

RESEARCH SCHOOL OF EARTH SCIENCES

# ANNUAL REPORT

# 2025



Australian  
National  
University

Cover Image Credit: Adam Norman

Research School of Earth Sciences  
+61 2 6125 3406  
reception.rses@anu.edu.au

The Australian National University  
Canberra ACT 2600 Australia  
www.anu.edu.au

TEQSA Provider ID: PRV12002 (Australian University)  
CRICOS Provider Code: 00120C

# TABLE OF CONTENTS

From the Director	4
Staff	5
In Memoriam	12
Postgraduate Students	13
Staff Honours & Awards	14
Thesis & Awards	15
Student Honours & Awards	17
Undergraduate & Postgraduate Courses	18
Research Activities	
<i>ANZIC</i>	21
<i>Climate &amp; Ocean GeoScience</i>	27
<i>Geochemistry</i>	35
<i>Geophysics</i>	37
<i>Geochemical Instrument Operations</i>	50
<i>Geophysical Data &amp; Computation</i>	51
<i>Laboratory Operations</i>	53
<i>Collections &amp; Curation</i>	54
Research Grants	55
School Seminar Series	57
Peer Reviewed Publications	59
External Committees and Editorial Boards	73
Student News	77

Credit: TBD

# FROM THE DIRECTOR

TBA



# STAFF

## ACADEMIC STAFF

**Director** Dorrit Jacob, Dr. rer. nat. Georg August University Germany (equivalent PhD)  
Diplom in Mineralogy, Johannes Gutenberg Univ, Germany (equivalent MSc)

### Associate Directors

Research & Engagement

Rhodri Davies, MSci PhD Cardiff, UK

Higher Degree Research

Stewart Fallon, BA MS San Diego, PhD ANU (to 30/04/2025)

Penny King, BSc (Hons) ANU, PhD Arizona State (from 01/05/2025)

Education

Louis Moresi, BA (Hons) Cambridge, DPhil Oxford

### Professors

Nerilie Abram, BSc Advanced (Hons) Sydney, PhD ANU (to 31/07/2025)

Olivier Alard, PhD Macquarie, Habilitation Montpellier

Andrew Berry, BSc (Hons) Sydney, DPhil Oxford

Jochen Brocks, Dip Freiburg, PhD Sydney

Rhodri Davies, MSci PhD Cardiff, UK

Michael Ellwood, BSc (Hons) PhD Otago

Stewart Fallon, BA MS San Diego, PhD ANU

Andy Hogg, BSc ANU, PhD UWA (on secondment to ACCESS-NRI)

Penny King, BSc (Hons) ANU, PhD Arizona State

John Mavrogenes, BS Beloit, MS Missouri-Rolla, PhD Virginia Tech

Meghan Miller, BA Whittier, MSc Columbia, MEng Cornell, PhD ANU

Louis Moresi, BA (Hons) Cambridge, DPhil Oxford

Andrew Roberts, BSc Massey, BSc (Hons) PhD DSc Victoria HonFRSNZ  
(Wellington)

Hrvoje Tkalčić, DipEng in Physics Zagreb, PhD UC Berkley

Paul Tregoning, BSurv PhD UNSW

Greg Yaxley, BSc PhD Tasmania

Jimin Yu, BSc MSc Nanjing University, PhD Cambridge

### Associate Professors

David Heslop, BSc (Hons) Durham, PhD Liverpool, Dr. habil. Bremen

Callum Shakespeare, BSc (Hons) ANU, PhD Cambridge

### Adjunct Professor

Phil Cummins, PhD UC Berkely

### Fellows

Michael Anenburg, BSc MSc Ben-Gurion University of the Negev, PhD ANU

Caroline Eakin, MSci Imperial College London, PhD Yale

Siavash Ghelichkhan, BSc Tehran, MSc PhD Ludwig-Maximilians-  
Universitat Munchen

Mark Hoggard, BA MSci MA PhD Cambridge [ARC DECRA Fellow]

Andrew Kiss, BSc (Hons) PhD ANU

Nicola Maher, PhD UNSW [ARC DECRA Fellow]

Son Pham, BEng Hanoi, Postgrad Dip Intl Center for Theoretical Physics,  
PhD ANU [ARC DECRA Fellow]

<b>Research Fellows</b>	<p>Laura Crisp, MSci Imperial College, PhD ANU (from 14/07/2025)</p> <p>Yuhao Dai, BSc Peking University, China, PhD ANU</p> <p>Deepashree Dutta, M.Tech. IIT Kharagpur, PhD UNSW (from 11/08/2025)</p> <p>Georgina (Georgy) Falster, BSc (Hons) PhD Adelaide (to 01/03/2025)</p> <p>Chris Gouramanis, BSc La Trobe University, BSc ANU, PhD ANU</p> <p>Chiara Holgate, BEng UNSW, M.Hydrology Vrije Universiteit Amsterdam, PhD ANU</p> <p>Wilma Huneke, BSc MSc Kiel, PhD Tasmania</p> <p>Chengxin Jiang, BS and graduate study in geology China Univ of Geosciences, PhD Macquarie [ARC DECRA Fellow]</p> <p>Michael Koch, BTech NIT Silchar, MTech IITG, PhD Kyoto University</p> <p>Voon Hui Lai, BA UC Berkeley, MSc PhD California Inst of Technology</p> <p>Fabrizio Magrini, BSc MSc Milan, PhD Universita` Roma Tre</p> <p>Rebecca McGirr, BSc (Hons) Sydney, PhD ANU</p> <p>Laura Miller, MSci Imperial College London, PhD ANU</p> <p>Adele Morrison, BSc (Hons) ANU, GradDipEd Canberra, PhD ANU [Lecturer]</p> <p>Anthony Purcell, BSc (Hons) PhD ANU (to 05/2025)</p> <p>Luwei Yang, BSc Ocean University of China, PhD UTAS</p> <p>Qing Zhang, BSc Hebei Normal Uni, MEng CUGB, PhD Wollongong (to 13/09/2025)</p>
<b>Lecturers</b>	<p>Laura Otter, BSc JGU, MSc joint JGU and MPIC, PhD Macquarie (to 01/11/2025)</p> <p>Kial Stewart, BSc (Hons), PhD ANU</p>
<b>Postdoctoral Fellows</b>	<p>Wilton Aguiar, PhD Federal University of Rio Grande (Brazil)</p> <p>Hamish Brown, MSci University of Glasgow, MSc LMU Munich (from 19/05/2025)</p> <p>Ross Chandler</p> <p>Joëlle D'Andres, BSc MSc ETHZ, PhD ANU</p> <p>Thomas Duvernay, BSc MSc Universite Paris Diderot</p> <p>Sam Eggins, BAppSci UNSW, PhD Tasmania</p> <p>Elizabeth (Lizzie) Ellison, BSc (Hons) Durham, MSc Southampton, PhD Imperial College London</p> <p>Miriam Gauntlett, BA Cambridge, MSc UCL, PhD Oxford</p> <p>Imogen Gabriel</p> <p>Jinyin Hu, BSci &amp; MSci Univ Sci&amp;Tech China, PhD ANU</p> <p>Augustin (Auggie) Marignier, MSci PhD University College London (to 23/01/2025)</p> <p>Carl Martin, MSci MA PhD Cambridge (from 27/10/2025)</p> <p>Louise Maubant (to 22/03/2025)</p> <p>Konstantinos Michailos</p> <p>Liam Morrow, PhD Queensland University of Technology</p> <p>Julia Neme</p> <p>Robert Pickle, BS UC at Davis, MSc Brown, PhD Auckland</p> <p>William Scott, MSci PhD Imperial College London</p> <p>Marvin Seow, BSocSci(Hons) NUS, MSc PhD UTokyo</p> <p>Tianwei Sun, MSci Institute of Geophysics, China Earthquake Administration, PhD University of Science and Technology of China (from 11/08/2025)</p> <p>Chunwan Wei</p> <p>Zhi Wei, BSc CUMT (China University of Mining and Technology), PHD UCAS (University of Chinese Academy of Sciences)</p> <p>Ping Zhang, BSc Jilin Univ, MSc Univ Sci&amp;Tech China, PhD ANU</p>

