

# Biological Sciences at Bristol

20  
20

Visit days

Dr Stephanie King, Head of Admissions

# Life Sciences building



Opened by  
Sir David Attenborough  
June 2014

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[bristol.ac.uk](http://bristol.ac.uk)

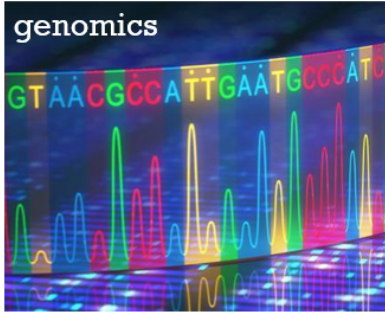
“This great building will give you and its graduates pleasure for the rest of your lives. It will play an important role in tackling the great problems and difficulties that the world is going to face in your generation.”

Sir David Attenborough

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# Research strengths

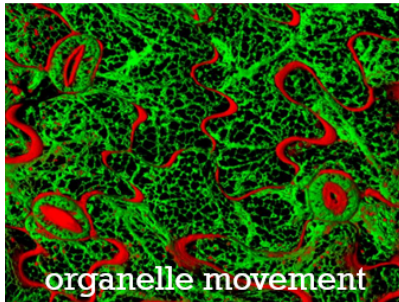


Evolutionary Biology

Plants and Agricultural Sciences

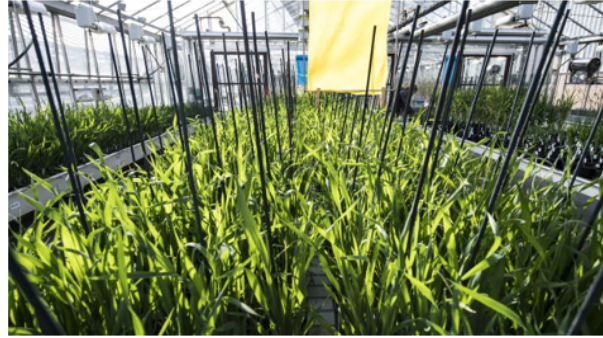
Ecology and Environmental Change

Animal Behaviour and Sensory Biology





# Animals, plants and microbes.....



....not human biology focused!

