

# Colin J. Torney

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## Academic Appointments

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### Lecturer in Applied Mathematics

University of Exeter

2013–Present

### Postdoctoral Research Associate

Princeton University

2009–2013

## Education

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### PhD Applied and Computational Mathematics

University College Dublin

2009

### MSc Computational Science

University College Dublin

2005

### MEng Integrated Engineering

University of Liverpool

1999

## Publications

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A. F. A. Pellegrini, J. E. Watson, C. J. **Torney**, L. McManus, J. Bonachela, C. Chang, A. P. Dobson, Poaching and climate change: Interacting stochastic drivers of elephant population dynamics across Africa, in review.

A. Berdahl, C. J. **Torney**, E. Schertzer, S. A. Levin, On the evolutionary interplay between dispersal and local adaptation in heterogeneous environments, *Evolution* (in press).

C. J. **Torney**, T. Lorenzi, I. D. Couzin, S. A. Levin, Social information use and the evolution of unresponsiveness in collective systems, *Journal of the Royal Society Interface* 12 (103) (2015) 20140893.

A. Kao, N. Miller, C. J. **Torney**, A. Hartnett, I. D. Couzin, Collective learning and optimal consensus decision-making in animal groups, *PLoS Computational Biology* 10 (8) (2014) e1003762.

A. Strandburg-Peshkin, C. R. Twomey, N. W. Bode, A. B. Kao, Y. Katz, C. C. Ioannou, S. B. Rosenthal, C. J. **Torney**, H. S. Wu, S. A. Levin, et al., Visual sensory networks and effective information transfer in animal groups, *Current Biology* 23 (17) (2013) R709–R711.

L. Coburn, L. Cerone, C. J. **Torney**, I. D. Couzin, Z. Neufeld, Tactile interactions lead to coherent motion and enhanced chemotaxis of migrating cells, *Physical Biology* 10 (4) (2013) 046002.

C. J. **Torney**, S. A. Levin, I. D. Couzin, Decision accuracy and the role of spatial interaction in opinion dynamics, *Journal of Statistical Physics* (2013) 1–15.

A. Berdahl, C. J. **Torney**, C. C. Ioannou, J. J. Faria, I. D. Couzin, Emergent sensing of complex environments by mobile animal groups, *Science* 339 (6119) (2013) 574–576.

I. D. Couzin, C. C. Ioannou, G. Demirel, T. Gross, C. J. **Torney**, A. Hartnett, L. Conradt, S. A. Levin, N. E. Leonard, Uninformed individuals promote democratic consensus in animal groups, *Science* 334 (6062) (2011) 1578–1580.

C. J. **Torney**, A. Berdahl, I. D. Couzin, Signalling and the evolution of cooperative foraging in dynamic environments, *PLoS Computational Biology* 7 (9) (2011) e1002194.

C. J. **Torney**, S. A. Levin, I. D. Couzin, Specialization and evolutionary branching within migratory populations, *Proceedings of the National Academy of Sciences* 107 (47) (2010) 20394–20399.

S. Bazazi, C. C. Ioannou, S. J. Simpson, G. A. Sword, C. J. **Torney**, P. D. Lorch, I. D. Couzin, The social context of cannibalism in migratory bands of the mormon cricket, *PloS One* 5 (12) (2010) e15118.

J. Muñoz-García, Z. Neufeld, C. J. **Torney**, Nutrient exposure of chemotactic organisms in small-scale turbulent flows, *New Journal of Physics* 12 (10) (2010) 103043.

C. J. **Torney**, Z. Neufeld, I. D. Couzin, Context-dependent interaction leads to emergent search behavior in social aggregates, *Proceedings of the National Academy of Sciences* 106 (52) (2009) 22055–22060.

C. J. **Torney**, Z. Neufeld, Phototactic clustering of swimming microorganisms in a turbulent velocity field, *Physical Review Letters* 101 (7) (2008) 78105.

C. J. **Torney**, Z. Neufeld, Transport and aggregation of self-propelled particles in fluid flows, *Physical Review Letters* 99 (7) (2007) 078101.

## Presentations

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### **Social information use and the evolution of unresponsiveness in collective systems**

*ASAB Winter Meeting* December 2014

### **Information use and collective decisions in animal groups on the move**

*Biological Sciences Departmental Seminar, University of Bristol* November 2014

### **Information use and collective decisions in animal groups on the move**

*CEC Seminar Series, University of Exeter* February 2014

### **Information Use and Collective Behaviour in Animal Groups**

*Frontiers in Applied and Computational Mathematics, New Jersey Institute of Technology* June 2013

### **How Grouping Leads to Effective Information Use in Mobile Animals**

*SIAM Conference on Applications of Dynamical Systems* May 2013

### **Collective information use by social animal groups**

*EEB Colloquium on the Biology of Populations, Princeton University* January 2013

### **Collective information use by social animal groups**

*Center for the Study of Complex Systems, University of Michigan* November 2012

### **Collective behaviour and social information in mobile animal groups**

*CAIMS Annual Meeting, Toronto* June 2012

### **Structure, function and evolution in social animal groups**

*CUNY-NSF Workshop on Accelerators in High Performance Computing* June 2012

### **Information processing and collective decision making in social agents**

*CASL Computational Science Seminar, University College Dublin* September 2010

### **Specialization and evolutionary branching within migratory populations**

*Models in Population Dynamics and Ecology, Leicester* September 2010

### **Collective behaviour and large scale individual-based simulation**

*Animal-Plant Interactions Group Seminar, University of Sydney* April 2010

### **Small scale patchiness of phototactic micro-organisms in turbulent flows**

*European Geosciences Union General Assembly, Vienna* April 2008

### **Transport & aggregation of self-propelled particles in fluid flows**

*Complex Motion in Fluids, DTU Denmark* August 2007

## Professional Activities

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Program Committee: ANTS 2014

Reviewer for: *Animal Behavior*, *Behavioral Ecology*, *BMC Evolutionary Biology*, *Ecological Modeling*, *Ecology*, *Journal of Mathematical Biology*, *Journal of Theoretical Biology*, *New Journal of Physics*, *Nonlinearity*, *Physical Review E*, *Physical Review Letters*, *PLoS Computational Biology*, *PLoS One*, *PNAS*

## Volunteer & Work Experience

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July 2008: Team Coordinator & I.T. Teacher

Camara Computer Training, Tanzania

2005 to 2006: Investment Risk Analyst

Pioneer Alternative Investments, Dublin, Ireland

Jan to July 2004: English & I.T. Teacher

Pangani, Tanzania

2000 to 2003: Risk software developer

Misys International Banking Systems, London, England