

## Iain D. Couzin

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Centre for the Advanced Study of Collective Behaviour, University of Konstanz  
Department of Biology, University of Konstanz, Germany

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### Personal Details

Name: Iain Douglas Couzin

### Professional preparation

University of St. Andrews, UK	Biology	B.Sc. Hons. 1 <sup>st</sup> class, 1995
University of Bath, Bath, UK	Biology	Ph.D., 1999
University of Leeds, Leeds, UK	Postdoctoral researcher	2000 – 2002
Balliol College, Oxford, UK	Junior Research Fellow	M.A. (Oxon), 2003
Princeton University, Princeton, USA	Pew Biocomplexity Fellow	2002 – 2005
University of Oxford, Oxford, UK	Zoology & Math. Biol.	2002 – 2005

### Appointments

June 2019 – present	Director, Max Planck Institute of Animal Behavior, Department of Collective Behaviour, Konstanz, Germany
Jan 2019 – present	Co-Director, Centre for the Advanced Study of Collective Behaviour, German Science Foundation Cluster of Excellence, U. Konstanz, Germany
Feb 2015 – present	Chair of Biodiversity and Collective Behaviour, Department of Biology, University of Konstanz, Germany
Oct 2014 – May 2019	Director, Max Planck Institute for Ornithology, Konstanz, Germany
Feb 2013 – Jan 2015	Full Professor, Department of Ecology and Evolutionary Biology, Princeton University <i>Affiliated Faculty in Princeton Environmental Institute, Program in Applied and Computational Mathematics, Quantitative and Computational Biology, Princeton Institute for Computational Science and Engineering.</i>
Nov 2007 – Jan 2013	Assistant Professor, Department of Ecology and Evolutionary Biology, Princeton University
2005 – 2007	Royal Society University Research Fellow, Dept. of Zoology, University of Oxford

### Awards

2023	Rothschild Distinguished Fellow, University of Cambridge
2022	The Gottfried Wilhelm Leibniz Prize
2022	Falling Walls Prize Life Sciences Winner
2022	Global Highly Cited Researcher, Web of Science Group, Clarivate
2019	The Lagrange Prize
2018 - present	Global Highly Cited Researcher, Web of Science Group, Clarivate
2013	The Zoological Society of London Scientific Medal
2012	National Geographic's Emerging Explorer Award
2012	Top 5 most cited articles of the decade (1999-2010), Lab Times publication analysis of Animal Behavior Research, Europe ( <a href="http://www.labtimes.org/">http://www.labtimes.org/</a> )
2011	PopTech Science and Public Leadership Award
2010	Popular Science Magazine's 'Brilliant 10' Award
2009	The Mohammed Dahleh Award, UC Santa Barbara
2008	Searle Scholar Award
2005	Royal Society University Research Fellowship
2003	Junior Research Fellowship in the Sciences, Balliol College, Oxford

### Select named/distinguished lectures

2023	Rothschild Distinguished Lecture, University of Cambridge, UK
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- Plenary Speaker, Dubrovnik Conference on Cognitive Science, Croatia
- 2022 Falling Walls Science Breakthroughs of the Year, Berlin  
The Rhodes Lecture, Emory University, USA  
Plenary Speaker, SIAM Conference on the Life Sciences, Pittsburgh, USA  
Keynote Address, NIH Brain Behavior and Synchronization Workshop, Bethesda, USA
- 2021 Keynote Speaker, Conference on Complex Systems, Lyon, France  
Keynote Speaker, International Forum on Advanced Environmental Sciences and Technology (iFAST) in honor of Simon Levin's 80th birthday  
Plenary Speaker, European Brain and Behavior Society Meeting, EPFL, Switzerland
- 2020 Keynote Address, New Perspectives for Science, Tübingen, Germany  
Keynote Speaker, Society for Experimental Biology Meeting, Prague, Czech Republic  
Plenary Lecture, Advanced Course on Systems Biology, Innsbruck, Austria  
Plenary Lecture, German Ethological Society Meeting, Tübingen, Germany  
Keynote Address, Biology20, Fribourg, Switzerland
- 2019 Tokyo Prize (Japanese Emperor Prize) Symposium, Tokyo, Japan  
Annual Distinguished Lecture, Cognitive, Computational and Systems Neuroscience (CCSN), Washington University in St. Louis  
Keynote Speaker, VIII. Complexitat, Barcelona, Spain  
SciFoo, GoogleX, USA  
Presentation to the Governing Board of the Wellcome Trust, Munich  
Plenary Speaker, Complex Systems Summer School, Bari, Italy  
Public Lecture, SAGE Centre for the Study of the Mind at the University of California Santa Barbara  
Plenary Speaker, VIP Opening Event, TownHall Europe, The Davignon Center for New Leadership, Brussels  
Plenary Speaker, 20th Anniversary of the Ecology and Evolutionary Biology Interdisciplinary Program at Texas A&M University  
Plenary Speaker, Computational Social Science - Quo Vadis, ETH Zurich  
Plenary Speaker, Complexitat Day, Barcelona  
Keynote Speaker, Life 2019, Utrecht, Netherlands
- 2018 The Darwin Lecture, University of Cambridge, UK  
The Gatsby Lecture, COSYNE (Computational and Systems Neuroscience), Denver, CO, USA  
The Immelmann Lecture, University of Bielefeld, Germany  
Public Lecture, Centre for Interdisciplinary Research (ZiF), University of Bielefeld, Germany  
Plenary Speaker, 4th International Conference on Computational Social Science, Northwestern University, USA.  
Plenary Speaker, PINC Conference, Netherlands.  
Opening Plenary Lecture, CAJAL Advanced Course in Behavior and Neural Systems, Champalimaud Centre, Lisbon, Portugal  
Plenary Lecture, Complexity Science Hub, Vienna, Austria  
Keynote Speaker, International Summit on Social Cognition in Humans and Robots, Hamburg, Germany  
Session Chair, Friends of Europe high-level European Union roundtable, Brussels, Belgium  
Keynote Speaker, International Conference on Computational Social Science (IC2S2), Kellogg School of Management at Northwestern University, USA
- 2017 Siemens Lecture, Carl Friedrich von Siemens Foundation, Munich, Germany