# Our degree courses

## Single honours BSc in

- Biology or
- Zoology
- Plant Sciences

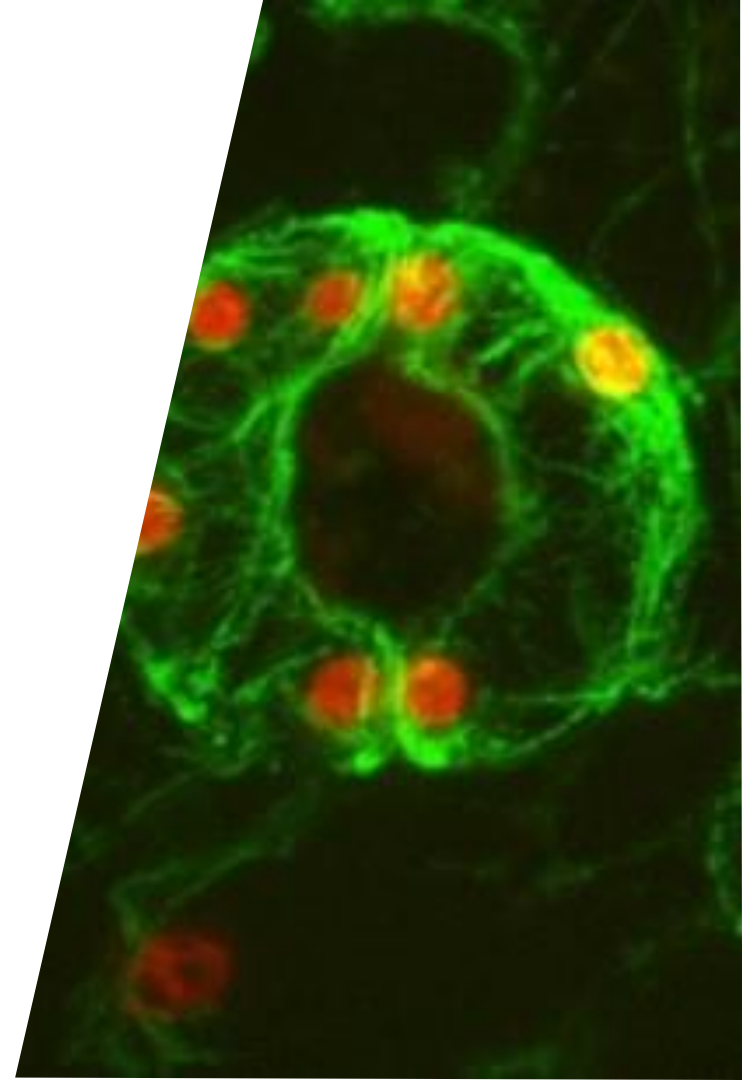
## Single honours MSci in

- Biology or
- Zoology
- Plant Sciences
- You can transfer on results day if you do better than expected
- The MSci now becoming the degree of choice for researchers

## Postgraduate programmes:

- MSc and PhD by Research

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# BSc course structure

Year 1	Year 2	Year 3
<i>120 credits</i>	<i>120 credits</i>	<i>120 credits</i>
Diversity of Life 1A	Quantitative Methods	Field/lab course report
Diversity of Life 1B	Science & Success	Literature review
	Evolutionary Biology	
Life Processes 1A	Molecular Genetics	Practical project
	Computational Biology	
Life Processes 1B	Optional unit	Optional unit
	Optional unit	Optional unit
Key Concepts	Optional unit	Optional unit
	Optional unit	Optional unit
Optional unit(s)	Optional unit	Optional unit
	Optional unit	Optional unit

# MSci course structure

Year 1	Year 2	Year 3	Year 4
<i>120 credits</i>	<i>120 credits</i>	<i>120 credits</i>	<i>120 credits</i>
Diversity of Life 1A	Quantitative Methods	Field/lab course report	Professional Development
Diversity of Life 1B	Science & Success	Literature review	Experimental Design & analysis
	Evolutionary Biology		
Life Processes 1A	Molecular Genetics	Advanced Practical Skills	Project Planning
	Computational Biology		
Diversity of Life 1B	Optional unit	Optional unit	Research project
	Optional unit	Optional unit	
Key Concepts	Optional unit	Optional unit	
	Optional unit	Optional unit	
Optional unit(s)	Optional unit	Optional unit	
	Optional unit	Optional unit	

# Year one teaching structure

- Each of the year one units in Biological Sciences is taught using a mixture of lectures and practical classes (usually three 50 minute lectures and one practical class per week)
- Optional units are diverse with a similar workload
- In parallel with this is a programme of fortnightly tutorials providing small group teaching
- You should expect to study ~40 hours per week



# Year one

The year one course is the same for all Biology, Zoology and Plant Science students

You will study three units at any one time

20 credits: Biology 1A Diversity of Life

20 credits: Biology 1B Diversity of Life

20 credits: Biology 1A Life Processes

20 credits: Biology 1B Life Processes

20 credits: Key concepts for Biologists

You will also study

20 credits: optional unit(s) in or outside the School

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# What will my first few weeks be like?

- Week one – Lab Inductions and Big Ideas in Biology Lectures
- Week two – Diversity of Life and Life Processes (lectures and lab)
- Week three – Field Trip: two-night trip to the Quantock Hills





