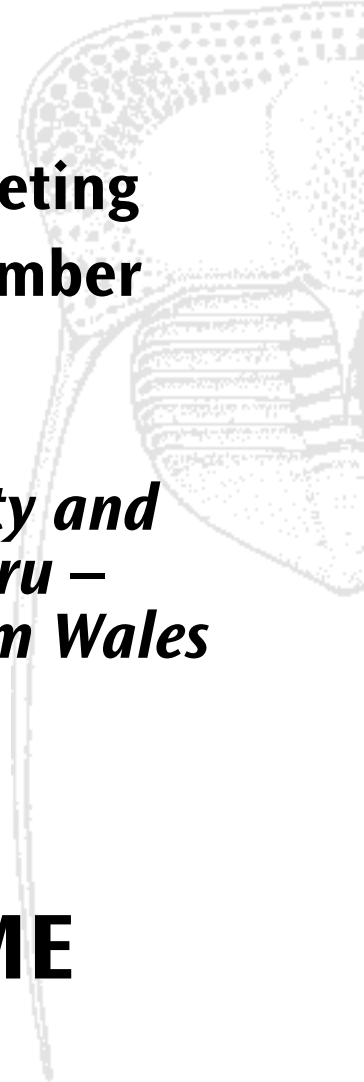


**The  
Palaeontological  
Association**

**59th Annual Meeting  
14th–17th December  
2015**

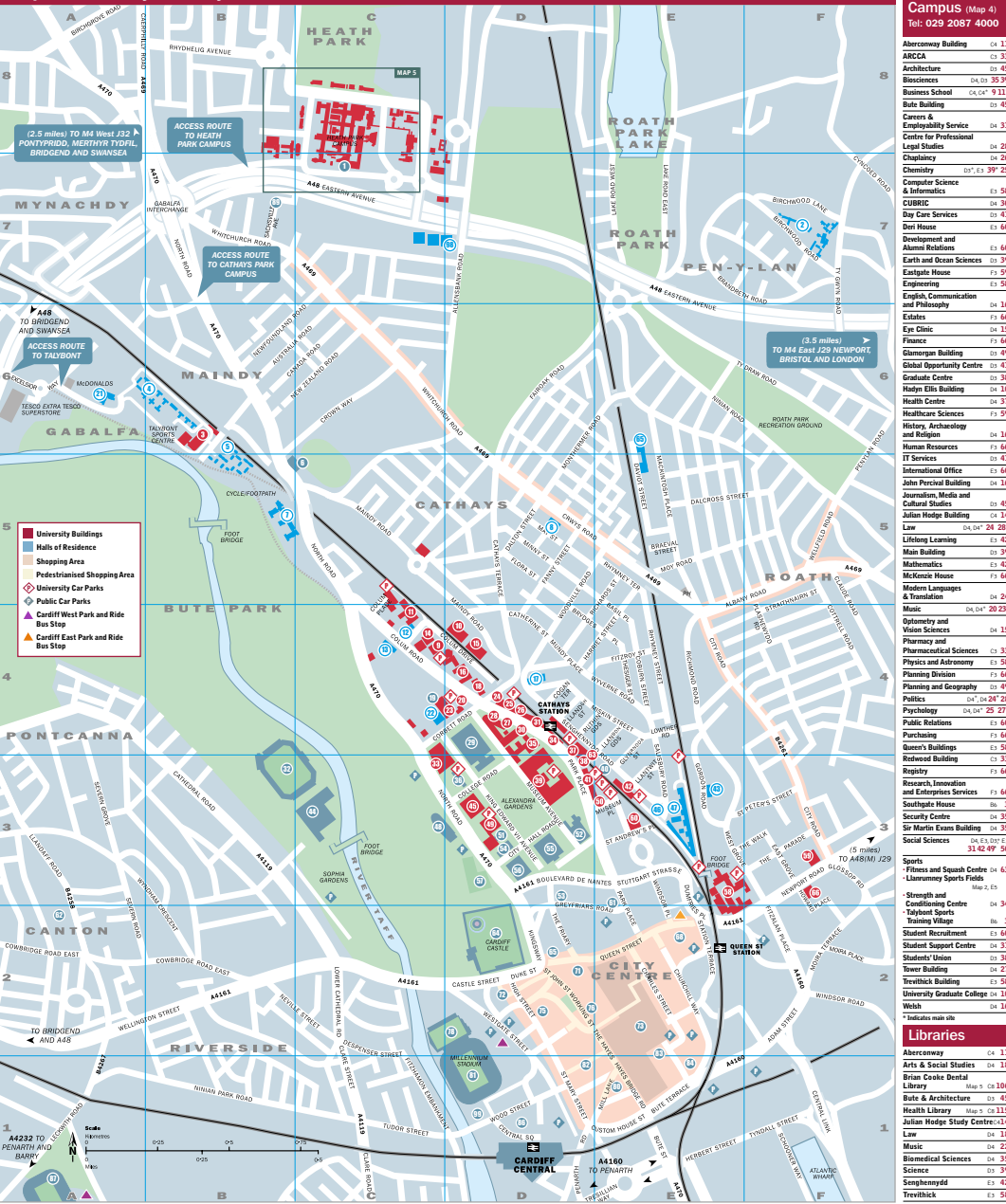
***Cardiff University and  
Amgueddfa Cymru –  
National Museum Wales***