- Opening Plenary Address, Ecology Across Borders (the Joint Annual meeting of the British Ecological Society, The Ecology Society of Germany, Austria and Switzerland, The Netherlands Ecological Society and the European Ecological Federation)  
 The Evening Keynote Address, Boston Consulting Group Alumni Meeting, Munich, Germany  
 The Odum Lecture, University of Georgia, USA  
 The Bowen Lecture, Johns Hopkins Campus, Rockville, USA  
 Public Lecture, Science Meets Music, Benjamin Hall, Jupiter, FL, USA  
 Plenary Speaker, The 50th Anniversary Symposium of the Fisheries Society of the British Isles, University of Exeter, UK  
 Public Lecture, Mathematical Models in Ecology and Evolution, City University of London, London, UK  
 The Complex Systems Public Lecture, University of Sheffield, Sheffield, UK
- 2016 Plenary Speaker, The European Conference of Behavioural Biology, Vienna  
 Keynote address, the 6th Brain and Behavior Meeting, Haifa, Israel  
 German Academy of Sciences (Leopoldina) Plenary, Modeling Nature and Society, Weimar  
 Plenary Speaker, ETH Zurich / Max Planck Institute Workshop: Design and Coordination of Micro- to macro-scale Swarms  
 BIG Seminar, University of Lausanne, Switzerland
- 2015 Director's Seminar, Howard Hughes Medical Institute (HHMI), Janelia Research Campus  
 Opening Keynote Speaker and Closing Address, Frielandtage, German Primate Centre, Göttingen  
 Plenary Speaker, Lake Como Summer School on Complexity, Italy  
 Plenary Speaker, Physics of Emergent Behaviour, London Science Museum  
 SciFoo, Googleplex, Mountainview, California  
 Plenary Speaker, The Champalimud Neuroscience Symposium, Lisbon, Portugal  
 Directors' Seminar, Max Planck Institute for Intelligent Systems, Tübingen, Germany  
 Plenary Speaker, Animal Social Networks in Behavioral Research, University of Neuchatel, Switzerland  
 Plenary Speaker, AniMove workshop, Max Planck Institute for Ornithology, Radolfzell, Germany  
 Ernst Strüngmann Forum, Complexity and Evolution  
 Plenary Speaker, The Scottish Informatics and Computer Science Alliance Workshop on Computational Ecology, University of Edinburgh, Scotland, UK
- 2014 The Kwanghil Koh Lecture on Mathematics in Our Time, College of Sciences, NC State University  
 Plenary Speaker, Max Planck International Research School in Organismal Biology, Grand Challenges Symposium, Konstanz, Germany  
 Plenary Speaker, The Joint Annual Meeting of the Society of Mathematical Biology and the Japanese Society for Mathematical Biology, Osaka, Japan  
 Keynote Address, 13th International Conference on Autonomous Agents and Multiagent Systems, Paris, France  
 The Institute of Science and Technology (IST) Distinguished Lecturer Series, Austria  
 Interdisciplinary Distinguished Seminar, Federal Laboratory for Analytical Sciences and the Army Research Office, NC, USA  
 Public Lecture and Keynote, Courant Research Center Symposium "Evolution of Social Behavior", University of Göttingen, Germany  
 Plenary Speaker, Interaction Networks and Collective Motion in Swarms, Flocks and Crowds, Helsinki, Finland  
 Plenary Speaker, Animal Behavior Society Meeting, Princeton, USA

- 2013 Benjamin Meaker Visiting Professorship, Institute for Advanced Studies, University of Bristol  
 BBC World Service & Wellcome Collection, "Exchanges at the Frontier, with Iain Couzin"  
 London, broadcast on BBC World Service  
 Public Lecture, Institute for Advanced Studies and Worldwide Universities Network, Bristol.  
 Plenary Speaker, Behaviour 2013, Newcastle, UK  
 Plenary Speaker, Animal Movement in Confined Space, University of Bristol, UK  
 Center for Immunity, Infection and Evolution Visiting Professor, University of Edinburgh  
 Howard Hughes Medical Research Institute, "Pathbreaking careers in science"  
 Keynote Address, Israel Society of Ecology and Environmental Sciences  
 The Jacob Marschak Speaker, UCLA Anderson School of Management
- 2012 The Murray Visiting Professorship, University of Sydney, Australia  
 Bernard Rothenberg Lecturer in Biology and Public Policy, PA  
 von Neumann Public Lecture, Institute for Discovery, University of Wisconsin Madison  
 National Geographic Live! Discussion between Nobel Laureate Mario Molina and National  
 Geographic Explorer Iain D. Couzin  
 Keynote Address, Max Planck Symposium on Biodiversity, Berlin  
 N.J. Brainpower List  
 Public Lecture, Harvard Museum of Natural History  
 Keynote Address, NVIDIA GPU Technology Conference, San Jose  
 Visiting Professor, Tel Aviv University  
 Forum Speaker, Aspen Environment Forum, Aspen, Colorado  
 Keynote Address, NetSci 2012, Northwestern University  
 Plenary Lecture, Collective Intelligence 2012, MIT, Boston
- 2011 The Prosser Lecture, Dartmouth College  
 The Blundon Lecture, Nova Scotia  
 The Storer Lecture, UC Davis  
 BigThink Delphi Fellow  
 Plenary Lecture, Mathematical Biosciences Institute, Ohio State University  
 The Santa Fe Community Lecture, James A. Little Theatre, Santa Fe
- 2010 Public Lecture, Center for Science and Industry IMAX Theatre, Columbus, OH;  
 Distinguished Lecturer, Pacific Institute for Mathematical Sciences  
 Plenary Address, International Union for the Study of Social Insects (IUSSI),  
 Copenhagen  
 Keynote Address, Forum for the Future of Complex Systems, UNC, Charlotte  
 Distinguished Speaker, Pacific Institute for the Mathematical Sciences and Center for  
 Scientific Computing, Canada
- 2009 Mohammed Dahleh Distinguished Lecture, UC Santa Barbara  
 Top 10 most cited articles in 2009 (5<sup>th</sup>), *Phil. Trans. Roy. Soc. Lond. B*  
 Member of the Faculty of 1000 Biology
- 2008 The Marsden Lecture, McGill University, Canada  
 World Science Festival, NYC  
 Keynote Lecture, 'Formation flying, missions and technologies', European Space Agency
- 2007 Plenary speaker, International Conference on Complex Systems, Boston  
 Plenary speaker, Society for Industrial and Applied Mathematics (SIAM) Dynamics,  
 Snowbird, Utah  
 Plenary speaker, Dynamics Days, Boston
- 2003 Fellow of the Center for Interdisciplinary Research, University of Bielefeld

