



**The 66<sup>th</sup> Symposium on Vertebrate  
Palaeontology and Comparative  
Anatomy**

**Universities of Manchester**

**September 5<sup>th</sup>-8<sup>th</sup>**

**Final Circular**

**Registration has now closed for SVPCA. We have had over 130 registrations from the UK, Ireland, Canada, USA, Portugal, Spain, France, Belgium, Germany, Denmark, Norway, Sweden, Switzerland, Italy, Hungary, Australia, South Africa and Brazil.**

**In this final circular you can find details of the event, including schedule of events, travel and accommodation, fieldtrip and workshop. We look forward to seeing you all there. In the mean time, keep updated via our Facebook group, Twitter (@SVPCA\_Manc), and our website [www.svpca.org](http://www.svpca.org).**

### **Sponsorship**

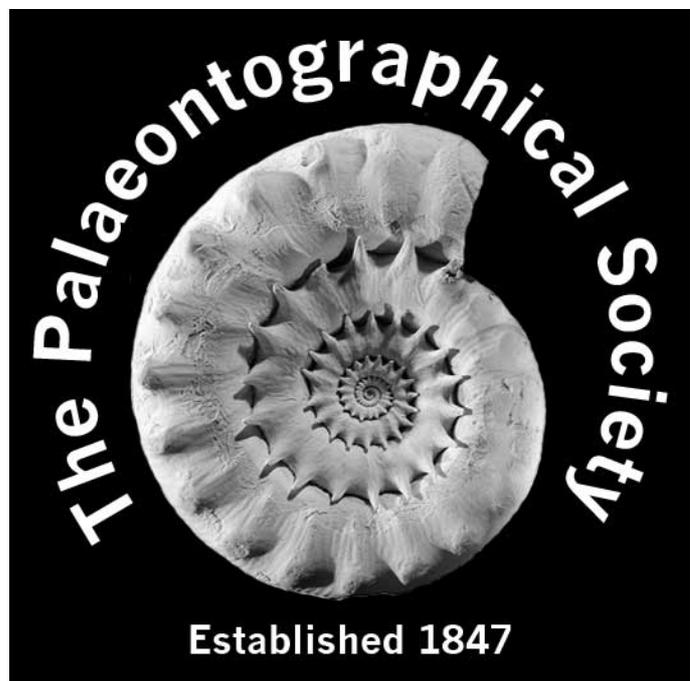
Many thanks to the Palaeontographical Society and PLOS ONE.

The **Palaeontographical Society** is a historic body that exists for the purpose of figuring and describing British fossils by publishing monographs. Benefits of membership include receipt and access to high quality monographs. They also have annual prizes for and funding for palaeontological research.

[www.palaeosoc.org](http://www.palaeosoc.org)

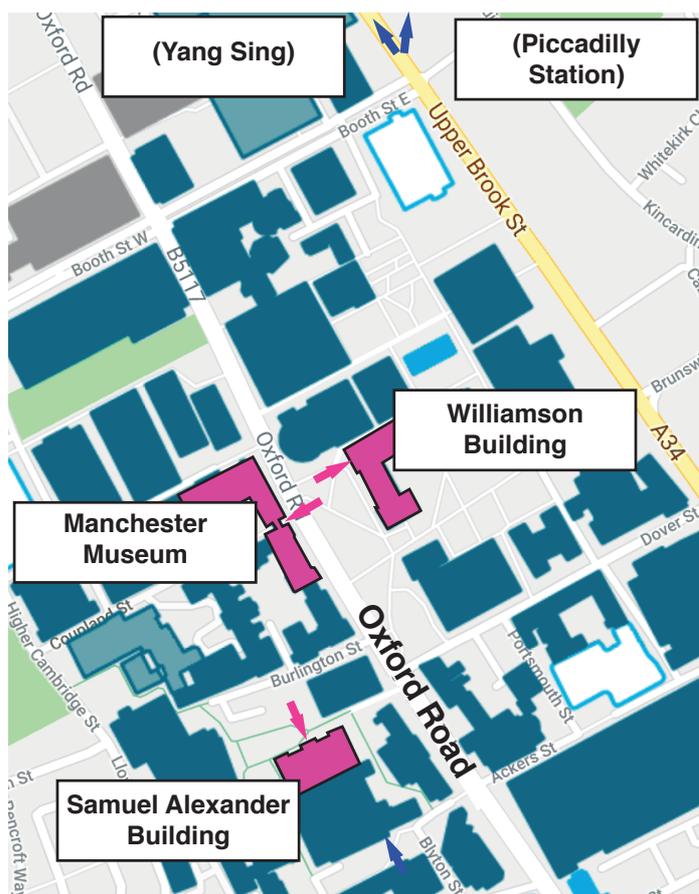
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## Meeting Venue and Travel