**PROGRAMME**



# Map 4 University and City Centre

**Cathays Park Campus** (Map 4)  
Tel: 029 2087 4000



### Additional Information

All Nations Centre	87	89
British Council	03	53
Central Library	81	80
Central Police Station	03	54
City Hall	03	55
Coach Station	03	56
Law Courts	03	56
Metropolitan Arena	81	80
Post Office	03	55
Arcade	02	71
Royal Welsh College of Music and Drama	03	48
Temple of Peace	03	36
University of Wales Rhydolfa	03	61
Welsh Government Offices	04	29
Wessex Assembly	Map 2	97

Hospital	07	77
Emergency Hospital Accident and Urgency Unit	07	77
Cardiff Bay Visitor Centre	Map 2	96
Cardiff Castle	02	64
Dr Who Experience	Map 2	96
Llandaff Cathedral	Map 2	84
National Museum	03	52
Technique	Map 2	96
Theatres	03	61
New Theatre	83	87
Sherman Theatre	83	87
Chapter Arts Centre	A2	62
Cardiff RFC	03	57
Cardiff Tennis Club	03	57
Glamorgan County Cricket Club	83	32

Maindy Stadium/ Swimming Pool	02	76
St David's Hall	02	76
University Concert Hall	04	19
Witch Institute of Sport	03	49
Wales Millennium Centre	Map 2	96
Cinemas	02	76
Cineworld	02	83
Belem	Map 2	96
Vue	01	91
Sport	02	76
Athletic Stadium	Map 2	88
Cardiff Blues RFC	02	76
Cardiff City FC	A1	87
Cardiff RFC	02	76
Cardiff Tennis Club	03	57
Glamorgan County Cricket Club	83	32

Aden Street	F2	College Road	03	Gwynfryn Road	02	Mundy Place	04	St Mary Street	04
Albion Road	02	Colwyn Drive	04	Harriet Street	E4	Museum Avenue	02	St Peter's Street	04
Australia Road	04	Colwyn Road	04	High Bridge Road	E1	Museum Place	02	Station Terrace	04
Ba	06	Colwyn Road	04	Herbert Street	E1	Naville Street	03	Stanton Street	04
Baileys Road	02	Colwyn Road	04	Hill Street	E3	Newcastle Road	02	The Friary	02
Birchwood Lane	F7	Colwyn Road	04	Hill Street	E3	Newcastle Road	02	The Hayes	02
Branching Mill Lane	F8	Colwyn Road	04	Lower Castle Road	A2	North Road	02	The Parade	02
Branching Mill Lane	F8	Colwyn Road	04	Lower Castle Road	A2	North Road	02	The Quay	02
Branching Mill Lane	F8	Colwyn Road	04	Lower Castle Road	A2	North Road	02	The Quay	02
Branching Mill Lane	F8	Colwyn Road	04	Lower Castle Road	A2	North Road	02	The Quay	02
Branching Mill Lane	F8	Colwyn Road	04	Lower Castle Road	A2	North Road	02	The Quay	02

Castle Arcade	02	72
Central Market	02	75
Queen's Arcade	02	71
Queen's West	05	65
Royal Arcade	01	82
St David's Centre	02	72
Adrian Street	02	76
Albion Road	02	76
Australia Road	04	19
Ba	06	26
Baileys Road	02	76
Birchwood Lane	F7	26
Branching Mill Lane	F8	26
Branching Mill Lane	F8	26
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Branching Mill Lane	F8	26
Branching Mill Lane	F8	26

Cardiff Castle	02	72
Central Market	02	75
Queen's Arcade	02	71
Queen's West	05	65
Royal Arcade	01	82
St David's Centre	02	72
Adrian Street	02	76
Albion Road	02	76
Australia Road	04	19
Ba	06	26
Baileys Road	02	76
Birchwood Lane	F7	26
Branching Mill Lane	F8	26
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Branching Mill Lane	F8	26
Branching Mill Lane	F8	26
Branching Mill Lane	F8	26
Branching Mill Lane	F8	26

### Libraries

Abercromby Hall	04	11
Arts & Social Studies	04	18
Asian Specific Centre	04	11
Health & Architecture	04	35
Health Library	Map 5	115
Julian Hughes Study Centre	04	18
Law	04	22
Music	04	22
Biomedical Sciences	04	35
Science	03	39
Senghennydd	03	42
Trewhick	03	58

### Residences

Abercromby Hall	04	12
Aberdare Hall	04	22
Meeting Rooms	04	22
Central Library	04	18
Central Court	04	13
Colwyn Hall	03	43
Gordon Hall	03	43
Hodge Hall	04	17
Liberty House	03	42
Roz Jenkins Hall	03	42
Senghennydd Hall	03	47
Senghennydd Hall	03	47
Talbot Court	03	42
Talbot North	03	42
Talbot South	03	42
University Hall and Conference Centre	F7	2



35 Sir Martin Evans Bldg

39 Main Building

52 National Museum

55 City Hall



# The Palaeontological Association

## 59th Annual Meeting

### 14th–17th December 2015

#### Cardiff University and Amgueddfa Cymru – National Museum Wales

The programme for the 59th Annual Meeting of the Palaeontological Association is provided after the following summary of the Meeting. An abstract booklet including details of the AGM will be distributed at the Meeting.