### **Additional Invited Seminars and Lectures (from 2007)**

- 2022 The Cambridge Centre for Physical Biology Seminar, Cambridge University, UK  
From Individual to Collective Behaviour in Biological and Robotic Systems, International Centre for Mathematical Sciences, Edinburgh, UK
- 2021 Intelligent-ish: how dumb agents do clever things, Sainsbury Wellcome Centre, University College London, UK
- 2019 Special Seminar, HSRCB, MCB, Quant Bio and OEB, Harvard University  
Airbus BlueSky Participant, Flying Brains Workshop, Munich  
MIT Mechanical Engineering Colloquium, MIT, Boston  
Lecturer, Federation of European Neuroscience Societies (FENS) - Hertie Winter School on Neural Control of Instinctive and Innate Behavior  
Colloquium for Neuroinformatics, University of Zurich and ETH Zurich  
Invited Speaker, Nutritional Homeostasis Workshop, LIMES Institute, University of Bonn  
Lecturer, Summer School - Complex networks: theory, methods and applications, Lake Como School of Advanced Studies  
Invited Speaker, Computation in Biological Systems, Society for Experimental Biology Annual (SEB) Meeting, Seville, Spain
- 2018 Columbia University Integrative Animal Behavior Seminar  
Columbia University Neuroscience Seminar  
6th Annual Toulouse Economics and Biology Workshop, Toulouse, France  
Sölden Neuroscience Symposium, Sölden, Austria  
German Physical Society Meeting, Physics of Contagion Processes, Berlin, Germany  
Departmental Seminar, Neurobiology, Weizmann Institute of Science, Israel  
Speaker, International neuroscience Conference, Sölden, Austria  
Speaker, 6th Toulouse Economics and Biology Workshop, France
- 2017 MIT Colloquium on Brain and Cognition, MIT, Boston, USA  
Centre for Brain Science Seminar, Harvard University, USA  
Integrative Research Institute for the Life Sciences (ISI) Seminar, Humboldt University, Berlin, Germany  
Speaker, Max Planck - Chinese Academy of Sciences Conference on Mechanisms of Animal Behavior, Shanghai, China  
Speaker, World health Summit, Berlin, Germany  
Speaker, Biologing Symposium, Konstanz, Germany  
Speaker, Gordon Conference on Movement Ecology of Animals, Ventura, USA  
Heidelberg Institute for Theoretical Studies Colloquium, Heidelberg, Germany  
Speaker, Journal of Experimental Biology Symposium on the Evolution of Social Behavior, The Eiger, Switzerland  
The Munich Centre for Neurosciences Seminar, Germany
- 2016 Departmental Seminar, Zoology, Cambridge University, Cambridge, UK  
Centre for Integrative Biology Seminar, University of Toulouse, Toulouse, France  
Integrative Research Institute for Life Sciences Seminar, Humboldt University, Berlin  
Biology Symposium, University of St. Andrews, Scotland  
Interfacultative Munich Center for Neurosciences – Brain and Mind of the Ludwig-Maximilians-Universität  
Speaker, Transport Phenomena in Collective Dynamics, ETH Zurich, Switzerland  
Physics Colloquium, University of Konstanz, Konstanz, Germany
- 2015 Department Seminar, University of Exeter Cornwall Campus, UK

- CAnMove Seminar, University of Lund, Sweden
- 2014 Interdisciplinary Center for Life Sciences and Engineering Seminar, Technion - Israel Institute of Technology  
 Department of Biology Seminar, Bar Ilan University, Israel  
 6th SIDEER Symposium, Exploring Real World Networks, From Genes to Ecosystems, Sede Boqer Campus of Ben Gurion University, Israel  
 Shalom Applebaum Memorial Lecture, The Hebrew University, Rehovot, Israel  
 Departmental Seminar, Department of Evolution, Systematics and Ecology, The Hebrew University, Jerusalem, Israel
- 2013 Invited speaker, Deutsche Physikalische Gesellschaft Spring Meeting, Regensburg  
 Biophysics seminar, MIT  
 Graduate Student Invited Speaker, Department of Ecology and Evolutionary Biology, Cornell.  
 Graduate Student Invited Speaker, Department of Neurobiology and Behavior, Cornell.  
 Google Science Fair  
 Complexity Group Seminar, Stanford University  
 Office of Naval Research, Science of Autonomy Meeting  
 Center for Immunity, Infection and Evolution Special Seminar, University of Edinburgh  
 Batsheva de Rothschild Seminar on Marine Life in the Flow, Eilat, Israel  
 Organizer, Animal Swarms Workshop, Israel  
 Graduate student invited speaker, Department of Ecology and Evolutionary Biology, University of Arizona  
 Biocomplexity seminar, Stanford University
- 2012 *Science* magazine Live Chat, The Science of Decision-Making  
 Society for Social Neuroscience Annual Meeting, New Orleans  
 Sensory Coding and the natural Environment, IST Austria  
 Center for Studies of Physics and Biology, The Rockefeller University  
 Champalimaud Foundation Ar Event, Lisbon  
 Neuroscience Seminar, Champalimaud Center for the Unknown, Lisbon, Portugal  
 Departmental Seminar, Biology, Texas A&M  
 Departmental Seminar, School of Biological Sciences, UT Austin  
 Princeton Institute In Computational Science and Engineering Conference  
 Graduate Student Invited Speaker, School of Biological Sciences, UC Irvine  
 Department of Neuroscience, UC Irvine  
 School of Biological Sciences, University of Sydney  
 Department of Mathematics, University of Pittsburgh
- 2011 Department of Organismic and Evolutionary Biology Seminar, Harvard University  
 Department of Psychology Seminar, Harvard University  
 PopTech Conference, Maine  
 Undergraduate Invited Speaker, Dept. of Biochemistry, University of Pennsylvania  
 Graduate Student Invited Speaker, Tufts University  
 Graduate Student Invited Speaker, University of Florida  
 Plenary Speaker, Insect self-organization and swarming, Math. Biosci. Institute, Ohio State University  
 Graduate Student Annual Invited Speaker, University of Florida  
 Woods Hole Marine Biology Laboratory, Woods Hole  
 Institute of Evolution, University of Haifa, Israel  
 Ecology, Evolutionary Biology and Behavior, Michigan State University  
 City University of New York, New York  
 Ernst Strungmann Forum, Frankfurt institute for Advanced Studies