<b>Emeritus Professors</b>	Richard Arculus, BSc PhD Durham, FAIMM
	Vickie Bennett, BSc PhD UCLA
	Ian Campbell, BSc UWA, PhD DIC London
	Steve Cox, BSc UTas, PhD Monash
	Patrick De Deckker, BA MSc (Hons) Macquarie, PhD DSc Adelaide
	Stephen Eggins, BAppSc UNSW, PhD UTas
	David Ellis, MSc Melbourne, PhD UTas
	Neville Exon, BSc (Hons) UNSW, PhD Kiel
	Ross Griffiths, BSc PhD ANU, FAIP, FAA
	Rainier Grun, Diplo Geol, Dr.rer.nat.habil Köln, DSc ANU, FAAH
	Ian Jackson, BSc Qld, PhD ANU, FAA
	Brian Kennett, MA PhD ScD Cambridge, FAA, FRS
	Kurt Lambeck, BSurv NSW, DPhil DSc Oxford, FAA, FRS
	Hugh O'Neill, BA Oxford, PhD Manchester, FAA, FRS
	Brad Pillans, BSc PhD ANU, HonFRSNZ
	Michael Roderick, BAppSc QUT, PGDipGIS Qld, PhD Curtin
	Malcolm Sambridge, BSc Loughborough, PhD ANU
	Ian Williams, BSc PhD ANU
<b>Honorary Professors</b>	Nerilie Abram, BSc Advanced (Hons) Sydney, PhD ANU
	Stephen Foley, BSc (Hons) Southampton, MSc Memorial Univ Newfoundland, PhD Tasmania
	Clinton Foster, BSc (Hons) Adelaide, PhD Qld
	Andrea Gerson, PhD Strathclyde Scotland
	William Maher, BAppSci (Hons) MAppSci Melbourne, PhD Southampton
	Eelco Rohling, BSc MSc PhD Utrecht
	Neil Williams, BSc (Hons) ANU, MPhil PhD Yale
	Lesley Wyborn, BSc (Hons) Sydney, Dip Ed UC, PhD ANU
<b>Honorary Associate Professors</b>	Yuri Amelin, MSc PhD Leningrad State
	Richard Armstrong, BSc MSc Natal, PhD Witwatersrand
	Robert Burne, BSc Wales, DPhil Oxford
	C. Mark Fanning, BSc Adelaide
	George Gibson, BSc Edinburgh, PhD Otago
	David Huston, BSc Colorado School of Mines, MSc Arizona, PhD Tasmania
	A. Lynton Jaques, BSc (Hons) WA, PhD UTas
	Simon McClusky, BSurv PhD UNSW
	Terry Mernagh, BSc (Hons) PhD Newcastle
	Roger Skirrow, BSc WA, Postgrad Dip Sci (Hons) Newcastle, MSc Carleton Univ, PhD ANU
	Richard Stern, BSc (Hons) Waterloo, PhD Stony Brook

## Academic Staff List

**Honorary Senior Lecturers**  
Grace Shephard, BSc (Adv. Hons I), PhD Sydney  
Andrew Valentine, BA MSc Cambridge, DPhil Oxford

**Honorary Lecturers**  
Sebastien Allgeyer, PhD Paris Diderot, France  
Lynne Bean, BSc Sydney, DipEd Syd Teachers College, Grad Dip, PhD ANU  
Antony Burnham, MSci MA Cambridge, PhD Imperial College London  
Sima Mousavi, BSc MSc, Tehran University, PhD Leipzig  
Janaina Nunes Avila, BSc MSc UFRGS, PhD ANU  
Guozhi Xie, BSc Hefei Univ Technol, PhD Univ Chinese Acad Sci

**Visiting Fellows & Academic Visitors**  
Wei Gan  
Hongjian Fang  
Kerry Gallagher  
Chris Klootwijk  
Ping Wang  
Qingyu Wang  
Yusuke Yokoyama, PhD ANU  
Kaifeng Zhao  
Siyuan Zhao

**Visitors**  
Brad Opdyke, AB Columbia, MS PhD Michigan  
Trevor Ireland, BSc Otago, PhD ANU

TBD

# PROFESSIONAL STAFF

<b>School Manager</b>	Geoff Pearson, BA, BTh, MBA, FIML
<b>Executive Assistant to the Director &amp; the School Manager</b>	Telesia (Sia) Adams Yue Yang (from 24/11/2025, during Sia Adams' maternity leave)
<b>Administration Manager</b>	Adam Norman, BSc (Hons) Trent
<b>Building and Facilities Officer</b>	Eric Ward, Cert V Frontline Management, Quest/ANU (to 20/11/2025)
<b>WHS Officer</b>	Elmira Mohamed, BSc, MSc, IUST, PhD ANU (to 17/01/2025) Sofia Cepeda Rojas (from 31/03/2025)
<b>Education Developer</b>	Honor McGregor, BSc Macquarie, GradDipEd (Science)
<b>Senior HDR Administrator</b>	Robyne Anderson, B.Bus (USC)
<b>Student Administration Officer</b>	Kevin Thow, BA Macquarie, MPolScAdv ANU
<b>Research Group Administrators</b>	Josephine (Jos) Magro Mary Hapel
<b>IODP/ANZIC Director</b>	Ron Hackney, BSc (Hons) ANU, MSc Victoria University of Wellington, PhD UWA
<b>IODP/ANZIC Program Manager</b>	Sarah Kachovich, Bsc (Hons) UOW, PhD University of Queensland Kelly-Anne Lawler (Program Manager during Sarah Kachovich's maternity leave)
<b>IODP/ANZIC Administrator</b>	Liz Arnold
<b>IODP/ANZIC Communications Officer</b>	Janelle Kennard
<b>21<sup>st</sup> Century Weather, Government and Industry Liaison (3-year appointment)</b>	Lucía Gamarra Cuba, BSc (Peru), GDipFin, M Integrated Water Mgt, Griffith
<b>21<sup>st</sup> Century Weather Administrator</b>	Sarah Andrew, BSc University of Auckland, BSc(Hons) PhD ANU
<b>Collections Officer</b>	Michael (Mikey) Elliott (to 12/02/2025)

**Laboratory Operations**

<b>Manager</b>	Andrew Latimore, BEng University of Canberra
<b>Technical Support</b>	David Clark, Cert III Metal Fabrication AdvDipEng CIT Rebecca Esmay, BSc (Sr Thesis) SUNY Purchase Pengxiang Hu, PhD ANU & Chinese Academy of Sciences Petr Lanc, AssocDip Bus (Applied Computing) CIT Yile Liu, BEng MEng ANU Hayden Miller, AdDipMechEng CIT Yao Qian, BEng Anhui Univ, MSc Beijing Normal Univ, PhD ANU (to 08/06/2025) Angus Rummery, Cert III CIT (x3)

**Geochemical Instrument Operations**

<b>Manager</b>	Brett Knowles, BSc PhD Wollongong
<b>Technical Support</b>	Halimulati Ananuer Hah Jung (Jay) Chin, BA MArchSci ANU (to 27/05/2025) Babs Fairchild, BSc Hons (Chem) U Adel, PhD (Phys) U Melb, Cert IV TAE URMIT Michael Förster, PhD Macquarie University (to 07/11/2025) Yoann Gréau, PhD Macquarie University ( Facility manager) Heze (Felix) Gong, MSc Kyoto University (Japan), MEc ANU (from 14/11/2024) Kathryn Hayward , BCom Wollongong, MNHD MPhil PhD ANU Janet Hope, BSc James Cook Lily Quirke, BSc (Hons) ANU (from 01/09/2025) Laura Rodriguez Sanz, BSc Venezuela, MEnvStudies, PhD Autonomous (Barcelona) (to 05/05/2025) Yue Wang, BSc and MSc Jilin University, PhD Chinese Academy of Geological Sciences Catherine Wilsbacher, BArt & BSci Purdue Univ, MSci Kent State Univ, PhD ANU (from 28/07/2025) Jiade Wu, BSc and MSc USTC, PhD ANU Yang Wu, BEng China Univ, MSc Univ Newfoundland, PhD ANU Sonja Zink, BSc Hanover, Diploma (MSc) Hanover
<b>Research Coordinator</b>	Chris Ingles, BSc (Hons), PhD ANU (from 01/10/2025)