# Field Trip: Quantock Hills

- Hands-on biology experience
- Building bonds with peers



# Biology: Diversity of Life

*course content:*

Evolution of biological diversity

Early life forms

Evolution of land plants

Evolution and diversity of invertebrates

Evolution and diversity of fungi

Evolution and exploitation of crops

Evolution and diversity of vertebrates

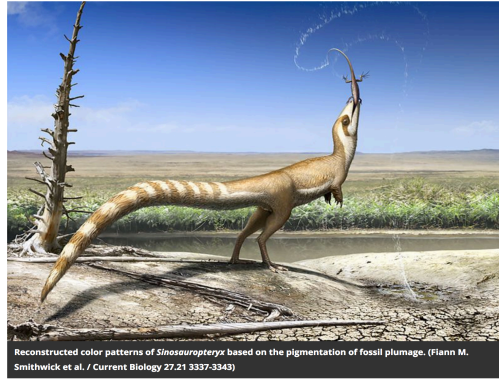
Evolution and diversity of mammals

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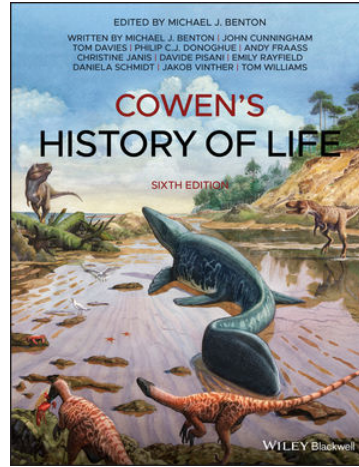
# Evolution and Diversity

Fossilized Pigments Reveal the Colors of Dinosaurs



Smithsonian Institute:  
one of the **top 10** scientific  
discoveries of the decade!

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Dr  
Jakob  
Vinther



Professor  
Mike  
Benton



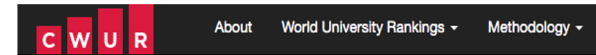
Professor  
Davide  
Pisani



Dr  
Tom  
Williams



Dr  
Jordi  
Paps



## PALEONTOLOGY

World Rank	Institution	Score
1	University of Bristol	100.00
2	University of Bremen	95.23
3	University of Alberta	91.57
4	Pierre-and-Marie-Curie University	90.89
5	Columbia University	90.54
6	Utrecht University	90.00
7	University of Cambridge	89.06
8	Claude Bernard University Lyon 1	87.88
9	University of Oxford	87.05
10	University of Montpellier	84.81
10	University of Toronto	84.81

# Biology: Life Processes

*course content:*

Membranes, macromolecules  
and metabolism

Animal physiology

Neurobiology

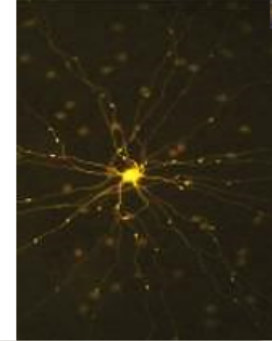
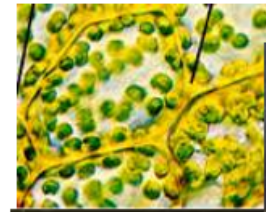
Animal development

Genetics

Environmental physiology

Ecology

Sensory Ecology





# Sensory Ecology



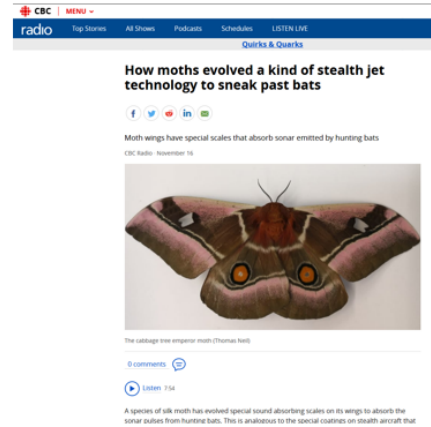
Dr Marc Holderied



BBC series *Super Senses*



BBC *Planet Earth II*





# Key Concepts for Biologists

## *course content:*

Designed to provide core skills

Direct link between lectures and  
small-group tutorials

Summaries of research papers

Oral presentations

Essays

Research reports



# Year one typical optional units



Current Topics in Biology

Introduction to Psychology (Psychology)

Sustainable Development (Geographical Sciences)

Microbes & Disease (Physiol & Pharmacol)

World in Crisis? (Geographical Sciences)

A foreign language

# Year two structure

## Single honours:

- There are five mandatory units
- You then choose six optional units  
plus a field course or lab workshop