SVPCA and SPPC will take place at the University of Manchester Oxford Road Campus. Oral sessions will take place at the Samuel Alexander Lecture Theatre in the Samuel Alexander Building (M13 9PP, map below). Registration and tea breaks will take place in the foyer of the same building. The workshop, poster session, and annual auction will take place in the Williamson Building (map below). Step free access to the Samuel Alexander Lecture Theatre is to the rear (purple arrow in the map). The main campus is a short walk (1 mile) or bus ride (#147) from Manchester Piccadilly railway station, which



has frequent trains to Manchester Airport. The welcome reception is being held at the fossil galleries of Manchester Museum and the annual dinner is being held at Yang Sing in Manchester's historic China town (34 Princess Street, M1 4JY).

## Accommodation and Facilities

There are a number of hotels within short walking distance, including the Pendulum Hotel, Macdonald Manchester Hotel, and Ibis Manchester; all three still have rooms available at the time of writing. Oxford road has plenty of eating and drinking establishments available. Lunch is not provided to delegates, but we recommend Kro bar (Oxford Road) for those wanting a sit down lunch, or just south on Oxford Road is a Sainsbury's local, Costa Coffee, and a Subway. Each evening has social events, but for after we recommend either Kro bar again, Big Hands (Oxford Road) or Sandbar (Grosvenor Road). You will likely find the local hosting committee at one of these after hours! For evening meals, Manchester's famous "Curry Mile" is a short walk (0.6 miles) south of the University Campus and has no shortage of options.

## Programme and Abstract Volume

A brief outline of the programme can be found below. The full line-up, including talk and poster titles, is at the end of this document. An electronic abstract volume will be made available shortly before the conference. A hard copy of the schedule of events will be available on registration, but to reduce waste we will not be printing hard copies of the abstract volume. Instructions for oral and poster presentations will be emailed to presenters.

	Wednesday 5th	Thursday 6th SVPCA sessions	Friday 6th SVPCA sessions	Saturday 7th Fieldtrip
9.00	Registration	Ahlberg	Moreno-Azanza	Coach from Oxford Road to Buxton
9.15		Clack	Atterholt	
9.30	Bayesian	Castiello	Maharaj	
9.45	SPPC Workshop	Cupello	Martin-Silverstone	
10.00	Larkin	Dobson	Unwin	Buxton museum including guided tour of Pleistocene mammal collections
10.15	Smith	Dearden	Bestwick	
10.30	Nunn	Tea		
10.45	Tea	Tea		
11.00		Chiarenza	Bullar	
11.15	Forrest	Brocklehurst	Chatterji	
11.30	Graham	Maidment	Jones	
11.45	Henderson	Butler	Lomax	
12.00	Carrio			
12.15	Open			
12.30		Lunch Break	Lunch Break	Lunch (Old Sun Inn)
12.45				
13.00	Lunch Break			
13.15				
13.30		López-Arbarello	Brocklehurst	
13.45	Special Symposium	Callender-Crowe	Troelsen	
14.00	SVPCA Intro	Sookias	Marek	Poole's Cavern tour
14.15	Coates	Beck	Sharp	
14.30		Lloyd	Karoullas	
14.45	Davis	Tea		
15.00			Tea	
15.15	Giles	Regalado		
15.30		Barrett	Henderson	
15.45		Johnson	Clements	
16.00	Tea	Mannion	Wallace	
16.15	Asher	Armfield	Zhang	Return Coach
16.30			MacLaren	
16.45	Randle		Lautenschlager	
17.00		Poster Session		
17.15	Rauhut			
17.30				
17.45				
18.00				
18.15				
18.30	Museum Reception	Annual Auction	Conference Dinner	
18.45				
19.00				