- 2010 Microbes to Metazoans: Evolution of Social Behavior, Georgia Tech, 2010  
 Workshop in Honor of Danny Cohen's 80<sup>th</sup> Birthday, The Hebrew University, Jerusalem  
 BIOCOMPLEXITY XI, The evolution of cooperation, Bloomington, Indiana  
 EVOS Seminar, Binghamton University  
 Department of Biology, Tel Aviv University  
 Department of Physics, University of Maryland  
 Lecturer, Complex Systems Summer School, Santa Fe  
 Workshop on Nonlinear Dynamics of Networks, University of Maryland  
 Workshop on Group Behavior, University of Arizona  
 Disease in Motion, Princeton University  
 Swarm Workshop, Max Planck Institute for the Physics of Living Systems, Dresden
- 2009 Applied Mathematics Colloquium, Cornell University  
 Robotics Institute, Carnegie Mellon University  
 DARPA Microsystems Technology Office Seminar, San Jose  
 Sloan-Schwartz Annual Meeting on Computational Neuroscience, Harvard University  
 Invitational speech, Board of National Institute of General Medical Sciences, Bethesda  
 Ecology Seminar, University of Pennsylvania  
 Workshop on Soft Active Materials, Syracuse University  
 Collective Decision Making Workshop, Santa Fe Institute, Santa Fe  
 Department of Neurobiology, Weizmann Institute, Israel
- 2008 Session Leader, Collective Animal Motion, Gordon Research Conference on Theoretical  
 Biology and Biomathematics, Italy  
 NSF Workshop on Complex Systems, Washington DC  
 Renaissance Technologies Colloquium, Long Island, NY  
 NIH Modeling Social Behavior, Bethesda, MD  
 Princeton Plasma Physics Laboratory, Princeton, NJ
- 2007 Divisional seminar, Division of Biology, Caltech  
 Department of Ecology and Evolutionary Biology and Institute for Genomics and  
 Systems Biology, University of Chicago  
 Centre for Integrative Multiscale Modeling & Control and Dynamical Systems, Caltech  
 Department of Biosciences, Birmingham University, UK  
 AAAS Meeting, San Francisco  
 Speaker, BIOCOMP, Italy  
 Departmental Seminar, Mechanical Engineering, MIT

### **Scientific Service**

- Honorary member of the Italian Society for Chaos and Complexity (2020 - )  
 Scientific Board of Trustees, BIOTOPIA, Natural History Museum of Bavaria (2020 - )  
 McDonnell Foundation Complex Systems Advisory Panel (2016 - )  
 Princeton University Press European Advisory Board (2016 - )  
 Committee Member for the Reorientation of the Max Planck Institute for Cybernetics, Tübingen  
 Editor, *eLife* (2014 - 2020)  
 Scientific Advisory Board, Institute for Pure and Applied Mathematics, UCLA (Oct 2014 - )  
 Editor, *Movement Ecology* (2012 - )  
 Editor, *Behavioral Ecology* (until mid-2011)  
 Editorial Board, *Journal of Nonlinear Science*  
 Associate Editor, *Advances in Complex Systems*  
 Editorial Board, *Swarm Intelligence*  
 Guest Editor, *PLoS Computational Biology*  
 Guest Editor, *PNAS USA (PNAS)*

Founding Advisory Board Member, National Institute for Mathematical and Biological Synthesis (NIMBioS). University of Tennessee, Knoxville.

Scientific Management Board / International Advisory Board, “Complex agent-based dynamic networks” research group at the University of Oxford (*until 2012*)

Advisory Board. Terreform ONE, Ecological Design Group for Urban Infrastructure, Planning and Art. Scientific Advisory Board, Lifeboat Foundation

Advisor, Harvard Business Review and the World Economic Forum, Manhattan, 2008

Advisor, Seed Business Group and the World Economic Forum, Cambridge, MA, 2008

Advisor to the NSF bio-directorate on systems biology, 2007

Adviser to the Department of Trade and Industry on ‘intelligent infrastructure’ (invited by Sir David King, Chief Scientific Advisor to H.M. Government), 2004

**Scientific Service (Princeton University)** Graduate Student Admissions Committee & Faculty Search Committee, Department of Ecology and Evolutionary Biology, 2010; Research Computing Advisory Group, 2010-2014; Institutional Animal Care and Use Committee, 2007-2010

### **Scientific Service (Outreach Activities)**

National Geographic Learning, Learning Statistics Book, “How statistics fit into the big picture”: employs my data to show real-world examples of using statistics to enable scientific discovery, 2012-present