*Choice of **optional** units is only constrained by Honours programme:*

<b>Biology:</b>	free choice from all units
<b>Zoology:</b>	at least 3 must be <b>animal-based</b> units
<b>Plants:</b>	at least 3 must be <b>plant-based</b> units

# Year two mandatory units



Quantitative Methods – 10CP

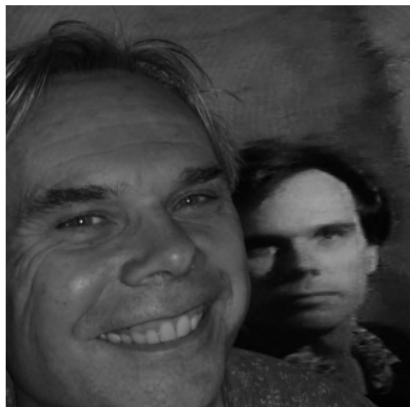
Science and Success: Transferable skills – 10CP

Molecular Genetics – 20CP

Evolutionary Biology – 10CP

Computational Biology – 10CP

# Evolutionary Biology



Professor Gareth Jones

## Scientists unlock the molecular secret behind long-lived bat species

Press release issued: 7 February 2018

Scientists have identified part of the molecular mechanism that gives long-lived bat species their extraordinary lifespans compared to other animals.

The study, co-authored by [Professor Gareth Jones](#) and Dr Roger Ransome from the University of Bristol's [Bat Ecology and Bioacoustics Lab](#), has been published today in the journal *Science Advances*.

The findings point to the protective structures at the end of chromosomes, called telomeres.

According to the international team of scientists, in the longest-lived species of bats (*Myotis*) telomeres don't shorten with age.

Whereas in other bats species, humans and other animals they do, causing the age-related breakdown of cells that over the course of a lifetime can drive tissue deterioration and ultimately death.

To conduct the study, researchers took 3-mm wing biopsies from some 500 wild bats from across four species that they captured, marked and released.

The samples were flash frozen in liquid nitrogen or desiccated using silica beads, high-molecular weight DNA was extracted, and change in telomere length was assessed.

Dr Nicole Foley from the University College Dublin, the lead author of the study, said: "Our results show that telomeres shorten with age in two of the bat species (*Rhinolophus ferrumequinum* and *Miniopterus schreibersii*), typical of most mammals.

"But in the longest-lived species of bats (*Myotis*), we did not detect any evidence that their telomeres shorten with age, contrary to all expectations."



The greater mouse eared-bat *Myotis myotis*  
Image credit: Oliver Farcy



The greater mouse eared-bat *Myotis myotis*  
Image credit: Oliver Farcy

### Share this article



### More news

[University of Bristol climbs Complete University Guide 2019 league table](#)  
25 April 2018

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24 April 2018

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24 April 2018

[New DNA screening pinpoints whose blood the vampire bat is drinking](#)  
23 April 2018

[Green and Black project helps Bristol's environmental sustainability movement become more diverse](#)  
23 April 2018

[Artist-in-residence opportunities for the new Temple Quarter Enterprise Campus](#)  
23 April 2018

[Two Bristol teams win prizes at BrisSynBio 4-Day MBA](#)  
23 April 2018

[New discipline accelerates shape-changing abilities for everyday objects](#)  
21 April 2018

[World-leading experts visit Bristol for Quantum Technologies workshop](#)  
20 April 2018

[Researcher makes a significant](#)