#### Registration and booking

The final deadline for registration is **Friday 13th November 2015**. No refunds will be available after the final deadline. Registration and payment (by credit card) are via online forms available on the Palaeontological Association website (<<http://www.palass.org>>). Please note that any transactions will be in sterling (£:GBP). Accommodation must be booked separately (see below). The cost of registration is the same as last year and includes sandwich lunches on Tuesday and Wednesday, the icebreaker reception on Monday evening, full registration package and tea/coffee from Monday through to Wednesday. The Annual Dinner costs **£45**. It will be held at **Cardiff City Hall**, which is five minutes' walk from the University and the Museum. The evening will begin with a drinks reception followed by a three-course meal.

#### Oral presentations

All speakers (apart from the symposium speakers) will be allocated 15 minutes. You should therefore prepare a 12 minute talk to allow time for questions and switching between presenters. We will have a number of parallel sessions in adjacent theatres so timing will be especially important. All of the lecture theatres will have a single A/V projector linked to a large screen. All presentations should be submitted and checked the day before they are scheduled. Cardiff University is PC-based, so Mac-based presentations may cause problems, particularly if animations are included. If you are using a Mac please make sure your presentation is PC-compatible before you leave your institution. If we are oversubscribed with oral presentations, you will be offered the opportunity to present your work as a poster presentation. Preference will normally go to those in the early stages of their career.

#### Poster presentations

Poster boards will accommodate an A0-sized poster presented in **portrait** format. The boards will not be suitable for posters of this size in landscape format. Materials to fix the poster to the boards will be available at the meeting.



### **Venue and travel**

The Conference will take place at **Amgueddfa Cymru – National Museum Wales** and **Cardiff University**, which are both located at Cathays Park in the City Centre. All conference venues, including the Annual Dinner, are within a 5-10 minute walk of each other. Cardiff Central train station is a c. 20 minute walk.

Accommodation is available within walking distance of the University and the city centre.

### **Getting to Cardiff**

#### *By Train*

Cardiff Central Station is a c. 20 minute walk from the conference venues and close to many hotels. Booking early will get the best rail ticket prices, especially from London Paddington. From Cardiff Central Station, there is also a frequent train service which stops at Cathays Station (located on the Cathays Park Cardiff University campus). Rail services connect Cardiff with London, Bristol, Birmingham, Southampton, Manchester and Liverpool, as well as many other cities and towns.

#### *By Coach*

Cardiff is also served by regular coach services from towns and cities across the UK; these are often cheaper than trains. For information, see National Express Coaches (<[www.nationalexpress.com](http://www.nationalexpress.com)>) and Megabus (<[www.uk.megabus.com](http://www.uk.megabus.com)>). Please note that Cardiff Bus Station recently closed for renovation and all National Express coaches now arrive and depart from Sophia Gardens, a 20 minute walk to the conference venues.

Local bus services also operate from Cardiff Central Station (<[www.cardiffbus.com](http://www.cardiffbus.com)>)

#### *By Car*

There is limited parking around the University, and almost none on campus, so driving to meeting venues is not the best option. There is pay-and-display car parking available on Park Place and within the civic centre (along College Road, City Hall Road, King Edward VII Avenue and Museum Avenue) but this fills up very quickly, especially just prior to Christmas. This typically costs around £6/day, payment is by coin or debit/credit card. Charges for city centre multi-storey car parks vary considerably, up to £12 per day.

#### *By Plane*

Cardiff Airport is approximately 12 miles from the city centre. There are bus and train links to Cardiff city centre, as well as a taxi service (taxi fare to Cardiff city centre approximately £31). There are rail and bus links to Cardiff from other airports such as Bristol, Heathrow and Gatwick.

#### *Taxis*

Taxis can be found at the front of Cardiff Central Station and a number of other locations around the city centre.

### **Accommodation**

This needs to be booked separately. Cardiff has a wide variety of hotels, hostels and guest-houses at a range of prices, which can be booked through the usual on-line resources. Most of the well-known hotel companies are represented. It is recommended that delegates look for reviews and ratings such as those at <[www.tripadvisor.co.uk](http://www.tripadvisor.co.uk)> to decide which would suit them best. <[visitcardiff.com](http://visitcardiff.com)> also lists a number of providers of accommodation from budget to luxury.



City centre hotel examples:

- The Parc Hotel (Park Place)
- Hilton (Kingsway)
- Park Plaza (Greyfriars Road)
- Premier Inn Cardiff City Centre (Churchill Way)
- Best Western PLUS Maldron Hotel (St Mary Street)
- Holiday Inn (Castle Street)
- Angel Hotel (Castle Street)
- Travelodge (Queen's Street)
- Radisson Blue (Meridian Gate, Bute Terrace)

B&Bs:

There are large numbers of B&Bs on Cathedral Road near Cardiff Castle. You are advised to check their ratings on Trip Advisor or other review sites as they vary.