**Geophysical Data & Computation**

<b>Manager</b>	Herb McQueen, BSc Qld, MSc York, PhD ANU
<b>Scientific Programmers</b>	Julian Byrne, BSc (Hons) ANU, PhD Monash
<b>Software Engineer</b>	Angus Gibson, BCompSci (Hons) PhD ANU Dale Roberts, BSc (Hons) PhD Adelaide
<b>Research Officers</b>	Juan Carlos Graciosa, BSc MSc University of San Carlos, PhD Monash Sima Mousavi, BSc MSc, Tehran University, PhD Leipzig
<b>Technical Support</b>	Kimberley Berends Rajesh Erigela, BTech Jawaharlal Nehru Technological University, PGDip NIELIT India, MScEng Swinburne (to 30/08/2025) Venkata Sai Jaswanth Kota, B.Tech (CSE) G.I.E.R. Rajahmundry, India, MScIT La Trobe Juan Santiago Velasquez, BSc Universidad de los Andes, MSc LMU Munich (from 17/03/2025) Ramkumar Voore, B.Tech (CSE) LPU INDIA, MScDS La Trobe

**COG Support**

<b>Research Officers</b>	Paola Corrales, PhD University of Buenos Aires (from 03/12/2025) Laura Velasquez Jimenez, BSc Pontificia Universidad Javeriana, MSc PhD James Cook (to 18/10/2025) Kelly-Anne Lawler Claudia Stepin (from 21/07/2025) Catherine Wilsbacher, BArt & BSci Purdue Univ, MSci Kent State Univ, PhD ANU (from 28/07/2025)
--------------------------	--

TBD

TBD

# IN MEMORIAM

## William Compston

William Compston FAA FTSE FRS, was born in Western Australia in 1931. In the early 1960s Bill was persuaded by Prof. Jaeger to join the Department of Geophysics at the ANU. There, in collaboration with the Bureau of Mineral Resources (BMR), he set up the laboratory and mass spectrometer necessary for Rb-Sr dating and began dating Australian rocks whose ages were little known at the time.

Following the return of the first lunar samples by the Apollo 11 astronauts in 1969, Bill was one of the few researchers chosen by NASA to date the rocks, while Ted Ringwood and Ross Taylor at RSES worked on other aspects of their geochemistry. Bill's results compared well with those from leading international labs, increasing confidence in his ANU procedures.

At the first lunar science conference, Bill learned of U-Pb dating on a very small scale using an ion microprobe. Although the method allowed isotopic compositions to be measured, results were affected by molecular interferences, prompting Bill to seek ways to overcome them.

Working with Steve Clement, who had designed the mass spectrometer used for the lunar samples, Bill decided RSES should build an ion microprobe for geological work. Clement's modelling showed the instrument would need to be three times larger than existing mass spectrometers to achieve the required resolution and sensitivity. Despite advice against it, the project was made possible by block funding and strong support from Director Anton Hales, with contributions from several RSES groups.

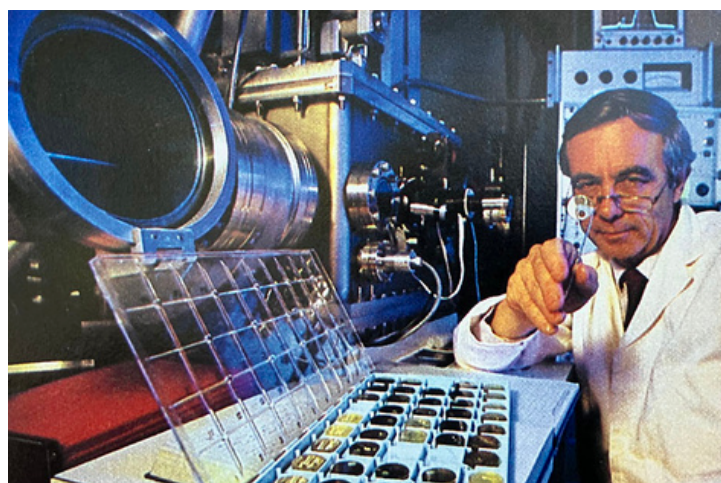
Clement designed the ion optics, and construction of SHRIMP began in 1974, with much of the hardware built in RSES workshops. By 1981, experiments with Ian Williams were dating U-Pb in zircon, with the first results announced in the 1981 RSES Annual Report.

SHRIMP revolutionised U-Pb geochronology and, until LA-ICPMS was developed, was the only method for accurate in-situ dating on a 20 µm scale. Major successes included dating lunar zircon, refining the geological time scale, and discoveries of Earth's oldest zircons in Western Australia, including detrital zircon nearly 4.4 Ga old at Jack Hills and igneous rocks older than 4.0 Ga.

In a 2005 interview with the Australian Academy of Science, Bill reflected on the opportunities provided by RSES, the importance of block funding, and workshop support. SHRIMP later became a commercial success, with the last of 20 instruments installed in China in 2023.

William Compston FAA FTSE FRS died peacefully with family present on Friday 16 May 2025, aged 94 years.

Summarised by Ian Williams, RSES.



# POSTGRADUATE STUDENTS

## PhD Candidates

Adroli, Nurmalia Mauludin	Huang, Zhijie	Owens, Ryan John
Ahnaf, Jemi Saputra	Hussain, Jabir	Pandey, Abhay
Arcot Parthiban, Ramkumar	Ingles, Christopher	Pasic, Bozana
Baeza, Leonardo Ismael	Jayasoma, Kushani	Perumbodathu Sudhakran, Deepa
Baillie, Graeme	Jeffree, Jemima	Pradeep, Vishnupriya
Barnes, Ashley	Ji, Xuan	Rama, Jemima
Beezley Bae	Jiang, Shihao	Saikia, Pallav Jyoti
Bhagtani, Dhruv	Jones, Alysha May	Sajeev, Sruthy
Biddle Jessica	Kasaundhan, Hitank	Sakti, Artadi Pria Sakti
Bishop, Caleb	Kirby, Rachel Sarah	Sanjayan Nair Bindhu, Ammu
Bland, Sebastian	Lawler, Kelly-Anne	Sebastian, Nita
Bonning, Geoffrey	Leong, Edgar	Sembatya, Naiga Erios
Chandler, Ross Berge	Leong, Kit Ieng	Sholeninova, Polina
Chang, Haining	Leong, Timothy Sung Jue	Smith, Catherine
Cheng, Ming	Lewis, Hilary	Sun, Weipin
Cheng, Yun-Ze	Loidolt, Christina	Sun, Yaojia
Copeland, Jackson	Lu, Neng	Sweetman, James
De Freitas Rodrigues, Rodrigo	Lovi, Jacob	Turunctur, Buse
Dodd, Lachlan	Makushkina, Anna	Urien, Salome
Dong, Shixian	Martin, Stacey Servito	Weber, Rikki
Eggins, Sam	Medd, Oliver Merlin	Wilsbacher, M Catherine
Ellepola, Anupiya Vidarshana	Meng, Hangyu	Wu, Jiade
Fang, Bowen	Mina, Alana Andrea	Xie Letiian
Goswami, Pranami	Nakrong, Nipaporn	Ye, Tao
Gray, Sharon	Nugraheni, Rosmalia Dita	Yeung, Ho Sonia
Grun, Robin	Nugroho, Hendro	Yung, Claire
Hsu, Shao-Chen	O'Brien, Helen Jane	Zhou, Jiarun
Hu, Jinyin		