# Year two optional units (choose six)

BSc Biology – choice of all

Marine Ecology & Physiology

Conservation Biology

Sensory Biology

Cell & Developmental Biology

Plant disease

Ecology

Green Planet

Brains, Behaviour and Evolution

Acquisition of Behaviour

Behavioural Ecology

Insect Biology

# Year two optional units (choose six)

BSc Plant Science – at least 3 highlighted in green

Marine Ecology & Physiology

Conservation Biology

Sensory Biology

Cell & Developmental Biology

Plant disease

Ecology

Green Planet

Brains, Behaviour and Evolution

Acquisition of Behaviour

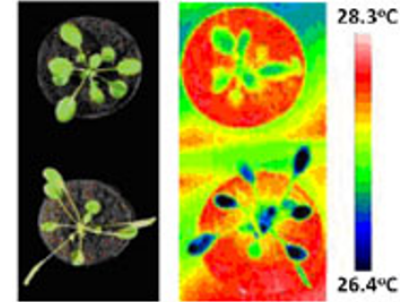
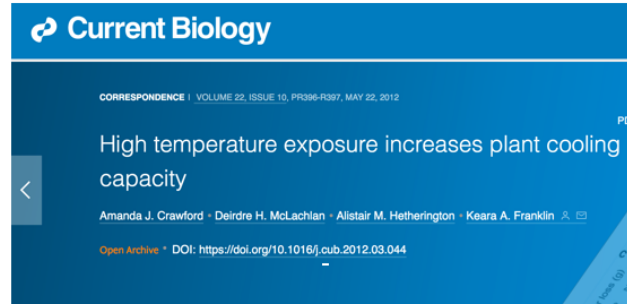
Behavioural Ecology

Insect Biology

# Green Planet



Professor  
Keara Franklin



## Science News

from research organizations

### How plants chill out: Plants elongate their stems to cool their leaves

Date: May 21, 2012

Source: University of Bristol

Summary: Plants elongate their stems when grown at high temperature to facilitate the cooling of their leaves, according to new research. Understanding why plants alter their architecture in response to heat is important as increasing global temperatures pose a threat to future food production.

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# Year two optional units (choose six)