- Lincoln House Hotel (Cathedral Road)
- Jolyon's at No. 10 (Cathedral Road)
- Number 62 (Cathedral Road)
- Church Guest House (Cathedral Road)

Budget accommodation:

A brand new YHA Youth Hostel has opened in Cardiff city centre with parking and private rooms, close to the rail and coach stations. This is an approximately 30 minute walk from the conference venues. It has dorm rooms, en-suite double and family rooms ranging in price from £16.

There are four backpacker hostels in the City, details available at <[visitcardiff.com](http://visitcardiff.com)>:

- Bunkhouse Hostel (St Mary Street)
- Nomad Backpacker (Roath)
- The River House Backpackers (Riverside)
- NosDa Studio Hostel (Riverside)

### **Travel grants to student members**

The Palaeontological Association runs a programme of travel grants to assist student members (doctoral and earlier) to attend the Annual Meeting, in order to present a talk or poster. For the Cardiff 2015 meeting, grants of less than £100 (or the € equivalent) will be available to student presenters who are travelling from outside the UK. The actual amount available will depend on the number of applicants and the distance travelled. Payment of these awards is given as a disbursement at the Meeting, not as an advance payment. Students interested in applying for a PalAss travel grant should contact the Executive Officer, Dr Tim Palmer (e-mail <[palass@palass.org](mailto:palass@palass.org)>) once the organisers have confirmed that their presentation is accepted, and before **1st December 2015**. Entitle the e-mail "Travel Grant Request". No awards can be made to those who have not followed this procedure.

### **Cardiff**

Cardiff is the capital city of Wales with many cultural and entertainment attractions (see <<http://www.visitcardiff.com/>>). During the Conference, there will be a Christmas market in the centre of the city and ice-skating outside City Hall. There are many restaurants and bars in the city centre.



## *Schedule*

### **Monday 14th December: Symposium and icebreaker reception**

In the morning (09.00–12.00) prior to the start of the meeting, there will be a training workshop (funded by the Software Sustainability Institute) on the *SPIERS* software suite for tomographic reconstruction, led by Russell Garwood, Mark Sutton and Imran Rahman, in the **Main Building, Cardiff University, Palaeontology Lab. 2.14**.

The meeting will begin with a Symposium in the afternoon (at 13.00) in the **Reardon Smith Lecture Theatre at Amgueddfa Cymru – National Museum Wales**. Registration will be available from 12.00–18.00 at the entrance to the lecture theatre.

The theme of the Annual Symposium is ‘Palaeobiotic interactions’.

Following the Symposium there will be an icebreaker reception at 18.00 in the Main Hall of **Amgueddfa Cymru – National Museum Wales**, with the opportunity to look around the **Evolution of Wales Galleries** and the **Reading the Rocks: the Remarkable Maps of William Smith** exhibition.

### **Tuesday 15th December: Conference, AGM, Annual Address and Dinner**

The Conference will commence at **Cardiff University** at 08.45 with a full day of talks and posters, followed by the Association AGM (at 16.45) and the Annual Address (at 17.15) given by Prof. John Hutchinson (The Royal Veterinary College). The first, second and final sessions will be in Shared Lecture Theatre, E1.21 Sir Martin Evans Building. The parallel middle sessions will be in Large Shandon Lecture Theatre, -1.64 Main Building and Large Chemistry Lecture Theatre, 1.123 Main Building. Posters will be on display throughout the meeting in the VJ Gallery/Council Chamber, where tea breaks will be held.

In the evening there will be a reception (at 19.00) and the Annual Dinner (at 20.00) at **Cardiff City Hall**.

### **Wednesday 16th December: Conference**

The day will begin with a poster session (08.45–09.45) in the VJ Gallery/Council Chamber where tea, coffee and Welsh cakes will be served. Lectures will commence at 09.45 with parallel sessions in Large Shandon Lecture Theatre, -1.64 Main Building and Large Chemistry Lecture Theatre, 1.123 Main Building. The final session will be held in Large Shandon Lecture Theatre, -1.64 Main Building.

### **Thursday 17th December: Field-trip**

Price £30 including transport and lunch.

The field-trip starts at 09.00 from the front steps of the **Amgueddfa Cymru – National Museum of Wales**, returning to Cardiff by 17.30 with stops at the Museum and main railway station. The number of participants is limited to 45.

In the morning, the field-trip will visit classic Silurian carbonates of the Usk Inlier, and we will then take you to Blaenavon, a World Heritage Site. Lunch will be at Big Pit National Coal Museum with the opportunity to go 300 feet (91 m) underground with a miner-guide.



# Schedule of events and timetable of presentations

## Monday 14th December

### *SPIERS Training Workshop (funded by the Software Sustainability Institute)*

Russell Garwood, Mark Sutton and Imran Rahman.