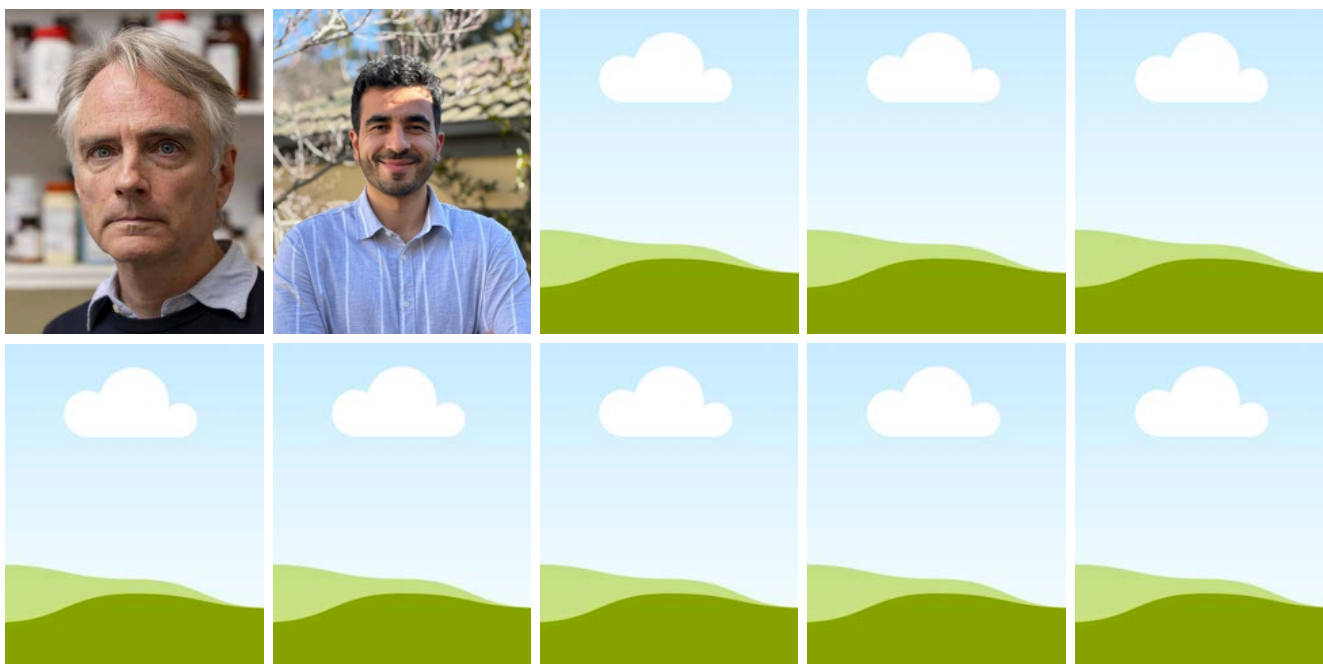
## MPhil Candidates

Baile, Riley John	Bilton, Leon Serwin	Sombutsirinun, Phudit
Keane, Kathryn	Liang, Man	Wu, Yunqi (Yoli)

# STAFF HONOURS & AWARDS

STAFF MEMBER	AWARD	AWARDING BODY
Andrew Berry	2025 Neumann Medal	Mineralogical Society of the UK and Ireland
Siavash Ghelichkhan	Outstanding Early Career Scientist Award	European Geophysical Union (EGU)
Adele Morrison	2025 Early Career Scientist Medal (physical oceanography)	International Association for the Physical Sciences of the Oceans (IAPSO)
Julia Neme	Most Selfless Contributor Award	Consortium of Ocean and Sea Ice Modelling in Australia
Rhodri Davies	Bear McPhail Excellence in Teaching Award	RSES
Rhodri Davies	Dean's Commendation for Excellence in Supervision	ANU
Chengxin Jiang	K.S.W. Campbell Teaching Award	RSES
Chengxin Jiang	Editors' Citation for Excellence in Refereeing	Geophysical Research Letters

Clockwise from top left: Andrew Berry, Siavash Ghelichkhan



# THESES AND AWARDS

## **PhD theses completed (Supervisor in parentheses)**

Pranami Goswami completed her PhD thesis entitled “Genomic Diversity of Magnetotactic Bacteria from Underexplored Extreme Aquatic Habitats” (Dave Heslop)

**MPhil thesis completed (Supervisor in parentheses)**

**Master of Earth Sciences (Advanced) (Supervisor in parentheses)**

**Honours completed (Supervisor in parentheses)**

Hansen Guong “The effectiveness of a GNSS and GRACE inversion for identifying groundwater changes in Victoria.” (Paul Tregoning)

Ruby Hackett “Disentangling modern melting and GIA signals by combining gravity and GPS observations” (Rebecca McGirr)

Catherine Still “Pollen extraction: on the path to improving radiocarbon date accuracy of lakebed sediments” (Dave Heslop & Prof. Yusuke Yokoyama - University of Tokyo)

Alexandra Vickery, “M-ICE-STERIOUS SIGNALS: Investigating Anomalous Glacial Earthquakes at the Pine Island Glacier” (Thanh-Son Pham & Malcolm Sambridge). Awarded University Medal.

# STUDENT HONOURS & AWARDS

## Higher Degree Research

AE Ringwood Supplementary Scholarship	Salome Urien
D.A. Brown Travel Scholarship	Kushani Jayasoma
Sue Kesson Experimental Petrology Student Travel Grant	Rodrigo de Freitas Rodrigues
Mervyn and Katalin Paterson Travel Fellowship	Anupiya Ellepola and Shihao Jiang
Alan and Julia Beck Scholarship	??
Jaeger Scholarship	??

## Undergraduate

University Medal	Alexandra Vickery
AL Hales Scholarship	Alex Vickery
Ian McDougall Scholarship	Dine Yoo
Regolith Scholarship	Max Lecoutre
W B Clarke Second Year Prize in Earth Sciences	??
Irene Crespín Prize for Palaeontology	??
GSA Mike Rickard Third Year Prize	??
Graduate Women NSW (Canberra) Prize in Climate Science	??
Edward Irving Prize for Geophysics	??

# UNDERGRADUATE & POSTGRADUATE COURSES

Earth & Marine Science Programme			
Course Code	Course Description	Convenor, Teaching staff	Number of students
Semester 1			
EMSC1006/6107	The Blue Planet: An Introduction to Earth System Science	<b>M.Ellwood,</b> N. Abram, A. Morrison, G. Falster	129
EMSC2022	Introduction to Global Geophysics	<b>M. Miller,</b> D. Heslop, V. Hui Lai, L. Moresi	23
EMSC2023	Fundamentals of Geology	<b>G. Yaxley,</b> C. Gouramanis	38
EMSC3020/6019	Geobiology & Evolution of Life on Earth	<b>J. Brocks,</b> S. Kealy, S. Haberle	38
EMSC3023/6023	Marine Biogeochemistry	<b>M. Ellwood</b>	19
EMSC3024/6024	Magmatism & Metamorphism	<b>A. Berry,</b> G. Yaxley, O. Alard	9
EMSC3032/6032	Melting Polar Ice Sheets	<b>P. Tregoning</b>	10
EMSC3033	Applied Geophysics	<b>D. Heslop,</b> R. Hackney, R. Pickle	12
EMSC3039/PHYS3039	Climate Dynamics	<b>C.Shakespeare,</b> <b>K. Stewart,</b> N. Maher	21
EMSC4017/8017	Research Methods and Proposal	<b>C. Shakespeare,</b> C. Gouramanis	10
EMSC4033/8033	Computational Geosciences: Problem-solving, Logical Thinking and Programming	<b>L. Moresi</b>	9
EMSC4122/8022	Analytical Techniques	<b>S. Fallon</b>	8

Undergraduate & Postgraduate Courses

Earth & Marine Science Programme			
Course Code	Course Description	Convenor, Teaching staff	Number of students
Semester 1 (continued)			
EMSC4706/8706	Natural Hazards	<b>P. Cummins</b>	7
EMSC8032	Research Proposal & Presentation	<b>D. Heslop</b>	3
Winter			
EMSC3019/6119	Coral Reef Field Studies	<b>S. Fallon,</b> M. Ellwood, G. Falster	27
Semester 2			
EMSC1008/6008	EARTH: The Chemistry and Physics of our Planet	<b>A. Berry,</b> <b>C. Eakin</b>	59
EMSC2021/6021	Fundamentals of Climate Science	<b>C. Shakespeare</b> A. Morrison L. Yang	48
EMSC2024/6124	Geochemical Cycles	<b>J. Brocks,</b> O. Alard, D. Jacob	15
EMSC3002	Structure and Tectonic Evolution of the Australian Plate	<b>L. Moresi,</b> C. Jiang, C. Gouramanis	17
EMSC3007/6007	Economic Geology	<b>J. Mavrogenes</b>	11
EMSC3022/6022	Planetary Science	<b>P. King,</b> O. Alard	36
EMSC3025/6025	Remote Sensing of Water Resources	<b>P. Tregoning,</b> R. McGirr	19
EMSC3034/6034	Dynamic Earth: Plates, Plumes and Mantle Convection	<b>R. Davies</b>	13
EMSC4017/8017	Research Methods and Proposal	<b>H. Tkalčić</b>	10
EMSC4123/8023	Data Analysis	<b>M. Sambridge,</b> F. Magrini	11
EMSC4712/8712	Electronics and Data Analysis	<b>M. Sambridge,</b> J. Machacek	9
EMSC8032	Research Proposal & Presentation	<b>D. Heslop</b>	2

Undergraduate & Postgraduate Courses

**Earth & Marine Science Programme**

Course Code	Course description	Convenor, teaching staff	Number of students
-------------	--------------------	--------------------------	--------------------