## **SPPC**

The Symposium of Palaeontological Preparation (SPPC) will take place on the morning of Wednesday 5<sup>th</sup> in the Samuel Alexander Theatre. It will finish with a short open session during which people are encouraged to bring along fossil material they would like to present or discuss. Please email [Cindy.Howells@museumwales.ac.uk](mailto:Cindy.Howells@museumwales.ac.uk) if you would like to participate. The SPPC is supported by the Geological Curators Group (GCG).

### **Workshop: *Introduction to Bayesian phylogenetic analysis for palaeontologists***

Led by Robin Beck (Salford), with assistance from Graeme Lloyd (Leeds), and Joe Keating (Manchester) this workshop will provide an introduction to the principles underlying Bayesian phylogenetic analysis of palaeontological (morphological) data, and how such analyses can be implemented using the widely-used program MrBayes. Topics covered will include the Lewis model for morphology and its variants, model fit/comparison with Bayes factors, MCMC and how to determine stationarity and convergence between chains, and tip-dating for inferring divergence times. Participants should bring their own laptops, and should have downloaded MrBayes 3.2.6 (available here: <https://github.com/NBISweden/MrBayes/tree/v3.2.6>). They will also need a simple text editor for editing input files (e.g. Notepad in Windows, TextEdit in macOS). Example datasets will be provided, but participants are encouraged to bring their own: ideally, these should be in NEXUS format, with an estimated age (either a point estimate or age range) for each taxon, and for the age of the root node. The workshop is now at capacity. Thanks to those who registered.

### **Special Symposium: *Advances in the Vertebrate Tree of Life***

The afternoon of first day of the meeting will feature a special symposium on “Advances in the Vertebrate Tree of Life” with invited speakers from the UK and abroad giving extended talks (30 minutes) that highlight the cutting edge advances that fossils have made in understanding vertebrate phylogeny. Scheduled speakers include Robert Asher (Cambridge), Michael Coates (Chicago), Katie Davis (York), Sam Giles (Oxford), Emma Randle (Bath), Oliver Rauhut (Munich). Details can be found below.

### **Welcome Reception**

The icebreaker reception will follow the special symposium. It will start at 18.00, Wednesday 5<sup>th</sup>, in the fossil galleries of the Manchester Museum. It is open to all registered delegates – beer, wine soft drinks, and snacks will be provided.



*Manchester Museum*

### **Poster Session**

Posters will be presented during the dedicated poster session (16.30 -18.00 of Thursday 6<sup>th</sup>), during which we ask presenters to be in attendance. This will take place in G12 of the Williamson building, just across the road from the Samuel Alexander Building. For logistical reasons **posters will be on display for this day only**, so we ask delegates to please attend the dedicated poster session. Snacks, wine, beer, and other refreshments will be provided.

### **Annual Auction**

The annual auction will immediately follow the poster session, starting at 18.00 in the Williamson Building (G03 lecture theatre). Proceeds of the auction will go the Jones-Fenleigh Fund, to support future SVPCA and SPPC attendance by those without institutional funding. Please do think of things you have to donate, be they specimen replicas, books, monographs, artwork, clothing, toys – anything will be gratefully received! Please bring your items to the registration desk or post them in advance to Robert Sansom.

**Unfortunately the lecture theatre will not be able to accommodate all delegates. Places will be allocated on a first-come first-served basis to delegates who email [SVPCAMAN2018@listserv.manchester.ac.uk](mailto:SVPCAMAN2018@listserv.manchester.ac.uk).**

### **Annual Dinner**

The annual dinner will take place at the award winning Yang Sing in Manchester's historic China town. It can be found at 34 Princess Street (M1 4JY). This is a short walk (1 mile) from the conference venue. Simply head

north on the A34 (Upper Brook St), which becomes Princess Street. Please arrive at 18.30 for dinner at 19.00. The event has proved quite popular and is now at full capacity – thank you to those who already registered for this event.