N.B. Pre-register to participate – for details see

<[http://www.palass.org/modules.php?name=annual\\_meeting&page=40](http://www.palass.org/modules.php?name=annual_meeting&page=40)>.

09.00–12.00 Main Building, Cardiff University, Palaeontology Lab. 2.14

### *Thematic Symposium: “Palaeobiotic interactions”*

Reardon Smith Lecture Theatre, National Museum Cardiff

12.00–18.00 Registration

Underlined author denotes designated speaker

13.00–13.15 **Welcome from Dr Richard Bevins (Keeper of Natural Sciences) followed by logistical information**

13.15–13.55 **Competition and symbiosis on marine hard substrates in the fossil record**  
Paul D. Taylor

13.55–14.35 **Leaving no stone unturned: the feedback between biotic diversity and early diagenesis**  
V. Paul Wright and Lesley Cherns

14.35–15.15 **Fossil lichens**  
Rosmarie Honegger, Dianne Edwards and Lindsey Axe

15.15–15.45 Tea/coffee break

15.45–16.25 **Something ate my fossil: from anecdote to testing hypotheses**  
Elizabeth M. Harper

16.25–17.05 **Rooted in Earth history: the Devonian transition to a forested planet**  
Christopher M. Berry, William E. Stein, Peter Giesen, John E. A. Marshall and Honghe Xu

17.05–17.45 **Animal-animal and animal-microbial ecological interactions in ancient methane seep communities**  
Crispin T. S. Little

### *Reception*

Main Hall, National Museum Cardiff

18:00–20:00 **Icebreaker reception**





## Tuesday 15th December

### *Conference, Association AGM, and Annual Dinner*

Underlined author denotes designated speaker.

\*Candidates for the President's Prize are marked with an asterisk.

+Posters in Viriamu Jones (VJ) Gallery/Council Chamber, Main Building, Cardiff University.

08.00–08.40 Put up posters

#### Session 1 (Shared Lecture Theatre, E1.21 Sir Martin Evans Building, Cardiff University)

08.15–11.00 **Registration**

08.45–09.00 **Opening of the Annual Meeting** by Professor Hywel Thomas (Pro Vice-Chancellor Research, Innovation and Engagement) followed by logistical information.

09.00–09.15 **The Anthropocene biosphere**

Mark Williams, Jan Zalasiewicz, Peter K. Haff, Christian Schwägerl, Anthony D. Barnosky and Erle C. Ellis

09.15–09.30 **The grapes among the apes: implications of a new fossil record of the Vitaceae from the African Miocene**

\*Neil F. Adams, Margaret E. Collinson, Selena Y. Smith, Marion K. Bamford, Félix Forest, Panagiota Malakasi, Federica Marone and Dan Sykes

09.30–09.45 **Evidence for sexual dimorphism in the plated dinosaur *Stegosaurus mjosi* (Ornithischia, Stegosauria) from the Morrison Formation (Upper Jurassic) of Western USA**

\*Evan T. Saitta

09.45–10.00 **Tetrapodophis amplexus, a four-legged snake from the Early Cretaceous of Gondwana, and implications for the origins of snakes**

Nicholas R. Longrich, David M. Martill and Helmut Tischlinger

10.00–10.15 **Ancient spiders and salt lakes**

Paul A. Selden and Matt R. Downen

10.15–10.30 **"MISS" conceptions and misconceptions: microbial, abiotic and problematic sedimentary surface textures from the Archaean to the present**

Neil S. Davies, Alexander G. Liu and Martin Gibling

10.30–11.00 **Tea/coffee break and posters<sup>+</sup>** (VJ Gallery, Main Building, Cardiff University)

#### Session 2 (Shared Lecture Theatre, E1.21 Sir Martin Evans Building, Cardiff University)

11.00–11.15 **How big is a genus?**

Julia D. Sigwart, Keith D. Bennett and Mark Sutton

11.15–11.30 **A stable isotopic investigation of chemosymbiosis through geological time**

\*Edine Pape, Fiona L. Gill, Crispin T. S. Little and Robert J. Newton

11.30–11.45 **Silicified molluscs from the Vikinghøgda Formation, central Spitsbergen: systematic and palaeoecological significance**

\*William Foster, Silvia Danise and Richard Twitchett



- 11:45–12:00 **The radiation of plankton during the Bajocian: a Mesozoic pelagic revolution**  
\*[Nickolas J. Wiggan](#), James B. Riding and Nicholas J. Butterfield
- 12:00–12:15 **When fossils and living taxa agree on patterns of morphological evolution: a case study with Afrotheria**  
\*[Mark N. Puttick](#) and Gavin H. Thomas
- 12:15–12:30 **The Strawberry Bank Lagerstätte reveals insights into Early Jurassic life**  
[Michael J. Benton](#), Matt Williams, Andrew Ross and Matt Friedman