New Colombo Plan

EMSC3050/8014	NCP Field trip (Japan)	<b>D. Heslop,</b> S. Mousavi	12
---------------	------------------------	---------------------------------	----

All Year

EMSC3050/8014	Special Topics	<b>L. Moresi,</b> <b>D. Heslop,</b> and 10 supervisors for each Special Topic project	9
---------------	----------------	---	---

**Honours and MES(A) Courses**

All Year

EMSC4005	Earth and Marine Sciences Honours Thesis	<b>C. Shakespeare</b>	18
----------	--	-----------------------	----

EMSC4008	Physics of the Earth Honours Research Project	<b>C. Shakespeare</b>	4
----------	---	-----------------------	---

EMSC8030	Earth Science Research Project	<b>D. Heslop</b>	6
----------	--------------------------------	------------------	---

**Physics Programme (Research School of Physics)**

Semester 2

PHYS2201	Classical Mechanics	C. Shakespeare	44
----------	---------------------	----------------	----

PHYS3070	Physics of the Earth	<b>H. Tkalčić,</b> L. Moresi	1
----------	----------------------	---------------------------------	---

**Biological Anthropology Programme (Research School of Humanities & the Arts, School of Archaeology and Anthropology)**

ARCH3042/6542	Scientific Dating in Archaeology and Palaeoenvironmental Studies	D. Heslop	34
---------------	--	-----------	----

**Environmental Science Programme (Fenner School of Environment & Society)**

ENVS3013/6303	Climate Change: Past, Present and Future	<b>N. Abram</b>	64
---------------	--	-----------------	----

# AUSTRALIAN & NEW ZEALAND INTERNATIONAL SCIENTIFIC DRILLING CONSORTIUM (ANZIC)

- Director** Dr. Ron Hackney
- Program Manager** Dr. Sarah Kachovich  
Kelly-Anne Lawler (Program Manager during Sarah Kachovich's maternity leave)
- Members** Janelle Kennard  
Liz Arnold

ANZIC is the Australian & New Zealand International Scientific Drilling Consortium. We equip scientists in Australia and New Zealand with the skills, global connections, samples and data they need to explore Earth's processes, past and future, through scientific drilling. The ANU Research School of Earth Sciences has hosted the ANZIC office for more than a decade. In 2025, we were active across four major areas as outlined below.

## Nurturing partnerships

As a strategic collaboration between 16 of Australia and New Zealand's leading universities and scientific organisations, re-signing our Australia consortium members was a major achievement in 2025. Through ANZIC membership, the collective of universities and government agencies gains access to billion-dollar scientific drilling infrastructure, large-scale research projects and specialised training conducted by ANZIC's international partners. As ANZIC's host institution, ANU scientists have unique opportunities to investigate core samples from up to three kilometres below the ground or seafloor.

In 2025 we kept our consortium strong by gathering our Governing Council and Science Committee members in Auckland for a four-day forum in June to work together on our future vision and share our science. ANZIC Director, Ron Hackney, also travelled around our New Zealand member institutions, and helped lead cross-institution collaboration in a workshop titled Shaping the Future of Aotearoa New Zealand's Involvement in Global Scientific Drilling Programs prior to the Geoscience Society of New Zealand Conference in November.

International Scientific Drilling Forum attendees including ANU's Will Grant in one of Sicily's salt mines.



ANZIC (continued)

We also worked hard to nurture our international partnerships and memberships, ensuring continuing access to international ocean and continental scientific drilling programs, through:

- pursuing membership to the International Ocean Drilling Programme (IODP<sup>3</sup>) – a new Europe/Japan led international marine research collaboration building on the IODP (International Ocean Discovery Program) legacy
- continuing membership with the International Continental Scientific Drilling Program (ICDP)
- participating in the international Scientific Drilling Forum in October (Italy)
- contributing to the Executive Boards of ICDP and IODP<sup>3</sup> (Ron Hackney, ANU)
- providing a gateway for local experts to represent our region on ICDP and IODP<sup>3</sup> committees and advisory panels.

Within our region, ANZIC affiliation with professional bodies, including Science and Technology Australia, the National Marine Science Committee, and Ocean Decade Australia, provides valuable opportunities for engagement with key stakeholders.

**Providing access to infrastructure**

Through our membership of ICDP and IODP<sup>3</sup>, and financial and logistical support for expeditioners, ANZIC facilitated the participation of scientists and Outreach Officers in 7 international scientific drilling projects as follows.

- IODP<sup>3</sup>-NSF (US National Science Foundation) Expedition 501: New England Shelf Hydrogeology, probing sub-seafloor ground water with Dr Sara Polanco, University of Sydney, in the science party.
- IODP<sup>3</sup> Expedition 502: Impact of Petit-Spot Magmatism on Subduction Zone Seismicity and Global Geochemical Cycles, on drilling ship Chikyu with **four ANZIC expeditioners**:
  - Prof Andrew Roberts (ANU) led the shipboard paleomagnetism efforts
  - Dr Louisa Stokes (Curtin University) in the paleomagnetism team
  - Mila Huebsch (PhD student, University of Auckland) as an offshore participant
  - PhD student Sarah Barnes (ANU) travelled as a Science Communicator.

ANZIC Expeditioners (centre) Andrew Roberts (RSES) and Louisa Stokes (Curtin University) with other science team members enjoying the sunset aboard RV Chikyu on IODP<sup>3</sup> Expedition 502.



Liftboat Robert off the New England coast for IODP Expedition 501.

## ANZIC (continued)

**Providing access to infrastructure (continued)**

- IODP<sup>3</sup> Expedition 503: Hadal Trench Tsunamigenic Slip History, on board Chikyu in the Japan Trench. ANZIC expeditioners were
  - Assoc Prof Lorna Strachan (University of Auckland) who sailed as co-lead sedimentologist
  - PhD student Anthony Shorrock (University of Auckland).
- ICDP project SWAIS2C: Sensitivity of the West Antarctic Ice Sheet to 2°C of warming, with field party members Dr Georgia Grant (Earth Sciences NZ) as lead sedimentologist and Dr Martin Tetard (Earth Sciences NZ) taking machine learning to Antarctica to identify microfossils. Dr Linda Armbrrecht (University of Tasmania) continued to be involved from the laboratory.
- ICDP project GOE-DEEP: Gabon and Oxygenation of Earth - Drilling Early Earth Project, with nine [RH1] [RH2] Australians part of the extended science team:
  - Tim Johnson, Mike Hartnady, Chris Kirkland, Uwe Kirschner, Kliti Grice (Curtin University)
  - Alan Collins, Juraj Farkas (Adelaide University)
  - Heidi Allen and David Martin (Geological Survey of WA)
- ICDP project BVDP: The Bushveld Complex Drilling Project.
- ICDP project WEIHE: Weihe Basin Deep Drilling Project (Phase I) Mio-Pleistocene Asian hydroclimate variability and dynamics.

The SWAIS2C team – including two ANZIC expeditioners – in Antarctica after a successful season retrieving over 200m of core from beneath the Ross Ice Shelf



ANZIC (continued)

We provided significant funding for post-expedition research to four expeditioners, totalling \$61,000, via our Post Drilling Analytical Funding scheme.

We also provided support for eight people (including Assoc Prof Ron Hackney, Assoc Prof Will Grant) to travel to six different post-drilling science/editorial meetings and awarded \$22,000 worth of travel support grants so that six scientists (including Dr Sarah Kachovich from ANU) could take part in international workshops developing new drilling proposals.

In addition, we enabled Australian and New Zealand scientists to study previously collected (legacy) cores and data through our Continent & Ocean Research & Education (CORE) Funding. We awarded over \$190,000 to 10 exciting new projects.

**Fostering the skills pipeline**

ANZIC provides specialist development opportunities to ensure that scientists in our region have the skills necessary to continue deep Earth discovery into the future. Major activities in 2025 are listed below.

- We conducted a brand new ANZIC Marine Geoscience Masterclass, hosted by the University of Otago in Fiordland (December). Competition was fierce for the 24 places on this 12-day immersive course for exceptional students from our Australian, New Zealand and international partner institutions (including Jarell Cubarrubia and Alex Luk from ANU).
- We reinstated CAPSTAN, the Collaborative Australian Postgraduate Sea Training Alliance Network, in collaboration with CSIRO and the University of Tasmania’s Institute for Marine and Antarctic Studies, with a 10-day training voyage on RV Investigator for 30 students (including Sebastian Viner from ANU).