Science magazine Live Chat, The Science of Decision-Making, 2012

The Secret Science Club, The Bell House, Brooklyn, 2011

PopTech, 2011 [http://poptech.org/popcasts/ian\\_couzin\\_collective\\_behavior](http://poptech.org/popcasts/ian_couzin_collective_behavior)

The OpenSwarm Initiative: to introduce collective behavior and pattern formation in nature to the public, and students across disciplines, through art, robotics and biology, from 2010

Metro High School, Columbus OH, Introducing the OpenSwarm Initiative

RadioLab’s AWE-MAGEDDON Curiosity Cabaret, Manhattan, NYC, 2010

<http://www.wnyc.org/thegreenespace/events/2010/apr/14/radiolabs-awe-maggeddon/>

The Secret Science Club, Brooklyn, NYC, 2010

BigThink Interview, 2010

World Science Festival, Manhattan, NYC: “Traffic, from insects to interstates” panelist with Mitchell Joachim and Anna Nagurny, moderated by Robert Krulwich, 2009

Edge.org “Interview with Iain Couzin” selected for Harper Collins Book “Best of Edge”, 2009

Science on Saturday, for middle- and high-school students, 2008

Plenary speaker at the International IdeaFestival, Kentucky

Featured in, “Cool Careers in Science”, Sally Ride Science (for upper elementary and middle school) and one of 5 scientists featured in “Social Lives of Animals” by Scholastic (for ages 7-9)

AimHigher Masterclasses at Newcastle United’s “St. James Park” and Sunderland F.C.’s “The Stadium of Light”: to raise aspirations, awareness and attainment of young people from disadvantaged backgrounds, under-represented groups and people with disabilities, 2005

### **Publications**

#### **2023**

[159] Davidescu, M.R., Romanczuk, P., Gregor, T. & Couzin, I.D. (2023) Growth produces coordination trade-offs in an animal lacking a central nervous system. **PNAS** 120 (11), e2206163120

[158] Couzin, I. D., & Couzin-Fuchs, E. (2023). The chemical ecology of locust cannibalism. **Science** 380(6644), 454-455.



[157] Nagy, M., Naik, H., Kano, F., Carlson, N., Koblitz, J.C., Wikelski, M. & Couzin, I.D. (2023) SMART-BARN: Scalable Multimodal Arena for Real-time Tracking Behaviour of Animals in laRge Numbers. **Science Advances**, in press.

[156] Neubauer, L., Davidson, J.D., Wild, B., Dormagen, D.M., Landgraf, T., Couzin, I.D. & Smith, M.L. (2023) Honey bee drones are synchronously hyperactive inside the nest, **Animal Behaviour**, in press.

[155] Oscar, L., Li, L., Gorbonos, D., Couzin, I.D., & Gov, N. S. (2023). A simple cognitive model explains movement decisions in zebrafish while following leaders. **Physical Biology**, 20(4), 045002.

[154] Couzin, I.D., & Li, L. (2023). The benefits of swimming together. **eLife**, 12, e86807.

[153] Koger, B., Deshpande, A., Kerby, J.T., Graving, J. M., Costelloe, B. R., & Couzin, I.D. (2023). Quantifying the movement, behaviour and environmental context of group-living animals using drones and computer vision. **Journal of Animal Ecology** 92(7), 1357-1371.

[152] Sridhar, V. H., Davidson, J. D., Twomey, C. R., Sosna, M. M., Nagy, M., & Couzin, I.D. (2023). Inferring social influence in animal groups across multiple timescales. **Philosophical Transactions of the Royal Society B**, 378(1874), 20220062..

[151] Naik, H., Chan, A. H. H., Yang, J., Delacoux, M., Couzin, I.D., Kano, F., & Nagy, M. (2023). 3D-POP- An automated annotation approach to facilitate markerless 2D-3D tracking of freely moving birds with marker-based motion capture. Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 21274-21284

[150] Couzin, I.D. & Heins, C. (2023) Emerging technologies for behavioral research in changing environments. **Trends in Ecology and Evolution**, 38(4), 346-354.

## 2022

[149] Kano, F., Naik, H., Keskin, G., Couzin, I.D. & Nagy, M. (2022) Head-tracking of freely-behaving pigeons in a motion-capture system reveals the selective use of visual fields, **Scientific Reports** 12(1), 1-15.

[148] Jolles, J., Sosna, M.M.G., Mazué, G., P.F., Twomey, C.R., Bak-Coleman, J., Rubenstein, D.I. & Couzin, I.D. (2022) Both predator and prey features predict the predation risk and survival of schooling prey. **eLife** 11, e76344.

[147] Bak-Coleman, J.B., Tokita, C.K., Morris, D.H., Rubenstein, D.I. & Couzin, I.D. (2022) Collective wisdom in polarised groups, **Collective Intelligence** 1(1), 26339137221104788.

[146] Waldman, U., Nail, H., Nagy, M., Kano, F., Couzin, I.D., Deussen, O. & Goldlücke, B. (2022) I-MuP-PET: Interactive multi-pigeon pose estimation and tracking, In **DAGM German Conference on Pattern Recognition**, pp. 513-528. Cham: Springer International Publishing.

[145] Smith, M.L., Davidson, J.D., Wild, B., Dormagen, D.M., Landgraf, T. & Couzin, I.D. (2022) Behavioural variation across the days and lives of honey bees, **iScience** 10482.

[144] Heins, C., Millidge, B., Demekas, D., Klein, B., Friston, K., Couzin, I.D. & Tschantz, A. (2022) pymdp: A Python library for active inference in discrete state spaces, **The Journal of Open Source Software** 7(73), 4098.

[143] Poel, W., Daniels, B. C., Sosna, M. M., Twomey, C. R., Leblanc, S. P., Couzin, I.D., & Romanczuk, P. (2022) Subcritical escape waves in schooling fish. **Science Advances** 8(25), eabm6385.