### VJ Gallery, Main Building, Cardiff University

- 12:30–13:30 **Lunch and posters\***  
*[Registration]*

### Session 3a (Large Shandon Lecture Theatre, -1.64 Main Building, Cardiff University; in parallel with Session 3b)

- 13:30–13:45 **Conodont-based, high-resolution, quantitative biochronology of the end-Permian mass extinction in South China**  
\*[Morgane Brosse](#), Hugo Bucher and Nicolas Goudemand
- 13:45–14:00 **Phylogenetic relationships of Heterostraci, agnathans on the gnathostome stem**  
\*[Emma L. Randle](#) and Robert S. Sansom
- 14:00–14:15 **The 100 million year journey to teleost supremacy**  
\*[John Clarke](#), Lauren Sallan and Matt Friedman
- 14:15–14:30 **The ecomorphological diversifications of Mesozoic marine reptiles**  
\*[Thomas L. Stubbs](#) and Michael J. Benton
- 14:30–14:45 **Phylogeny and macroevolution of crocodylomorphs**  
\*[Max T. Stockdale](#), Michael J. Benton, Mario Bronzati, Marco B. de Andrade and Gavin H. Thomas
- 14:45–15:00 **Evolutionary rates reveal mechanisms of axial body plan evolution in Sauropterygia**  
\*[Laura C. Soul](#) and Roger B. J. Benson

### Session 3b (Large Chemistry Lecture Theatre, 1.123 Main Building, Cardiff University; in parallel with Session 3a)

- 13:30–13:45 **Experimental taphonomy and the role of decay and preservation in determining the anatomy and diversity of Cambrian vertebrates**  
[Mark A. Purnell](#), Sarah E. Gabbott, Duncan J. E. Murdock and Peiyun Cong
- 13:45–14:00 **Unlocking the preservation pathways of Cambrian neural tissue**  
[Xiaoya Ma](#), Gregory D. Edgecombe, Xianggang Hou, Tomasz Goral and Nicholas J. Strausfeld
- 14:00–14:15 **The role of framboidal pyrite and sulfur cycling in Ediacaran taphonomy**  
[Alexander G. Liu](#)
- 14:15–14:30 **Clay-microbe interactions and implications for exceptional preservation**  
[Sean H. McMahon](#) and Derek E. G. Briggs



14:30–14:45 **Phosphatisation of soft-tissues: an integrated palaeontological and geochemical analysis of the Christian Malford Lagerstätte (Callovian, Middle Jurassic)**  
Phil R. Wilby, Mark A. Woods, Keith L. Duff, Greg D. Price, Mike J. Norry,  
John D. Hudson, Kevin N. Page, Roy G. Clements and Malcolm B. Hart

14:45–15:00 **How do marine microfossils get trapped in amber?**  
Leyla J. Seyfullah, Dennis Grabow and Alexander R. Schmidt

#### VJ Gallery, Main Building, Cardiff University

15:00–15:30 **Tea/coffee break and posters<sup>+</sup>**

#### Session 4 (Shared Lecture Theatre, E1.21 Sir Martin Evans Building, Cardiff University)

15:30–15:45 **A Cambrian greening of the terrestrial landscape**  
Paul K. Strother

15:45–16:00 **Cryptogamic ground covers as modern analogues of early terrestrial ecosystems**  
Ria L. Mitchell and Paul Kenrick

16:00–16:15 **Variations in wildfire activity driven by atmospheric oxygen changes across the Toarcian OAE**  
<sup>\*</sup>Sarah J. Baker, Claire M. Belcher, Stephen P. Hesselbo and Tim M. Lenton

16:15–16:30 **Hot and fiery or just hot? A global record of early Paleogene wildfire**  
<sup>\*</sup>Brittany E. Robson, Margaret E. Collinson, Walter Riegel, Volker Wilde,  
Andrew C. Scott, Erica M. Crouch, Elizabeth M. Kennedy, J. Ian Raine,  
Christian Dupuis, Carlos Jaramillo and Richard D. Pancost

16:30–16:45 **Break**

16:45–17:15 **Annual General Meeting (AGM)**

### *Annual Address*

#### Shared Lecture Theatre, E1.21 Sir Martin Evans Building, Cardiff University

17:15–18:15 **Computer modelling and simulation of extinct organisms: its utility and limitations for reconstructing the evolution of locomotor behaviour**  
John R. Hutchinson

### *Reception & Annual Dinner*

#### City Hall

19:00–20:00 **Reception**

20:00–23:00 **Annual Dinner**



## Wednesday 16th December

### Conference & Poster session

#### Session 5 (VJ Gallery/Council Chamber, Main Building, Cardiff University)

08:45–09:45 **POSTER SESSION\*** with tea/coffee & Welsh cakes

Sponsored by The Paleontological Institute & Frontiers in Earth Science

#### Session 6a (Large Shandon Lecture Theatre, -1.64 Main Building, Cardiff University; in parallel with Session 6b)

09:45–10:00 **The Mesoproterozoic Ruyang Group, China – a hotspot of early eukaryote biodiversity**

\*[Heda Agić](#), Małgorzata Moczydłowska and Leiming Yin

10:00–10:15 **New windows into the ecology and taphonomy of Ediacaran acanthomorphs**