### **PLOS ONE Student Presentation Prizes**

Following the generous support of PLOS ONE, cash prizes will be awarded to the best student talk and the best student poster (£100 each). The prize will be judged by a committee of members of the SVPCA steering group, and winners will be announced at the annual dinner.

### **Fieldtrip – Saturday September 8th**

The ‘field’ trip this year will begin with a morning visit to the recently refurbished Buxton Museum and Art Gallery. Here we will have an opportunity to view the new galleries, including the ‘Wonders of the Peak’, and will also be given a guided tour of the palaeontology stores, housing the important archive and collections of the Victorian ‘Cave Hunters’ Sir William Boyd Dawkins and Dr J. Wilfred Jackson. Lunch will be taken at a local pub after which we will walk the short distance to Poole’s Cavern, where we will have a guided tour underground into the spectacular caves and caverns. This natural cave in Carboniferous Limestone, was occupied from the late Neolithic Period, and was opened as a showcave in 1853. Coach leaves Oxford Road at 9.00 and returns to Manchester for 17.00. The cost of the field trip (£30) will cover coach travel to and from Manchester, as well as admission to the Museum and Cavern. This event is open to late registrations – anybody wishing to attend should email [john.nudds@manchester.ac.uk](mailto:john.nudds@manchester.ac.uk) before August 17<sup>th</sup>.

### **Social Media**

The official hashtag for the meeting is #SVPCA2018, and we encourage people to discuss the meeting and talks on social media. Our default assumption is that discussions of presentations on social media are allowed. However, please respect any request by an author not to disseminate the contents of their talk or poster. Authors should use a “no tweeting” symbol on their slides or posters to clearly express that they do not want their presentation posted or discussed online.

### **Contact**

If you have questions, you can email [Robert.sansom@manchester.ac.uk](mailto:Robert.sansom@manchester.ac.uk) and [SVPCAMAN2018@listserv.manchester.ac.uk](mailto:SVPCAMAN2018@listserv.manchester.ac.uk).

## Host Committee

Robert Sansom (Chair, UoM), Robin Beck (UoS), Charlotte Brassey (MMU), Robert Brocklehurst (UoM), Leah Callender-Crowe (UoM), Joe Keating (UoM), Dean Lomax (UoM), John Nudds (UoM), Elseph Wallace (UoM) University of Manchester (UoM), University of Salford, and Manchester Metropolitan Museum (MMU).

## SVPCA Steering Committee

Richard Butler, Susannah Maidment, Robert Sansom, Richard Forrest, Martin Nunn, Cindy Howells, Emma Dunne, Graeme Lloyd, Jeff Liston.

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# FULL SCHEDULE OF ORAL PRESENTATIONS

## WEDNESDAY September 5th

### Symposium of Palaeontological Preparation and Conservation (SPPC)

Chair Cindy Howells

- |       |  |  |
|-------|--|--|
| 10.00 | <b>Nigel Larkin</b>                                | The Biddulph Grange geology gallery project: restoring a unique display from 1862 that encapsulates an important stage in the history of the development of geological thinking. |
| 10.15 | <b>Adam Smith</b>                                  | From China to Nottingham: the making of Dinosaurs of China   |
| 10.30 | <b>Martin Nunn</b>                                 | Using theatre skills in a science exhibition: Dinosaurs of China in Nottingham   |
| 10.45 | <i>Tea Break (Samuel Alexander Building Foyer)</i> |  |
| 11.15 | <b>Richard Forrest</b>                             | Challenging preparation of a plesiosaur skeleton from a stressed nodule  |
| 11.30 | <b>Mark Graham</b>                                 | The air-abrasive technique: re-evaluation of its use in fossil preparation   |
| 11.45 | <b>Don Henderson</b>                               | Rescuing an Early Cretaceous plesiosaur from an active tar sand mine   |
| 12.00 | <b>Vicen Carrió</b>                                | An introduction to “The Association for Materials and Methods in Palaeontology” (AMMP) meeting.  |
| 12.15 |  | SPPC open session  |
| 12.30 | <i>Lunch Break</i>                                 |  |