BSc Zoology – at least 3 highlighted in green

Marine Ecology & Physiology

Conservation Biology

Sensory Biology

Cell & Developmental Biology

Plant disease

Ecology

Green Planet

Brains, Behaviour and Evolution

Acquisition of Behaviour

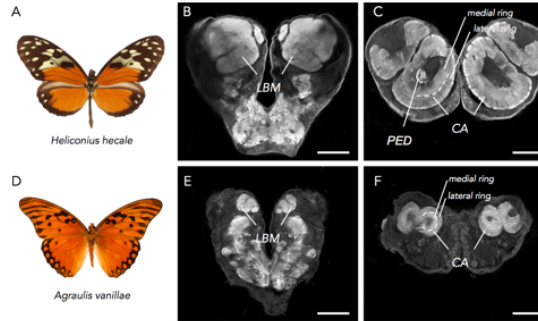
Behavioural Ecology

Insect Biology

# Brains, Behaviour and Evolution



Dr Stephen Montgomery



## Whales evolved large brains in the same way that we did



LIFE 18 September 2019

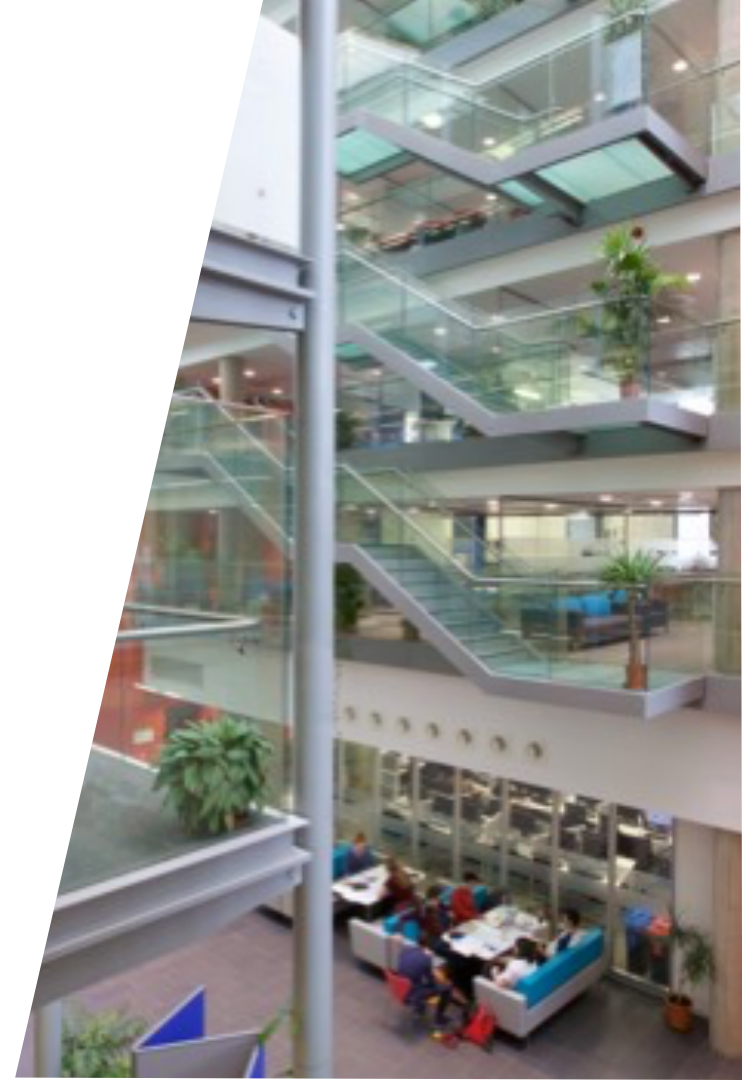
By Colin Barras



Whales and dolphins evolved large brains in the same way as primates

# Year two units

- Each typically involves:
  - 15 lectures
  - 9 hours practical work and/or discussion groups or independent research
  - a reading week



# Independent and group work





# Field courses and lab workshops

- Australia
- Costa Rica
- Portugal





# Field courses and lab workshops

- Scotland
- Pembrokeshire
- Lundy Island
- Bristol



# Field courses and lab workshops

Communicating science  
through film making



# Year three units

*Six units from...*

Social Evolution: Genes to Societies

Sex, Behaviour & Life Histories

Staying Alive: Predator-Prey Interactions

Communication and Cognition in Animal Societies

Plant Environmental Adaptation

Agricultural Biotechnology

Sensory Ecology

Ecology of Food Production

Plant Evolution & Diversity

Tree of Life

Oceans

Host-parasite interactions



*Plus:*

- Practical Project (BSc) (12 weeks, in pairs)
- Advanced Practical Skills (MSci)
  - Literature Review
  - Field Course or Lab Work

# Staying Alive: predator-prey interactions



Professor Innes Cuthill



Current Biology  
**Report**

## Iridescence as Camouflage

Karin Kjernsmo,<sup>1,4,\*</sup> Heather M. Whitney,<sup>1</sup> Nicholas E. Scott-Samuel,<sup>2</sup> Joanna R. Hall,<sup>2</sup> Henry Knowles,<sup>1</sup> Laszlo Talas,<sup>2,3</sup> and Innes C. Cuthill<sup>1</sup>

<sup>1</sup>School of Biological Sciences, University of Bristol, Bristol BS8 1TQ, UK

<sup>2</sup>School of Psychological Science, University of Bristol, Bristol BS8 1TU, UK

<sup>3</sup>Present address: Bristol Veterinary School, University of Bristol, Bristol BS40 5DU, UK

<sup>4</sup>Lead Contact

\*Correspondence: [karin.kjernsmo@bristol.ac.uk](mailto:karin.kjernsmo@bristol.ac.uk)

<https://doi.org/10.1016/j.cub.2019.12.013>

The Telegraph

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UK news World news Royals Health Defence Science Education Invest

News Science

Can you spot the beetle hiding in plain sight? Scientists find new camouflage technique





# Communication and Cognition in Animals

Dr Stephanie King



Professor Andy Radford



PHOTOGRAPH BY RALPH LEE HOPKINS

MAGAZINE | BREAKTHROUGHS

**Dolphins have unique whistles for their friends, and more breakthroughs**

**Current Biology**

Volume 28, Issue 12, 18 June 2018, Pages 1993-1999.e3



Report

**Bottlenose Dolphins Retain Individual Vocal Labels in Multi-level Alliances**

Stephanie L. King<sup>1,4,5,6,8,10</sup>, Whitney R. Friedman<sup>2,7</sup>, Simon J. Allen<sup>1</sup>, Livia Gerber<sup>3</sup>, Frants H. Jensen<sup>4</sup>, Samuel Wittwer<sup>2</sup>, Richard C. Connor<sup>5</sup>, Michael Krützen<sup>3</sup>