\*[Peter W. Adamson](#) and Nicholas J. Butterfield

10:15–10:30 **A record of small carbonaceous fossils (SCFs) from the Ediacaran–Cambrian of Baltica: expanding the Burgess Shale-type taphonomic window**

\*[Ben J. Slater](#), Thomas H. P. Harvey, Romain Guilbaud and Nicholas J. Butterfield

10:30–10:45 **Ontogeny, preservation, and systematics of Palaeoscolecida (stem-Priapulida?) – is the diversity of the group drastically overestimated?**

\*[Emmanuel L. O. Martin](#), Rudy Lerosey-Aubril and Peter Van Roy

10:45–11:00 **Annelid fossil data reconcile morphological and molecular phylogenies**

\*[Luke Parry](#), Gregory D. Edgecombe and Jakob Vinther

11:00–11:15 **The curious case of *Rollinschaeta myoplana*: reconstruction of extensively phosphatized myoanatomy in extinct taxa**

\*[Paul Wilson](#), Luke Parry, Dan Sykes, Gregory Edgecombe and Jakob Vinther

#### Session 6b (Large Chemistry Lecture Theatre, 1.123 Main Building, Cardiff University; in parallel with Session 6a)

09:45–10:00 **Morphology of the jaw adductor complex across the cynodont–mammaliaform transition**

[Stephan Lautenschlager](#), Pamela Gill, Michael Fagan and Emily J. Rayfield

10:00–10:15 **On the difficulty of reconstructing hybodont dentitions based on isolated teeth**

[Gilles Cuny](#) and Stanislas Rigal

10:15–10:30 **Near-stasis in the long-term diversification of Mesozoic tetrapods**

[Roger B. J. Benson](#), Richard J. Butler, John Alroy, Philip D. Mannion, Matthew T. Carrano and Graeme T. Lloyd

10:30–10:45 **Dinosaur biogeographic structure and Mesozoic continental fragmentation: a network-based approach**

[Alexander M. Dunhill](#), Jordan Bestwick, Holly Narey and James Sciberras

10:45–11:00 **Remarkably preserved brain tissue ultrastructure in an Early Cretaceous iguanodontian dinosaur**

[David B. Norman](#), Martin D. Brasier, Alexander G. Liu, Laura Cotton, Jamie Hiscocks, Russell Garwood and David Wacey



11:00–11:15 **Camouflage patterns in an ornithischian dinosaur**

Jakob Vinther, Robert Nicholls, Stephan Lautenschlager, Gerald Mayr, Emily Rayfield and Innes Cuthill

**VJ Gallery, Main Building, Cardiff University**

11:15–11:45 **Tea/coffee break and posters\***

**Session 7a (Large Shandon Lecture Theatre, -1.64 Main Building, Cardiff University; in parallel with Session 7b)**

11:45–12:00 **An outstanding upper Katian (Upper Ordovician) fossil assemblage from Portugal (Buçaco, Central Iberian Zone): biostratigraphical and palaeobiogeographical significance**

\*Jorge Colmenar, Sofia Pereira, Artur A. Sá and Carlos M. da Silva

12:00–12:15 **Biostratigraphical review and palaeobiogeographical remarks on the trilobite genus *Lichas* Dalman, 1827**

\*Sofia Pereira, Artur A. Sá, M. Pires and Carlos M. da Silva

12:15–12:30 **Chitinozoan biozonation in the Arenig Series (Floian–lower Darriwilian stages) of Wales**

\*Chloé E. A. Amberg, Thijs R. A. Vandenbroucke, Stewart G. Molyneux, Jean-François Ghienne and Philippe Razin

12:30–12:45 **Using fossils and phylogenies to date the timing of key gene regulatory network innovations in echinoids**

\*Jeffrey R. Thompson, Elizabeth Petsios and David J. Bottjer

12:45–13:00 **Reconstructing Miocene neotropical palaeoenvironments: a case study from the palaeosols and ichnofossils of Cerdas, Bolivia**

\*Angeline M. Catena, Daniel I. Hembree, Beverly Z. Saylor and Darin A. Croft

**Session 7b (Large Chemistry Lecture Theatre, 1.123 Main Building, Cardiff University; in parallel with Session 7a)**

11:45–12:00 **On the origin of animals and biologically mediated flow**

Nicholas J. Butterfield

12:00–12:15 **How easy was the Ediacaran transition to large body size? Rangeomorph growth, development and complexity**

Jennifer Hoyal Cuthill

12:15–12:30 **Depositional and preservational environments of the Ediacara Member, Rawnsley Quartzite (South Australia): assessing the timing of ‘ferruginization’**

Lidya G. Tarhan, Noah J. Planavsky, Mary L. Droser and James G. Gehling

12:30–12:45 **TRiPS, SQS, ACE and Chaos; evaluating the accuracy and precision of species richness estimators in palaeobiology**

Jostein Starrfelt

12:45–13:00 **Differential speciation and extinction rates across space and through time: implications for the generation of latitudinal diversity gradients**

Erin E. Saupe, Huijie Qiao, Corinne E. Myers, Jorge M. Soberón, A. Townsend Petersen, Stephen J. Hunter, Joy S. Singarayer and Paul J. Valdes

