Ruolin WU

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Education

University of Bristol Jun 2021 – Jun 2025
School of Earth Sciences *Bristol, UK*
PhD of Palaeobiology

University of Science and Technology of China Sep 2017 – Jun 2020
Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences *Nanjing, China*
Master of Science in Palaeontology and Stratigraphy

China University of Geosciences (Beijing) Sep 2013 – Jul 2017
School of Water Resources and Environment *Beijing, China*
Bachelor of Engineering in Hydrology and Water Resources Engineering

Research Experience

Visiting Researcher Aug 2025 – Oct 2025
Faculty of Sciences, The Friedrich-Alexander University of Erlangen-Nuremberg *Erlangen, Germany*

- **Assessing the adequacy of morphological evolutionary models**
  Conducted model adequacy assessments of morphological evolution models in RevBayes using posterior predictive simulations, comparing simulated and empirical datasets to evaluate the fit of various Mk model variants.

Doctoral Fellow Jun 2021 – Jun 2025
School of Earth Sciences, University of Bristol *Bristol, UK*

- **Origin of angiosperms: quantitative integration of fossil records and the molecular clock**
  Explored a mechanism based on the Bayesian Brownian Bridge (BBB) model to derive fossil-based calibrations from large-scale occurrence datasets for molecular clock analyses. Applied this approach to angiosperm evolution while testing different calibration strategies, providing new insights into the timing of their origin and early diversification.

- **The timescale of eukaryote evolution estimated from Bayesian modelling of the fossil record**
  Adapted the BBB model to accommodate diverse fossil data formats, integrating the latest early eukaryote fossil dataset to enhance molecular clock calibrations and refine estimates of early eukaryotic evolution.

Honorary Research Associate Oct 2020 – Jun 2021
School of Earth Sciences, University of Bristol *Bristol, UK*

- **The phylogenetic relationship of panarthropods**
  Analysed the contested relationships among Onychophora, Tardigrada, and Euarthropoda using a range of phylogenetic inference methods. Demonstrated that morphological data alone cannot statistically resolve the relationships between these phyla, raising questions about the reliability of morphology-based phylogenies, especially those incorporating fossil species.

Graduate Research Fellow Sep 2017 – Jun 2020
Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences *Nanjing, China*
University of Science and Technology of China

- **The origin and early evolution of algae fossils in Neoproterozoic**
  Incorporated advanced imaging and spectroscopic techniques to analyse high-fidelity multicellular red algae fossils from the Weng'an Biota. This research uncovered new insights into the development and reproductive mechanisms of early red algae, providing key evidence for understanding the early evolution of multicellularity in this group.

- **Quantitative analyses on the morphological and taxonomic diversity from Cambrian biota**
  Developed an integrated research approach combining multiple techniques from microscopy to microspectroscopy for studying exceptionally preserved Cambrian fossils. This approach overcame traditional limitations, enabling both structural and chemical analyses to better understand fossil preservation mechanisms and burial conditions.

Publications

(in submission) **Wu R**, Álvarez-Carretero S, Tong Y, Wan S, Schneider H, Clark J, Pisani D, Silvestro D, Donoghue PCJ. **2025**. Closing the 'Jurassic Gap': Integrated analysis of fossil occurrences and molecular divergence time estimation infers a latest Jurassic origin of flowering plants.

(in preparation) **Wu R**, Riedman LA, Pisani D, Porter SM, Donoghue PCJ, Silvestro D. **2025**. The timing of the origin of eukaryotes estimated through Bayesian modelling of the fossil record.

(in preparation) **Wu R**, Carlisle E, Pisani D, Donoghue PCJ, Silvestro D. **2025**. Calibrating the timescale of animal diversification using a mechanistic model to derive fossil-based calibrations.

1. Sun H, Zhao F, **Wu R**, Zeng H, Sun Z. **2024**. Spatiotemporal distribution and morphological diversity of the Cambrian Wiwaxia: New insights from South China. *Global and Planetary Change*, 239(2024).

2. **Wu R**, Pisani D, Donoghue PCJ. **2023**. The unbearable uncertainty of panarthropod relationships. *Biology Letters*, 19:20220497.

3. Miao Y, Yin Z, **Wu R**, Li G, Zhu M. **2021**. Microstructures and in-situ spectroscopic analyses of Conotheca (Orthothecide) from the early Cambrian Kuanchuanpu Biota. (in Chinese with English abstract). *Acta Palaeontologica Sinica*, 60(1):108-123.

4. **Wu R**, Wu S, Yin Z. **2019**. Imaging phosphatized microfossils from the edicaran Weng'an Biota using confocal laser scanning microscopy (in Chinese with English abstract). *Acta Palaeontologica Sinica*, 58(1):130-140.

5. Wu S, Yin Z, Sun W, Zhao D, **Wu R**. **2018**. High-resolution tomography of millimeter-to-centimeter-sized fossils using three-dimensional x-ray microscopy (in Chinese with English abstract). *Acta Palaeontologica Sinica*, 57(2):157-167.