ANU students Jarell Cubarrubia and Alex Luk on deck at the ANZIC Masterclass in stunning Fiordland.

ANZIC Director, Ron Hackney, on Research Vessel Polaris II, during his visit to Otago University, one of ANZIC’s member institutions.



ANZIC (continued)

**Fostering the skills pipeline (continued)**

- Our Distinguished Lecturer Series was launched to share insights, promote scientific drilling and foster scientific leadership skills. Our inaugural Distinguished Lecturer, Prof. Laura Wallace, toured eight ANZIC member institutions, including ANU, where she gave an RSES seminar and participated in a geophysics student conference.
- Specialist training was provided through seven international ICDP training courses and IODP summer schools, which we supported a total of 27 students to attend (including Ezra Nugroho from ANU).
- We instigated the ANZIC Prize for Best Student Publication and awarded our first recipient (Ratneel Deo, PhD student, University of Sydney).
- We reinstated CAPSTAN, the Collaborative Australian Postgraduate Sea Training Alliance Network, in collaboration with CSIRO and the University of Tasmania’s Institute for Marine and Antarctic Studies, with a 10-day training voyage on RV Investigator for 30 students (including Sebastian Viner from ANU).
- Our Distinguished Lecturer Series was launched to share insights, promote scientific drilling and foster scientific leadership skills. Our inaugural Distinguished Lecturer, Prof. Laura Wallace, toured eight ANZIC member institutions, including ANU, where she gave an RSES seminar and participated in a geophysics student conference.
- Specialist training was provided through seven international ICDP training courses and IODP summer schools, which we supported a total of 27 students to attend (including Ezra Nugroho from ANU).
- We instigated the ANZIC Prize for Best Student Publication and awarded our first recipient (Ratneel Deo, PhD student, University of Sydney).



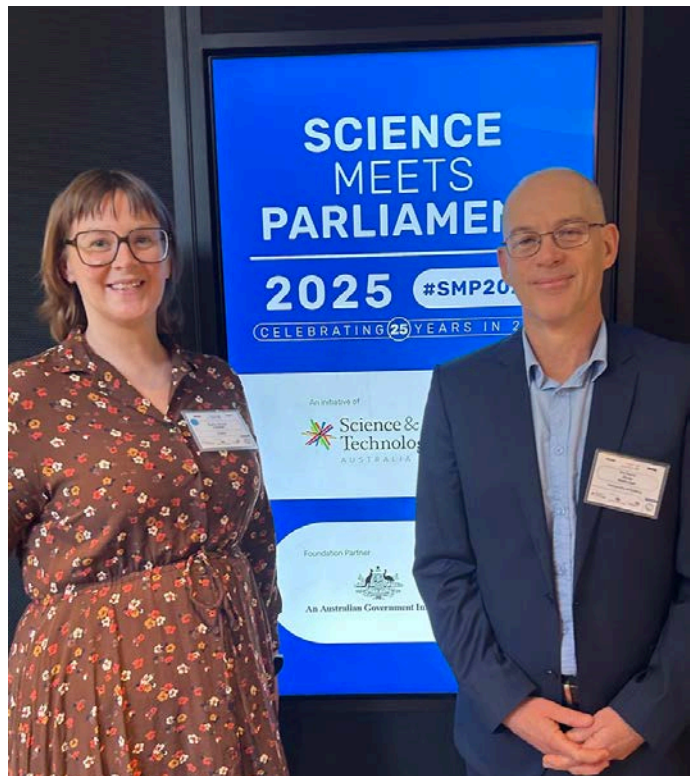
ANZIC Masterclass students – including RSES student Jarell Cubarrubia – describe the cores they collected from Doubtful Sound.

ANZIC (continued)

**Demonstrating impact**

ANZIC continued to demonstrate the global impact of scientific drilling, and the local impact of ANZIC activities and membership. In 2025 we:

- workshopped our vision and ‘brand’ at our annual ANZIC Forum
- sponsored two scientists, including Kelly Lawler from ANU, to take part in Science Meets Parliament in April
- amplified the voices of ANZIC expeditioners as they published their findings or promoted the significance of their voyage in outreach activities
- hosted booths and events at two scientific conferences
- participated in a side event, Understanding the Ocean Below the Seafloor, for international decision makers at the UN Oceans Conference in June
- Dr Sarah Kachovich gave a keynote presentation at the AuScope Research Conference (November) demonstrating the impact of scientific drilling over the last six decades.



RSES PhD student, Kelly Lawler, at Science Meets Parliament, along with Jodi Webster (University of Sydney)

# CLIMATE & OCEAN GEOSCIENCE

**Area Head** Prof. Paul Tregoning

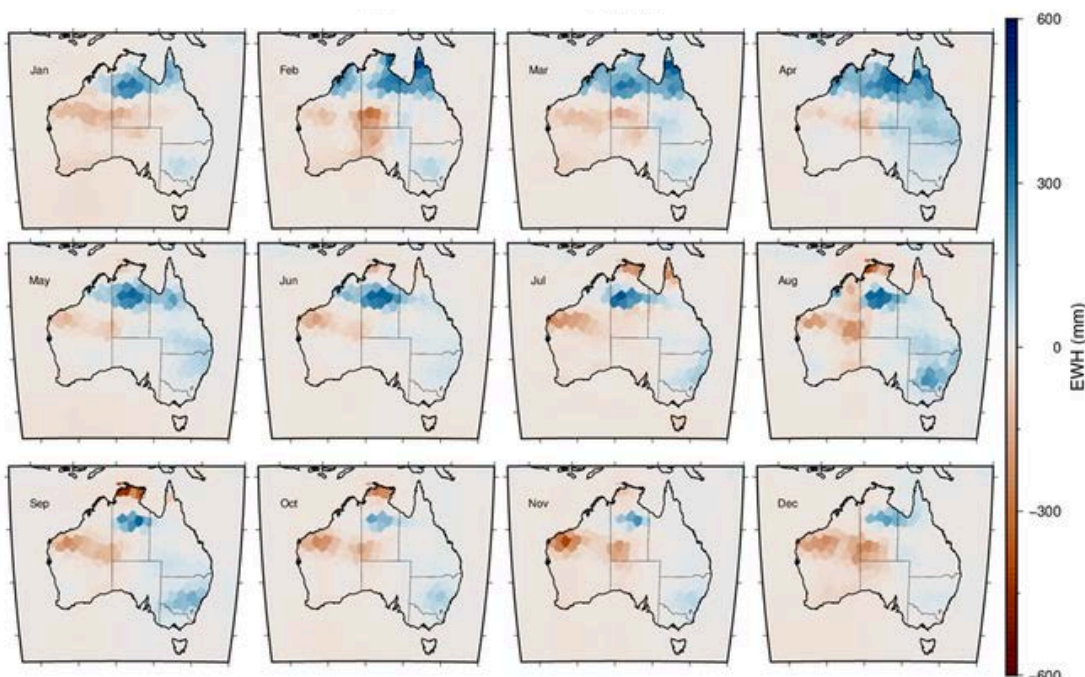
**Academic members** Prof. Nerilie Abram, Dr. Sebastien Allgeyer, Dr. Yuhao Dai, Dr Lizzie Ellison, Prof. Michael Ellwood, Prof. Stewart Fallon, Dr. Georgy Falster, Dr. Chris Gouramanis, Dr. David Heslop, Dr. Chiara Holgate, Dr. Wilma Huneke, Dr. Laura Jimenez, Dr. Andrew Kiss, Dr. Simon McClusky, Dr. Rebecca McGirr, Dr. Herb McQueen, Dr. Nicola Maher, Dr Louise Maubant, Dr. Adele Morrison, Dr. Bradley Opdyke, Dr. Anthony Purcell, Prof. Andrew Roberts, Prof. Eelco Rohling, Dr. Callum Shakespeare, Dr. Kial Stewart, Dr. Luwei Yang, Prof. Jimin Yu, Emeritus Prof. Stephen Eggins, Emeritus Prof. Ross Griffiths, Emeritus Prof. Brad Pillans

## Geodesy Group

The Geodesy Group diversified the research focus in 2025 to include the analysis of data from the Surface Water and Ocean Topography (SWOT) mission and the significant research project of modelling groundwater. The latter project involves developing a new module for the G-ADOPT software, which has now been released publicly.