## Special Symposium "Advances in the Vertebrate Tree of Life"

Chair Robert Sansom

- 14.00 SVPCA opening remarks
- 14.15 **Mike Coates** Sharks uprooted - new perspectives on early chondrichthyans
- 14.45 **Katie Davis** Shaping the avian (super)tree of life
- 15.15 **Sam Giles** Unravelling osteichthyan relationships: evolutionary tales from the head of forgotten fishes.
- 15.45 *Tea Break (Samuel Alexander Building Foyer)*
- 16.15 **Rob Asher** Confidence in palaeontological systematics: lessons from mammals
- 16.45 **Emma Randle** Tackling jawless fish: continuous characters, rooting and patterns of evolution in Heterostraci
- 17.15 **Oliver Rauhut** Dinosaur origin and success in the early Mesozoic: insights from the distribution of homoplasy
- 18.00 **WELCOME RECEPTION** (*Fossil Galleries, Manchester Museum*)

## THURSDAY 6th September

SVPCA Session 1: 'Fishes' Chair Joseph Keating

- 9.00 **Per Ahlberg** An extremely primitive miniature tetrapod from The Late Devonian (Early Famennian) of North Timan, Russia
- 9.15 **Jenny Clack** *Acherontiscus*, the earliest durophagous tetrapod redux
- 9.30 **Marco Castiello** 3D investigation of the head and shoulder of a stenioellid fish reveals Stensioellida to be a valid group of placoderm-grade affinity
- 9.45 **Camilla Cupello** Lung evolution in osteichthyans: insights from synchrotron phase-contrast microtomography
- 10.00 **Claire Dobson** Cranial osteology of *Pachycormus*, and relationships and divergence times among pachycormiforms
- 10.15 **Richard Dearden** A third "acanthodian" stem-chondrichthyan endoskeleton in a uniquely well-preserved specimen of *Diplacanthus crassisimus*

10.30 *Tea Break (Samuel Alexander Building Foyer)*

### **SVPCA Session 2: Macroevolution and Palaeobiogeography**

Chair Graeme Lloyd

- 11.00 **Alessandro Chiarenza** Climatic drivers behind the demise of non-avian dinosaurs at the end Cretaceous mass extinction
- 11.15 **Neil Brocklehurst** Physical and environmental controls on Paleozoic tetrapod dispersal across Pangaea
- 11.30 **Susie Maidment** North Africa's first stegosaur and the armoured dinosaurs of Gondwana
- 11.45 **Richard Butler** Standardising for spatial sampling bias demonstrates constrained diversification of Phanerozoic terrestrial tetrapods
- 12.00 *Lunch Break*

### **SVPCA Session 3: Morphology and Molecules** Chair Sam Giles

- 13.30 **Adriana López-Arbarello** Non-random distribution of homoplasy and the definition of actinopterygian clades
- 13.45 **Leah Callender-Crowe** Evaluating the performance and correlation morphological characters in reconstructing avian and squamate evolutionary history
- 14.00 **Roland Sookias** Reconciling morphology and molecular data in inferring phylogeny for extant crocodylians
- 14.15 **Robin Beck** Improvements in the fossil record may largely resolve the conflict between morphological and molecular estimates of mammal phylogeny
- 14.30 **Graeme Lloyd** Meta-analytical integration of fossil and molecular data in phylogenetic inference and the first truly comprehensive phylogeny for Cetacea
- 14.45 *Tea Break (Samuel Alexander Building Foyer)*

### **SVPCA Session 4: Sauropsid Phylogeny** Chair Susie Maidment

- 15.15 **Omar Regalado** Impact of continuous character coding on the reconstruction of the evolutionary history of Basal Sauropodomorpha