[142] Tuia, D. ... Couzin, I.D. et al. (2022) Perspectives in machine learning for wildlife conservation ` **Nature Communications**, 13, 792.

[141] Jetz, W. ... Couzin, I.D. et al., (2022) Biological Earth observation with animal sensors. **Trends in Ecology and Evolutionary Biology**, 37(4), 293-298.

## 2021

[140] Sridhar, V.H., Li, L., Gorbonos, D., Nagy, M., Schell, B.R., Sorochnik, T., Gov, N.S. & Couzin, I.D. (2021) The geometry of decision-making in individuals and collectives, **PNAS** 118 (50), e2102157118.

[139] Bak-Coleman, J. B., Alfano, M., Barfuss, W., Bergstrom, C.T., Centeno, M.A., Couzin, I. D., ... & Weber, E. U. (2021). Stewardship of global collective behavior. **PNAS**, 118 (27), e2025764118.

[138] Lutz, M.J., Reid, C.R., Lustri, C.J., Kao, A.B., Garnier, S. & Couzin, I.D. (2021) Individual error correction drives responsive self-assembly in army ant scaffolding structures, **PNAS** 118 (17), e2013741118.

[137] Bath, D.E., Graving, J.M., Walter, T., Vizcaíno, J.P. & Couzin, I.D. (2021) Collective sensing in mobile animal groups, *in revision at* **Current Biology**.

[136] Walter, T., & Couzin, I. D. (2020). TRex, a fast multi-animal tracking system with markerless identification, 2D body posture estimation and visual field reconstruction, **eLife** 10: e64000.

[135] Li, L., Ravi, S., Xie, G., & Couzin, I. D. (2021). Using a robotic platform to study the influence of relative tailbeat phase on the energetic costs of side-by-side swimming in fish. **Proceedings of the Royal Society A**, 477(2249), 20200810.

[134] Marcelino, R., Sampaio, J., Amichay, G., Gonçalves, B., Couzin, I. D., & Nagy, M. (2021). Collective Behavior in Football. *Match Analysis: How to Use Data in Professional Sport*, 18.

[133] Wild, B., Dormagen, D.M., Zachariae, A., Smith, M.L., Traynor, K.S., Brockman, D., Couzin, I.D. & Landgraf, T. (2020) Social networks predict the life and death of honey bees, *in revision at* **Nature Communications**.



## 2020

[132] Li, L., Nagy, M., Graving, J.M., Bak-Coleman, J., Xie, G & Couzin, I.D. (2020) Vortex phase matching as a strategy of schooling in robots and in fish, **Nature Communications** 11(1), 1-9.

[131] Jolles, J., Mazué, G., Davidson, J., Behrmann-Godel, J. & Couzin, I.D. (2020) *Schistocephalus* parasite infection alters sticklebacks' movement ability and thereby shapes social interactions, **Scientific Reports** 10, 12282.

[130] Nagy, M., Horicsányi, A., Kubinyi, E., Couzin, I.D., Vásárhelyi, G., Flack, A. & Vicsek, T (2020) Synergistic benefits of group search in rats, **Current Biology** 30, 1-6.

[129] Hugo, H., Marcel, G., Hermes, M.G., Garcete-Barrett, B.R. & Couzin, I.D. (2020) First evidence of wasp brood development inside active nests of a termite with the description of a previously unknown potter wasp, **Ecology and Evolution** 10, 12663-12674.

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[16] Couzin, I.D., Krause, J., Franks, N.R. & Levin, S.A. (2005) Effective leadership and decision making in animal groups on the move. **Nature** 433, 513-516.

[15] Wrege, P., Wikelski, M., Mandel, J.T. Rassweiler, T & Couzin, I. D. (2005) Antbirds parasitize foraging army ants. **Ecology** 86(3), 555-559.



[14] Hensor, E.M.A., Couzin, I.D., James, R. & Krause, J. (2005) Modelling density-dependent fish shoal distributions in the laboratory and field. **Oikos** 110, 344-352.

[13] Hoare, D.J., Couzin, I.D., Godin, J-G. & Krause, J. (2004). Context-dependent group size choice in fish. **Animal Behaviour** 67, 155-164.

[12] Couzin, I.D. & Krause, J. (2003) Self-organization and collective behavior in vertebrates. **Advances in the Study of Behavior** 32, 1-75.

[11] Couzin, I.D. & Franks, N.R. (2003) Optimized traffic flow and self-organized lane formation in ants. **Proceedings of the Royal Society of London, Series B** 270, 139-146.

- Featured as 'Editor's Choice' in *Science*

[10] Croft, D. P., Arrowsmith, B. J., Bielby, J., Skinner, K., White, E., Couzin, I.D., Magurran, A. E., Ranmarine, I. & Krause, J. (2003) Mechanisms underlying shoal composition in the Trinidadian guppy (*Poecilia reticulata*) **Oikos** 100, 429-438.

[9] Croft, D. P., Krause, J., Couzin, I.D. & Pitcher, T. J. (2003) When fish schools meet: outcomes for evolution and fisheries **Fish and Fisheries** 4, 138-146.

[8] Couzin, I.D., Krause, J., James, R., Ruxton, G.D. & Franks, N.R., (2002) Collective memory and spatial sorting in animal groups. **Journal of Theoretical Biology** 218, 1-11.

- Recommended by Faculty of 1000
- Top 5 most cited articles of the decade (1999-2010), Animal Behavior Research, Europe

[7] Ward, A. J. W., Hoare, D. J., Couzin, I.D. & Krause, J. (2002) The effects of parasitism and body length on positioning within wild fish shoals **Journal of Animal Ecology** 71(1), 10-14.

[6] Couzin, I.D. & Krause, J. (2001) The social organization of fish schools **Advances in Ethology** 36, 64.

[5] Hoare, D. J., Ward, A., Couzin, I.D., Croft, D. & Krause, J. (2001) A grid-net technique for the analysis of fish positions in free-ranging fish schools **Journal of Fish Biology** 59(6), 1667-1672.