The first quantification of the accuracy of water surface elevation estimates in Australia using SWOT data was published in January 2025 (Maubant et al., 2025), which led to the development of a new project to assess flood levels and environmental flows into wetlands in Australia. This work, led by two undergraduate students (Mia Callaway and Maya Taib), is currently under review at Nature Communications Earth and Environment (Callaway et al., 2025).

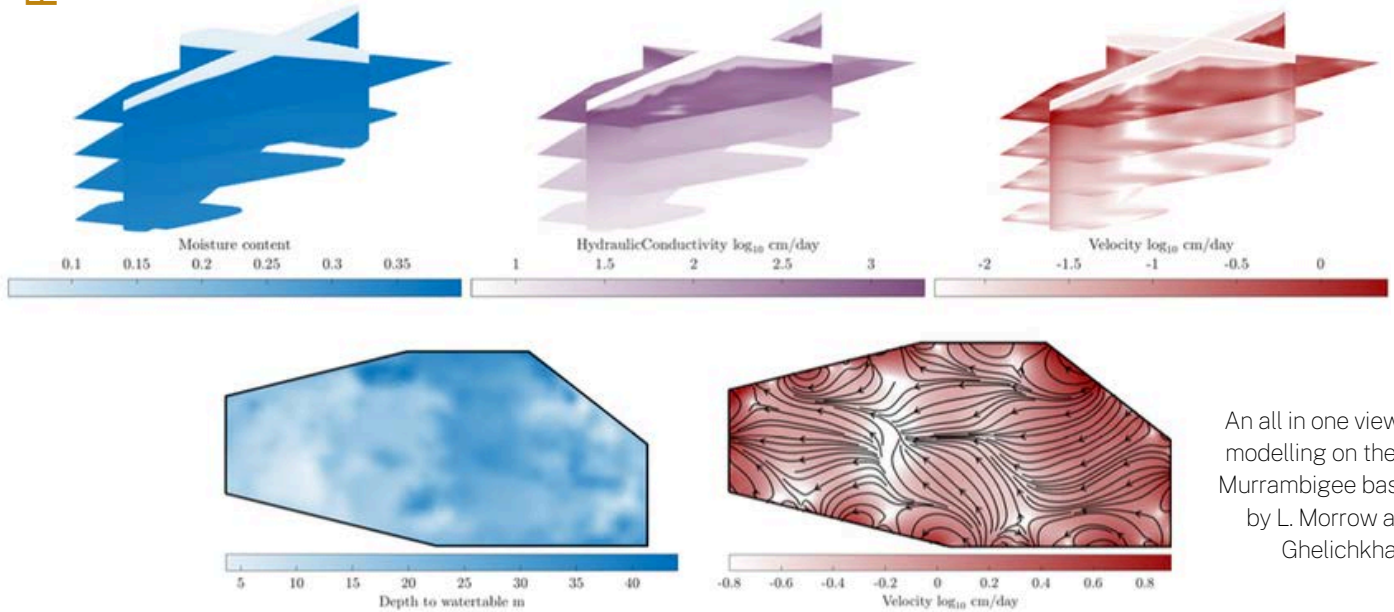
Ongoing analysis of space gravity data continues in the group showing, for example the changes in water availability across Australia during 2025. Dr Rebecca McGirr returned from maternity leave in October 2025 on a part-time basis to continue her research on the estimation of mass balance change of Antarctica.



Changes in total water storage across Australia (expressed as an equivalent water height (EWH) in mm) each month, relative to a mean value over 2004-2010. The drying of the continent in December is clearly evident, especially over Western Australia.

Climate & Ocean Geoscience - Geodesy Group (continued)

Dr Siavash Ghelichkhan and postdoctoral researcher Dr Liam Morrow successfully implemented the first adjoint-ready Richards equation solver for groundwater inversion within the G-ADOPT framework. This work completed and released the  $\Omega$  (Omega) module of G-ADOPT, which provides groundwater flow simulation capability using a discontinuous Galerkin formulation of the Richards equation. The solver has been developed under the SmartSat CRC project From Space to Ground: Modelling Australia’s Water Dynamics, co-led by Prof. Paul Tregoning and Dr Ghelichkhan, and is being reported quarterly to the CRC. The modelling is now being extended in collaboration with the Bureau of Meteorology to deliver a continental-scale groundwater data assimilation system, with integration activities commencing in early 2026.



An all in one view of the modelling on the Lower Murrumbidgee basin done by L. Morrow and S. Ghelichkhan

Analysis of the GRACE Follow-On space gravity data continued in 2025, with ongoing funding from AuScope provided through a contract with Geoscience Australia. Data through to August 2025 have been analysed, with the processing schedule dependent upon the release of the Level-1B data by NASA. The analysis shows a persistent increase in water in the Northern Territory, while eastern Australia is drying out. Antarctica has resumed losing mass after a few years of mass increase.

A new direction of research is now being pursued in the Geodesy Group which involves analysing data from the SWOT (Surface Water and Ocean Topography) satellite mission. The SWOT satellite data provides estimates of water surface elevation, which can be used to quantify changes in surface water in rivers, lakes, dams and on-farm storage systems. An initial study by Maubant et al. (2025) quantified, for the first time, that the level of water height accuracy achievable from SWOT data was ~3-10 cm for water bodies around 500 m to 40 m, respectively. Undergraduate students Mia Callaway and Maya Taib used SWOT data to quantify flood depths and environmental flows in wetlands in Australia (Callaway et al., 2025), while PhD student Lachlan Dodd has used SWOT data to study the September 2025 flood in the Punjab region of Pakistan, as well as the May 2025 floods in southwest Queensland. The latter flood has seen over 10,000 Gigalitres of water flow through the channel country, ultimately filling Lake Eyre several weeks later.

Kit Leong (PhD student) has continued to unravel the complexities of combining GRACE Follow-On space gravity observations with ICESat 2 satellite altimetry estimates of ice heights over Antarctica. The work is revealing that significant improvements in accuracy and spatial resolution of space gravity estimates of mass change can be achieved through the combined analysis; however, the altimetry observation dataset has its own unique errors (sampling biases, firn compaction issues etc) that require careful consideration. The work is being prepared for publication and will form part of her PhD thesis.

## Climate & Ocean Geoscience - Geodesy Group (continued)

The work of Guadalupe Alvarez (M. Phil. student), on assessing the accuracy of glacial isostatic adjustment models, was published in *Geophysical Research Letters* (Alvarez Rodriguez et al., 2025). This now provides the glacial isostatic adjustment community with a tool – including python code – to determine the error in modelled present-day uplift rates, anywhere on Earth where there is a measured time series of changes in height of the Earth's crust.

### Staff News

- Dr Louise Maubant left the group in February 2025 to take up a position at the Earthquake Research Institute in Japan
- Dr Anthony Purcell's contract came to an end in May 2025
- Dr Rebecca McGirr went on maternity leave from February to October 2025

### Emeritus, Honorary staff and Visitors in the group and their contributions

- Emeritus Professor Kurt Lambeck continues to undertake research into glacial isostatic adjustment signals and models.

### Outreach activities & Service roles external to ANU

- Professor Paul Tregoning became Deputy Director of the Australian Centre of Excellence in Antarctic Research (ACEAS) in July 2025.

## Climate &amp; Ocean Geoscience

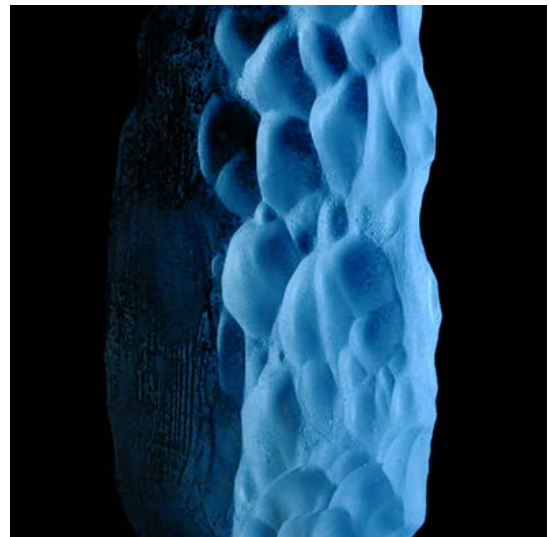
## Climate and Fluid Physics

Climate and Fluid Physics research highlights this year include a number of major review papers. Chiara Holgate led a Nature Communications review into the mechanisms behind Australian droughts and how these differ significantly across the continent. Nicola Maher second-authored a Nature Partner Journal Climate Action paper, building a framework to quantify the regional and global climate impacts of individual fossil fuel projects as a mechanism to support more informed decision-making by policy makers. PhD Student Claire Yung led a 28-author article summarising results from the international Ice Shelf - Ocean Model Intercomparison Project now under review with The Cryosphere. We congratulate Claire on what is an incredible contribution for a PhD student!