**Tweets going viral: birds can 'learn second language' from peers**

**The Australian fairy wren can master the meaning of a few key 'words' by listening to other species**



▲ A fairy-wren. Scientists have discovered that birds can learn to recognise alarm calls of other species, essentially by learning to eavesdrop on a second language. Photographs: Jessica McLachlan/JAP

**Birds can learn a second language by listening to the tweets and chirps of other birds, helping them to find out when a predator is approaching, scientists have found.**

**Current Biology**

Volume 28, Issue 16, 20 August 2018, Pages 2632-2637.e4



Report

**Birds Learn Socially to Recognize Heterospecific Alarm Calls by Acoustic Association**

Dominique A. Pövin<sup>1,3</sup>, Chaminda P. Ratnayake<sup>1</sup>, Andrew N. Radford<sup>2</sup>, Robert D. Magrath<sup>1,4,5,8,10</sup>

# Year four: the MSci

- A four year undergraduate course
- The focus is training for biological research
- Like a BSc+MSc, gives you an edge for:
  - PhD research
  - Highly competitive jobs
- You can switch between MSci and BSc if your goals change (BSc to MSci switch conditional on good performance in years one to three)



# Teaching specialists

**Top class teaching** by world-leading researchers

Dedicated *Scholarship of Teaching and Learning* team, i.e. the **teaching specialists**



Dr. Andy Wakefield  
*Lectuer*



Dr. Emily Bell  
*Lecturer*



Dr. Bex Pike  
*Lecturer*



Dr. Kathryn Ford  
*Lecturer*



Dr. Daniela Dietrich  
*Lecturer*



Dr. Dave Lawson  
*Lecturer*



*"SoTL can be described as a movement, a revolution, a tool or framework; we see it as a gateway to teaching excellence. Our mission is to develop a culture of educational scholars, to encourage innovation and implementation of effective practices that support excellent teaching, learning and assessment. These core principles are central to all staff that work in the department, but particularly to our SoTL team of teaching-focused lecturers."*

— DR. ROSE MURRAY, ASSOCIATE  
DIRECTOR OF TEACHING AND  
LEARNING

# Award winning teaching



2017 Winner: Dr Rose Murray

who  
inspires  
you?



Make your nomination in the  
**Bristol Teaching Awards**



2018 Winner: Prof. Gary Foster



# Bristol Futures

Innovation and enterprise  
Sustainable futures  
Global citizenship

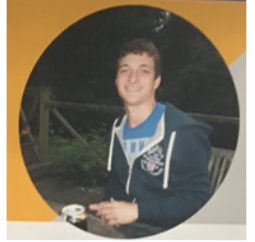
Bristol Futures is an exciting initiative that enhances our students' experience. Through a range of innovative learning resources and extracurricular activities, it provides the opportunity for the development of core academic skills and key personal attributes to help our students become adaptable, successful graduates.



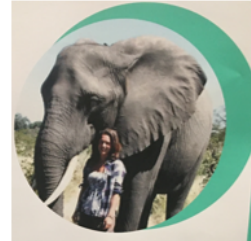
# Future careers

## Employment Sectors:

- Education
- Research
- Health and Social Work
- Finance and Insurance
- Accounting and Management Consultancy
- Other professional, scientific and technical activities
- Media



Project Manager –  
UK Research and Innovation



Producers –  
BBC Natural History Unit



Lawyer –  
Friends of the Earth

# Why choose Bristol?

- State of the art facilities, housed in the £56m Life Sciences building
- 91% of our BSc students were satisfied with course quality (DiscoverUni)
- Top 10 UK university (QS World Rankings 2020)
- We're in the top five universities targeted by top employers for the fifth year in a row (High Fliers report 2020)

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