[4] Roditakis, E., Couzin, I.D., Barlow, K., Franks, N. R. & Charnley, A. K. (2000) Improving secondary pick up of insect fungal pathogen conidia by manipulating host behavior **Annals of Applied Biology** 137, 329-335.

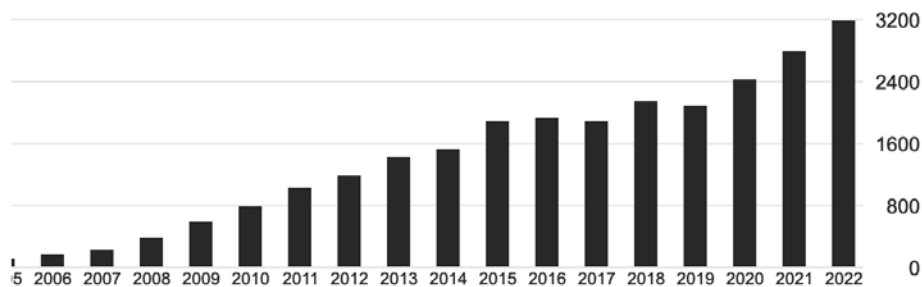
[3] Boi, S., Couzin, I.D., Del Buono, N., Franks, N. R. & Britton, N. F. (1999) Coupled oscillators and activity waves in ant colonies **Proceedings of the Royal Society of London Series B** 266, 371-378.

[2] Spencer, A. J., Couzin, I.D. & Franks, N. R. (1998) The dynamics of specialization and generalization within biological populations **Journal of Complex Systems** 1, 114-128.

[1] Ritchie, M. G. R., Couzin, I.D. & Snedden, W.A. (1995) What's in a song? Female bushcrickets discriminate against the song of older males **Proceedings of the Royal Society of London Series B** 262, 21-27.

### Citation analysis (via Google Scholar)

Citations: 28,311



### Most cited papers:

Couzin et al. (2005) *Nature*, 2924 citations  
Couzin et al. (2002) *J.Theor Biol.*, 2287 citations  
h-index = 75  
i10-index = 138

### Funding

Advanced Simulation, Analysis and Interpretation of Network Structures in Biological Data “Smart-Nets”

Agency: ERC Marie Sklodowska-Curie Actions, Innovative training Networks (ITN)

Award: € 3.36 million

Duration: 2020 – 2024

Individual Differences and Bio-Inspired Design of Vehicle Group Dynamics (Co-PI with Naomi

Leonard and Fumin Zhang)

Agency: ONR

Award: \$ 3.00 million

Duration: 2019 – 2024

The Centre for the Advanced Study of Collective Behaviour (PI, with Co-PIs Oliver Deussen and Urs Fischbacher)

Agency: The German Science Foundation (DFG)

Award: €30.5 Million

Duration: 2019 - 2025

The Center for Visual Computing of Collectives (PI, with Daniel Keim Co-PI)

Agency: The German Federal and State Government

Award: €32.0 Million

Duration: From 2016

Alliance for organismal Interaction Analysis (ALIAS) (PI, with Oliver Deussen Co-PI)  
Agency: Regionale Forschungallianzen in Baden-Württemberg Award: €0.9 Million  
Duration: From 2016

Collective animal behaviour (Structure and Innovation Fund for Research) (PI)  
Agency: Ministry of Science, Research and the Arts Baden-Württemberg Award €1.5 Million  
Duration: From 2014

Center for Reality Mining of Animal-Human Systems (PI)  
Agency: Humboldt-Princeton partner Program Award: \$0.05 Million  
Duration: 10/1/2014 - 9/30/15

Sensory Networks and Collective Information Processing in Animal Groups (PI)  
Agency: National Science Foundation Award: \$0.32 Million  
Duration: 02/01/2014 - 02/01/2018

Bio-inspired scalable collaboration of autonomous vehicles that sense, learn and decide (Co-PI with Naomi Leonard, Princeton and Fumin Zhang, Georgia Institute of Technology.  
Agency: Office of Naval Research Award: \$2.23 Million  
Duration: 07/01/2014-6/30/2018

Robustness and Adaptability in Collective Behavior (Co-PI with Simon Levin and Naomi Leonard)  
Agency: Army Research Office Award: \$0.36 Million  
Duration: 07/01/2014-6/30/2017

Information processing and computation in fish groups (co-PI with Gasper Tkacik, Austria and Elad Schneidman, Weizmann Institute, Israel)  
Agency: Human Frontiers Science Program Award: \$1.05 Million  
Duration: 05/01/2012 - 04/31/2015

CNH: Social-ecological complexity and adaptation in marine systems (Co-PI with Simon A. Levin),  
Agency: National Science Foundation Award: \$1.5 Million  
Duration: From 10/01/2012 - 10/01/2016

The Perceptual Basis for Collective Behavior in a Model Vertebrate (PI; Co-PI is Esteban Fernandez-Juricic, Purdue University)  
Agency: National Science Foundation  
Duration: From 10/01/2012 - 10/01/2013 Award: \$0.18 Million

A Platform for Data-Parallel GPU Computing at Princeton (Co-PI with David August, James Stone and Jeroen Tromp),  
Agency: National Science Foundation  
Duration: from 10/01/2012 Award \$0.35 Million

Experimental and Theoretical Analysis of Collective Dynamics of Swarming Systems (PI)  
Agency: National Science Foundation (NSF)  
Duration: 09/03/2009 – 09/30/2013 Award: \$0.54 Million

Coordination and collective decision-making (co-PI with Simon A. Levin and Naomi E. Leonard)  
Agency: Army Research Office  
Duration: 08/17/2011 - 06/16/2013 Award: \$0.42 Million

Bio-Inspired Autonomous Control for Optimal Exploration and Exploitation in Marine Environments  
(Co-PI with Naomi Leonard, Princeton University, and Fumin Zhang, Georgia Tech)  
Agency: Office of Naval Research (ONR)  
Duration: 06/01/2009 – 05/31/2014 Award: \$3.0 Million