**VJ Gallery, Main Building, Cardiff University**13:00–14:00 **Lunch and posters\*****Session 8a (Large Shandon Lecture Theatre, -1.64 Main Building, Cardiff University; in parallel with Session 8b)**14:00–14:15 **A new use for old pollen: reconstructing past solar irradiance using pollen chemistry**Phillip E. Jardine, Wesley T. Fraser, Barry H. Lomax and William D. Gosling14:15–14:30 **Estimation of taxonomic richness variation through geological times: a simulation approach**\*Corentin Gibert and Gilles Escarguel14:30–14:45 **What limits the morphological disparity of clades?**\*Jack W. Oyston, Martin Hughes, Peter J. Wagner, Sylvain Gerber and Matthew A. Wills14:45–15:00 **Ontogenetic stages in the basal Gondwanan eusauropod *Patagosaurus***\*Femke M. Holwerda, Oliver W. M. Rauhut and Diego Pol15:00–15:15 **The monophyly of Euparkeriidae and its implications for the rise of crown Archosauria**\*Roland B. Sookias15:15–15:30 **Earliest members of a ‘living fossil’ lineage indicate a late origin of modern ray-finned fish diversity**\*Sam Giles, Guang-Hui Xu and Matt Friedman**Session 8b (Large Chemistry Lecture Theatre, 1.123 Main Building, Cardiff University; in parallel with Session 8a)**14:00–14:15 **The eldonids: cryptic éminences grises of the Palaeozoic oceans**Breandán A. MacGabhann and John Murray14:15–14:30 **The morphology and affinity of the Cambrian “muscle worm”**Allison C. Daley, Emily M. C. Tilby, John P. Paterson, Diego C. Garcia-Bellido, Gregory D. Edgecombe and James B. Jago14:30–14:45 **Recent advances in lobopodian palaeobiology and evolution**Javier Ortega-Hernández14:45–15:00 **The Ordovician explosion in the designs of trilobite eyes**Brigitte Schoenemann and Euan N. K. Clarkson15:00–15:15 **Are solemyoids and ctenodontids related?**John C. W. Cope15:15–15:30 ***Evactinostella crucialis* – another weird and wonderful bryozoan**Eckart Håkansson, Marcus Key and Andrej Ernst**VJ Gallery, Main Building, Cardiff University**15:30–16:00 **Tea/coffee break** (take down posters)


**Session 9 (Large Shandon Lecture Theatre, -1.64 Main Building, Cardiff University)**

- 16:00–16:15 **Conservation palaeobiology of Chesapeake Bay oysters**  
Rowan Lockwood and Kristopher M. Kusnerik
- 16:15–16:30 ***Kalania pusilla*, an exceptionally preserved non-calcified alga with oldest documented gametophores from the lower Silurian (Aeronian, Llandovery) of Estonia**  
Oive Tinn, Viirika Mastik, Leho Ainsaar and Tonu Meidla
- 16:30–16:45 **Five new Tournaisian tetrapods: their sedimentology and palaeoenvironments**  
Carys E. Bennett, Jennifer A. Clack, Timothy Kearsey, Sarah J. Davies, David Millward, Tim R. Smithson, Marcello Ruta, Ben Otoo, John E. A. Marshall, Emma Reeves and Andrew Ross
- 16:45–17:00 **Latitudinal diversity gradients in Mesozoic non-marine turtles**  
David B. Nicholson, Paul M. Barrett and Patricia A. Holroyd
- 17:00–17:15 **Presentation by Lyon 2016 organising committee**
- 17:15–17:30 **Presentation of President's awards to oral and poster presenters: followed by closing remarks**

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## Abstract of Annual Address

The Annual Address will be given on Tuesday 15th December.

### **Computer modelling and simulation of extinct organisms: its utility and limitations for reconstructing the evolution of locomotor behaviour**

**Professor John Hutchinson**

*Structure & Motion Laboratory, The Royal Veterinary College, Hatfield, AL9 7TA, UK*  
<jhutchinson@rvc.ac.uk>

Considering that we cannot observe the behaviour of extinct organisms, and yet their derived or ancestral traits make them attractive scientific subjects, how can we test how certain behaviours evolved? Computational methods are maturing as an approach that complements classical methods such as anatomy, ichnology, morphometrics or analogies with living animals. With the rapid advance of 3D imaging technologies, it is easy to build realistic digital organisms and estimate biological parameters such as body mass. Once a computational model is made, it opens up opportunities for more sophisticated techniques from estimating joint ranges of motion to predictive dynamic simulations that generate novel behaviours. I discuss examples from our research on the evolutionary biomechanics of locomotion in vertebrates, including simple modelling approaches of how tetrapods first walked, more complex biomechanical modelling of how fast giant dinosaurs like *Tyrannosaurus* could move, and simulations that test how the form and function of the limb muscles of tetrapods evolved into major locomotor adaptations such as avian bipedalism. A recurrent theme is the importance of the experimental validation of computational models, and the sensitivity analysis of parameters entered into models to test how much unknowns matter for the questions we ask using them in palaeobiology.