Awards and Scholarships

Scholarship for female postdoctoral researchers | *The Friedrich-Alexander University* Aug 2025
- Scholarship for excellent female postdoctoral researchers to start a project with the hosts at FAU, Germany. Used to support the model adequacy project with Prof. Rachel Warnock.

Young Investigator Travel Award | *Society of Molecular Biology and Evolution* Jul 2025
- Travel award used to cover travel expenses to attend the 2025 annual meeting in Beijing.

The Palaeontological Association Student Travel Grant | *The Palaeontological Association* Sep 2023
- Travel award used to cover travel expenses to attend the 2023 annual meeting in Cambridge.

The University of Bristol Bob Savage Funding Award | *University of Bristol* Jun 2023
- Award used to cover travel expenses to visit Dr Daniele Silvestro's lab at the University of Fribourg in Switzerland, developing the new Bayesian Brownian Bridge method.

Chinese Government Scholarship | *China Scholarship Council* Jul 2020
- Scholarship that sponsors the four-year PhD program at the University of Bristol.

Outstanding Graduates Award | *University of Science and Technology of China* May 2020

Second Prize for Best Oral Presentation | *Nanjing Institute of Geology and Palaeontology, CAS* Nov 2017
- Fieldwork Internship in the Yichang Region, China

Outstanding Student Award | *Nanjing Institute of Geology and Palaeontology, CAS* Nov 2017
- Fieldwork Internship in the Yichang Region, China

Second-Class Scholarship | *University of Science and Technology of China* Sep 2017

Teaching experience and academic outreach

Data Science Advocate | *Jean Golding Institute* 2025
- Delivered training to post-graduates and faculty, monitored and responded to queries in the discussion forum

Meeting Host - Bristol Palaeobiology Discussion Group Meeting Series | *UoB* 2024 - 2025
- Hosted the Meeting Series

Meeting Host - The Molecular Palaeobiology Lab Group Meeting Series | *UoB* 2022 - 2023
- Monitored and hosted the Meeting Series

Lecture Demonstrator/Teaching Assistant | *UoB* 2020 - 2023
- Supervised and guided students in practical classes for 4 modules, including Geobiology, Phylogenetic methods in Palaeobiology, Geology, and Environmental Geosciences
- Demonstrated the lectures using coding languages such as R and Python; troubleshot the use of phylogenetic methods, including iqtree, MrBayes, PAUP, etc.

Fieldwork Assistant | *UoB* 2022
- Co-ordinated the Year-3 undergraduate fieldwork teaching on Jurassic Coast in Lyme Regis

Conference Talks and Posters

2025 Closing the 'Jurassic Gap': Integrated analysis of fossil occurrences and molecular divergence time estimation infers a latest Jurassic origin of flowering plants, *Annual Meeting of the Society for Molecular Biology and Evolution*, Beijing, China | Talk

2025 Calibrating the timescale of animal diversification using a mechanistic model to derive fossil-based calibrations, *Origin of Metazoa: The Jacques Monod Conferences*, Roscoff, France | Talk

2024 The timescale of eukaryote evolution estimated from Bayesian modelling of the fossil record, *The 68th Palaeontological Association Annual Meeting*, Erlangen, Germany | Talk

2024 Origin of angiosperms: quantitative integration of fossil records and the molecular clock, *Mathematical and Statistical Aspects of Molecular Biology Meeting*, London, UK | Talk

2023 Estimating the origin of angiosperms based on quantitative analysis of the fossil record and the molecular clock, *The 67th Palaeontological Association Annual Meeting*, Cambridge, UK | Talk

2021 The unbearable uncertainty of panarthropod relationships, *The 65th Palaeontological Association Annual Meeting*, Manchester, UK | Poster

2018 Rod-shaped red algae with cellular differentiation and holdfasts from the Ediacaran Weng'an Biota, *The 2018 Annual Academic Conference of the Subcommission on Fossil Invertebrates, The Palaeontological Society of China*, Zhengzhou, China | Talk

2018 High-resolution synchrotron tomographic reconstruction of a complex benthic algal thallus from the Ediacaran Weng'an biota, *International Conference on Ediacaran and Cambrian Sciences Joint Meeting of Ediacaran and Cambrian Subcommissions*, Xi'an, China | Poster

2017 Application of laser confocal microscopy in the Weng'an Biota, *The 2017 Annual Academic Conference of the Subcommission on Fossil Invertebrates, The Palaeontological Society of China*, Nanjing, China | Talk

2017 Application of laser scanning confocal microscope in observing microfossils from the Ediacaran Weng'an Biota, *The Second Joint Conference of the Palaeontological Society of China and Palaeontologische Gesellschaft*, Yichang, China | Poster

Skills

Coding language: R, Python
Phylogenetic software/programme: PAUP, TNT, iqtree, MrBayes, PAML, RevBayes, BEAST2
Language: English (professional proficiency); Chinese-Mandarin (native); Chinese-Cantonese (native); French (basic)