK course Quantitative Field Biology at The University of Konstanz. I was nominated for a University LUKS teaching award, and received a transdepartmental teaching award for this course.

Course coordinator Collective Animal Behaviour – 2016-present

For Masters VtK course Collective Animal Behaviour at The University of Konstanz.

Keynote Instructor CAJAL Quantitative Approaches to Behaviour - 2022

Lecturer Animal Behaviour – 2016-Present

For undergraduate course Animal Behaviour at The University of Konstanz

Lecturer Research Methods – 2013-2015

For course Research Methods, UTeach program, University of Texas at Austin. This course teaches junior and senior undergraduate students, in training to be high school science teachers, about the scientific method with an emphasis on statistical and mathematical modelling. I received a 4.8 out of 5 in instructor evaluations.

Conference organiser – Alpine Cichlid Symposium 2016

A yearly conference held in Konstanz for cichlid researchers. In 2016 we had 10 attendees, and in 2018 we had more than 80 attendees from across Europe and world.

Organising committee – ASAB Summer conference 2019

Committee member for conference “New Frontiers in the Study of Animal Behaviour” Konstanz

REFERENCES

Professor Michael Ryan (Postdoctoral Advisor, UT Austin)
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Professor Madeleine Beekman (Honours Advisor, University of Sydney)
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OTHER SKILLS

European Scientific Diving Mission Leader

American Academy of Underwater Sciences Diver

PADI Rescue Diver

Boat driver licence

3rd Degree HapKiDo Black Belt

3rd Degree TaeKwonDo Black belt