Collective Behavior and Social Transmission of Information in Human Crowds (PI)  
Agency: Oxford Risk Research and Analyses Ltd.  
Duration: 09/15/2010 – 09/14/2012 Award: \$0.17 Million

Collective Motion and Decision-Making in Animal Groups (PI)  
Agency: Kinship Foundation, Searle Scholars Program  
Duration: 07/01/2008 – 06/30/2011 Award: \$0.3 Million

### **Selected media attention (needs to be updated)**

- (2015) Baboon-Trackers herald New Age in Animal Behaviour Research, by Ed Yong, National Geographic
- (2015) Planning a Holiday? Take Some Advice from Baboons, New Statesman
- (2014) Feature article by Michael Brooks, "Mind Meld: The Genius of Swarm Thinking", New Scientist magazine
- (2013) Feature article by Ed Yong: "As one: the science of swarms" WIRED magazine
- (2013) Front cover article by Christina Luiggi "Crowd Control" in The Scientist magazine
- (2013) National Geographic, "The real wisdom of crowds"
- (2013) New Scientist, "Swarm-mongering: Brainless blobs flock together"
- (2012) New York Times, Sunday Review, 'Walk like a fish'
- (2012) National Geographic, 'Can we control other peoples minds? Should we?'
- (2012) Discover, 'To work out why fish swim together, tempt a predator with virtual prey'
- (2012) NPR, 'Swarming up a storm: why animals school and flock'
- (2012) The Economist, 'The benefits of schooling'
- (2012) The Telegraph India, 'Fish spill group secret on video game'
- (2012) BBC News, 'Fish play video game in new behaviour study'
- (2012) Wired, 'Predatory fish play video game to answer evolutionary quandry'
- (2012) Wall Street Journal, 'Chips not just for gamers anymore'
- (2012) National Geographic Magazine, Emerging Explorers Award
- (2012) CNN, 'In Mauritania: sunny with a chance of locusts'
- (2011) BBC, Interviewed in 'The Code' BBC2, predicting human crowds
- (2011) TIME, 'America votes with the fishes'
- (2011) Wall Street Journal, 'A fishy study of uninformed voters?'
- (2011) Brunei Times, 'Minnows reveal true power of the 'uninformed''
- (2011) Wired, 'How ignorance could improve group decisions'
- (2011) BBC News, 'Disinterested 'key in democracy''
- (2011) Miller-McCune, 'Why a democracy needs uninformed people'
- (2011) ScienceNews, 'Uncommitted newbies can foil forceful few'
- (2011) Chronicle of Higher Education, 'Study of fish suggests the value of uninformed voters'
- (2011) Australian Broadcasting Corporation, 'Minnows reveal power of the uninformed'
- (2011) MSNBC.com, 'Can ignorance make a better democracy? In fish it can...'
- (2011) The Daily Mail, 'Vote for apathy?'
- (2011) The Economist, "Collective behavior: Follow my leader"

(2011) ScienceNews, 'School rules'

(2010) New York Times, Environment, "On the migratory trail, leaders and followers"

(2010) Popular Science Magazine, Featured as one of the 'Brilliant 10'

(2010) Wired Science, "How mass migration might have evolved"

(2010) Wired News, "Math is no match for locust swarms"

(2010) ScienceDaily, "Introducing robofish: leading the crowd in studying group dynamics"

(2010) Welt, "Roboterfisch führt schwärme"

(2010) Slashdot, "Robotfish' schools the rest"

(2010) SETI Radio, "Swarm in here ... or is it just me?"

(2010) Big Think, Interview with Iain Couzin: <http://bigthink.com/IainCouzin>

(2010) ScienceNews, "Swarming locusts impossible to predict"

(2009) Science Illustrated (front cover article 'Swarm!')

(2009) ABC News, Interviewed on 'Good Morning America'

(2009) "On My Mind" by Iain Couzin, SEED Magazine.

(2009) "Traffic: From insects to interstates", World Science Festival, New York City

(2008) BBC News, "Cannibal theory for locust swarms"

(2008) Channel 4 (UK) News, "Locusts driven by cannibalism"

(2008) Nature News, "Cannibalism drives locust swarms"

(2008) New Scientist, "The hunger the horror".

(2008) The Economic Times, "Cannibalism drives vast locust swarms"

(2008) Der Spiegel feature article "Schlauer im swarm"

(2008) Science Daily "What's bugging locusts?"

(2008) "Traffic" by Tom Vanderbilt, Random House Press (Chapter 4: Meet the World's Best Commuter: What We Can Learn From Ants, Locust and Crickets).

(2008) "Nature's Patterns: Flow" by Philip Ball, Oxford University Press (Chapter 5: Follow Your Neighbor: Flocks, Swarms and Crowds).

(2008) National Public Radio, "The physics of fish"

(2008) WNYC, The Brian Lehrer Show

(2007) New York Times, feature on my research by Carl Zimmer "From ants to people, an instinct to swarm", Science Times front cover

### **Television credits (IMDB)**

(2018) Wie Wissen, himself

(2017) Planet Wissen, himself

(2014) PBS, Nature: The Gathering Swarms, scientific consultant

(2013) BBC, Dara O'Brien's Science Club, himself

(2012) Nova, Science Now: 'What are animals thinking?', himself

(2011) BBC, The Code, 'Prediction', himself

(2010) National Geographic, *Great Migrations*:

- Feast or Famine, scientific consultant
- Race to Survive, scientific consultant
- Need to Breed, scientific consultant

(2009) BBC, *Swarm: Nature's Incredible Invasions*:

- One Million Heads one Beautiful Mind, scientific consultant
- When Worlds Collide, scientific consultant

(2004) BBC, *Massive Nature*:

- The Trap, scientific consultant.  
(2000) BBC, *Predators: Mass Attack*, scientific consultant and simulation developer