- 15.30 **Paul Barrett** Those feathers won't stick: maximum likelihood modelling supports scales as primitive for Dinosauria
- 15.45 **Michaela Johnson** What is '*Steneosaurus*'? evolutionary relationships within Teleosauroidea (Crocodylomorpha, Thalattosuchia)
- 16.00 **Phil Mannion** New insights on the phylogenetic relationships and biogeographic history of eusauropod dinosaurs
- 16.15 **Roxanne Armfield** Cranial anatomy of the Palaeocene snake *Helagras prisciformis*; early implications for crown macrostomatan snakes

#### **SVPCA POSTER SESSION** (Williamson Building)

- 16.30- **All Poster** See abstract booklet for poster titles  
18.00 **Presenters**

18.00 **ANNUAL AUCTION** (Williamson Building)

## **FRIDAY 7th September**

### **SVPCA Session 5: Archosaur\* Anatomy** Chair John Nudds

- 9.00 **Miguel Moreno-Azanza** The crystallography of the alligatorid eggshell. Insights from the EBSD.
- 9.15 **Jessie Atterholt** A CT-based survey of supramedullary diverticula in extant birds
- 9.30 **Iyra Maharaj** A comprehensive description of *Endothiodon bathystoma* (Anomodontia, Therapsida), a dicynodont from the late Permian of the Karoo Basin of South Africa
- 9.45 **Liz Martin-Silverstone** A 3D reconstruction and mass estimation of a well-preserved pterosaur from Brazil
- 10.00 **Dave Unwin** A quantitative protocol for assessing the developmental stage of embryos and its implications for pterosaurs
- 10.15 **Jordan Bestwick** Reconstructing the dietary ecology of pterosaurs using quantitative 3D textural analysis of tooth microwear
- 10.30 *Tea Break* (Samuel Alexander Building Foyer)

### **SVPCA Session 6: Sauropsid Crania** Chair Paul Barrett

- 11.00 **Claire Bullar** Ceratopsian braincase morphology and palaeoneurology through ontogeny.
- 11.15 **Ray Chatterji** A quantitative analysis of cranial growth and evolution in sea turtles (Testudinata: Chelonioidea)
- 11.30 **Marc Jones** Brain structure supports interpretations of an active lifestyle in a small, iconic British dinosaur
- 11.45 **Dean Lomax** Odd narial features in *Ichthyosaurus* suggest the presence of salt glands
- 12.00 *Lunch Break*

### **SVPCA Session 7: Biomechanics and Functional Morphology**

Chair Charlotte Brassey

- 13.30 **Robert Brocklehurst** Modelling Avian Ventilation Mechanics with 3D Levers and Linkages
- 13.45 **Pernille Troelsen** Functional morphology and hydrodynamics of plesiosaur necks: Does size matter?
- 14.00 **Ryan Marek** An everyday tool: how the avian neck has adapted to (almost) every situation
- 14.15 **Alana Sharp** The role of soft tissues in a biomechanical model of the rat skull
- 14.30 **Carolina Karoullas** Estimating the Flight Capabilities of Fossil Birds from Extant Bird Data and Aerodynamic Theory
- 14.45 **Mariane Delaunay** Do birds have whiskers?
- 15.00 *Tea Break (Samuel Alexander Building Foyer)*

### **SVPCA Session 8: Taphonomy and Mammals** Chair Robin Beck

- 15.30 **Don Henderson** Sediments, skulls and squishing – taphonomic investigations of ceratopsian skull deformation
- 15.45 **Thomas Clements** Uncovering the impact of palaeogeography on vertebrate taphonomy: an investigation of the Mazon Creek Lagerstätte.

- 16.00 **Elsbeth Wallace** Community preservation within the Late Jurassic Morrison Formation, Western Interior, USA
- 16.15 **Hanwen Zhang** *Elephas recki*: the wastebasket?
- 16.30 **Jamie MacLaren** Walking with Unicorns - metacarpal morphology of the Rhinocerotidae
- 16.45 **Stephan Lautenschlager** Morphological convergence and functional diversification of sabre-toothed vertebrates
- 17.00 **END**
- 18.30 **CONFERENCE DINNER** (Yang Sing, 34 Princess Street, M1 4JY)

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## POSTER PRESENTATIONS

- Eduardo Ascarrunz** Algorithmically-assisted selection of ratio characters for the phylogenetic placement of fossils of geoemydid turtles
- Sue Beardmore** Sticky fish as an indicator of specific palaeoenvironmental conditions
- Emily Brown** The use of CT in discerning the life habits of the Early Triassic archosauriform, *Proterosuchus fergusi*
- David Button** A three-dimensional virtual reconstruction of the skull of the problematic Early Jurassic theropod *Coelophysis? kayentakatae*, and the importance of evaluating uncertainty in retrodeformation studies
- Hannah Byrne** Synchrotron microtomography analysis of coprolites from the Obrutschew Bjerg Formation, East Greenland
- Sandra Chapman** Compactor storage for vertebrate collections at the NHM
- Ewan Chipping** Taming the cow: how have humans influenced morphological variation in wild and domestic cattle from prehistory to the present?
- Emma Dunne** The Rise of Dinosaurs: Tetrapod diversity and climate during the Late Triassic
- Hugo Dutel** The biomechanical significance of the palatal fascia and quadratojugal ligament in the skull of the ornate monitor (*Varanus ornatus*)
- Richard Forrest** Vertebral proportions in plesiosaurs
- Struan Henderson** Morphological conservatism and slow evolution under a new porolepiform phylogeny

<b>Jesse Hennekam</b>	Insular gigantism in Mediterranean dormice
<b>Thomas Henton</b>	A mystery fossil from the Kimmeridge (Upper Jurassic) of Dorset, UK – the oldest urolith on record
<b>Emily Hunter</b>	Tests of masticatory convergence within hard-object feeding primates
<b>Megan Jacobs</b>	Walking in the shadows of giants: The small dental assemblage of the Early Cretaceous Kem Kem beds of Morocco, North Africa
<b>Zerina Johanson</b>	Microstructure and mineralogy in dental plates of the holocephalan chimaeroid <i>Harriotta raleaghae</i> : novel dentine and conserved patterning combine to create a unique chondrichthyan dentition
<b>Miranta Kouvari</b>	Evolution of functional morphology of the <i>Suncus etruscus</i> Corsican shrew's mandible: a story between climate, man and island
<b>Loredana Macaluso</b>	Morphology, taxonomy, and phylogenetic relationships of the Monteviale crocodylians (Oligocene, Italy)
<b>Stephan Spiekman</b>	A new Antarctic specimen of <i>Prolacerta cf. broomi</i> , its biogeographical implications and a revision of the taxon
<b>Euan Malpas</b>	The first Mosasaur (Reptilia: Squamata) remains from the Ulster White Limestone Group, Northern Ireland, and refinements to the Wastebasket taxon, ' <i>Mosasaurus gracilis</i> '.
<b>Robert Mansergh</b>	Global and regional sea-levels during the Late Cretaceous and the evolution and radiation of megaherbivorous dinosaurs
<b>Darius Nau</b>	Postcranial Osteology of a New, Juvenile Skeleton of <i>Plateosaurus</i> (Dinosauria: Sauropodomorpha) from Frick, Switzerland
<b>Tom Raven</b>	A Phylogenetic Supermatrix of the Armoured Dinosaurs
<b>Francesco Santini</b>	A macroevolutionary look at the history of fishes in coral reefs
<b>Tim Smithson</b>	Traquair's lungfish from Loanhead: dipnoan diversity and tooth plate growth in the late Mississippian
<b>Marton Szabo</b>	The Late Cretaceous (Santonian) ichthyofauna of Iharkút (Hungary), with a summary on the European Late Cretaceous continental fish faunas
<b>Lukardis Wencker</b>	Phylogenetic value of jaw elements of lacertid lizards (Squamata: Lacertoidea): a case study with material from the Oligocene of France
<b>Mark Witton</b>	Tyrannosaurid theropods: did they ever smile like crocodiles?

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