In non-publication news, Nicola Maher was selected as a Contributing Author for the Seventh Assessment Report of the IPCC. This marks the start of multiple years of work with the full report not due to be completed until 2028! Andrew Kiss, in collaboration with other group members, ACCESS-NRI and the wider ocean modelling community, has supported the release of a 'beta' version of Australia's next generation global ocean-sea ice model (known as ACCESS-OM3). This model has a number of new features which make it superior to the previous generation of models. Relatedly, Kial Stewart has led the development of a new apparatus to simulate ice cavities in the laboratory. This work has been carried out in collaboration with Prof. Anna Wåhlin (Gothenburg University, Sweden) who recently published sonar observations of mysterious shapes on the underside of ice shelves which these laboratory experiments seek to explain.

On the topic of ice, we also acknowledge the PhD completion of Jim Sweetman, whose work in the laboratory over the past 4 years has sought to better understand the complex finescale fluid processes governing the melting of ice shelves (see Figure 1). We also congratulate Ashley Barnes on successful completion of his PhD. One especially notable outcome from his candidature has been his development of a Python package for the automated generation of regional ocean model configurations. This has been so well-received that it has now been adopted and supported by the ACCESS-NRI as national software infrastructure: amazing work Ashley!

An example of the complex ice shapes sculpted by finescale fluid processes. These centimetre-scale processes control the melting rate of the Antarctic ice shelves and ultimately global sea level. See Jim Sweetman's Geophysical Research Letters article for more details.



## Staff news

- New staff:
  - Marvin Seow, Postdoctoral Fellow with ARC Centre of Excellence for Weather of the 21st Century
  - Deepashree Dutta, Research Fellow with the National Environmental Science Program Climate Systems Hub
  - Julia Neme, Postdoctoral Fellow
  - Paola Corrales, Software Engineer with ARC Centre of Excellence for Weather of the 21st Century
  - Kelly Lawler, Node Admin with ARC Centre of Excellence for Weather of the 21st Century
- Promotions:
  - Nicola Maher promoted to Level C
  - Callum Shakespeare promoted to Level D

## Climate &amp; Ocean Geoscience - Climate and Fluid Physics (continued)

**Student news**

- Completions:
  - Ashley Barnes, PhD
  - Jim Sweetman, PhD
  - River Shaddock, Honours
  - Katja Curtin, Honours
  - Blake Xu, Masters

**Grants awarded**

- Claire Yung, ANU Hansen Scandinavian Friendship Travel Grant (\$5k)
- Anupiya Ellepola, Mervyn and Katalin Paterson Travel Fellowship (\$7.5k)

**Emeritus, Honorary staff and Visitors**

- Emeritus and long-term visitors:
  - Prof. Em. Michael Roderick remains an active contributor and mentor to the CFP group.
  - Long-term visitor Dr. Dave Hutchinson (UNSW) actively contributes to research and supervision in the CFP group.
- Notable shorter term visitors:
  - Jan-March 2025. Prof. Anna Wåhlin (University of Gothenburg, Sweden) visited the CFP group to utilise the unique facilities provided by the Climate and Fluid Physics laboratory to conduct rotating ice-ocean interaction experiments in collaboration with Kial Stewart and Callum Shakespeare.
  - July 2024-June 2025. Prof. Brian Arbic (University of Michigan, USA) visited the CFP group on sabbatical.
  - December 2024 - February 2025. Mr. Thomas Schmaltz (University of Sydney) visited the CFP group as a summer research scholar on a CoE 21st Century Weather scholarship. Tom ran a suite of experiments in the CFP Laboratory investigating standing Rossby Wave dynamics with the Large Rotating Annulus. The experiments that Tom completed have contributed to two manuscripts currently under review at the Journal of Climate and the Journal of Geophysical and Astrophysical Fluid Dynamics.
  - May-August 2025. Mr Julien Magaud (École Nationale Supérieure de Techniques Avancées - Paris) visited the CFP group for an international research internship as part of his Master's program. Julien performed a set of experiments investigating transient Rossby Waves with the Large Rotating Annulus in the CFP Laboratory.
  - May-August 2025. Ms Simar Randhawa (Ashoka University) visited the CFP group as a Future Research Talent (FRT) scholar. Simar ran a suite of experiments in the CFP Laboratory exploring the effects of double-diffusion on gravity currents.
  - November 2025. Mr. Simon Heselschwerdt (Climate Service Centre Germany/University of Potsdam) visited the CFP group as part of a collaboration with Dr. Chiara Holgate. Simon presented his research on future changes to precipitation and water resources to the CFP group.

## Climate &amp; Ocean Geoscience - Climate and Fluid Physics (continued)

**Outreach activities & Service roles**

- England, M. H., Sen Gupta, A., Kiss, A. E., and Li, Z. (2025b). Unprecedented heat in the North Atlantic Ocean kickstarted Europe's hellish 2023 summer. Now we know what caused it. The Conversation.
- Callum Shakespeare was interviewed by Region about dredging operations in Batemans Bay: <https://region.com.au/sand-dredging-will-be-a-constant-task-for-batemans-bays-beaches/921549/>
- Andrew Kiss: invited lecture, East African Institute for Fundamental Research (EAIFR), University of Rwanda, Kigali
- The CFP Laboratory broadcast a series of live remote workshops on various aspects of climate dynamics. These included a graduate workshop on atmospheric dynamics for the University of Tokyo, a set of undergraduate demonstrations for students at the University of Melbourne, and general climate dynamics for high school students enrolled in the Finnigan School of Distance Education.
- The CFP Laboratory hosted several groups visiting the ANU campus, including the Curious Minds, National Youth Science Forum, Earth & Environment Science Olympiad, Physics Olympiad, and the ANU STEM Enrichment Days for Tuggeranong Primary School students.
- Holgate, C.M. and Gallant, A. (2025). Why is southern Australia in drought – and when will it end? The Conversation.
- Chiara Holgate was interviewed by the ABC, Sydney Morning Herald and 2GB radio about the drought in southern Australia.
- Chiara Holgate presented extreme rainfall research to over 50 external stakeholders including state environment departments, WaterNSW, Sydney Water and Hunter Water.

## Climate & Ocean Geoscience (continued)

### Palaeo- and Environmental Magnetism - Roberts

In 2025, the Palaeo- and Environmental Magnetism research group pursued a wide range of research topics. Work continued on palaeomagnetic analysis of lake sediment cores from Western Victoria as part of ARC Discovery Project DP220102167. This included two new cores from Lake Bullen Merri. This research is part of a wider collaboration with the University of Melbourne to reconstruct Australian palaeosecular variation of Earth's magnetic field during the Holocene.

Work continued with collaborators from the Australian Centre for Excellence in Antarctic Science (ACEAS) to develop a multifaceted approach to marine sediment core age control and correlation. This research is focused on marine sediment cores collected as part of the CANYONS voyage to Cape Darnley region of East Antarctica. As part of a separate ACEAS project work also continued to estimate Cenozoic climate background state dependence in climate sensitivity. This work will help to understand past climate changes and inform long-term future climate change scenarios.

Our long running collaboration with Prof. Yusuke Yokoyama from the Atmosphere and Ocean Research Institute, The University of Tokyo, continued in 2025. We are investigating rapid changes in the geomagnetic field and how such changes control Earth's vulnerability to extreme space radiation.

#### Establishing a Statistical Framework for Assessing Paleomagnetic Data Quality

Paleomagnetic analysis is used to investigate Earth's past magnetic field by studying magnetizations preserved in rocks, sediments, and other geological materials. These magnetizations provide insights into Earth's natural processes, including plate tectonics, and aids understanding of planetary magnetic field history and geological changes over time. In paleomagnetic analysis, researchers study the magnetic properties of geological materials by gradually removing their natural remanent magnetization. This process helps to identify and measure relevant magnetic components and their relationship to their geological context. Such evaluation typically involves using principal component analysis to fit lines to experimental data to identify linear magnetization components. The quality of these fits is evaluated using a measure called the maximum angular deviation (MAD), which indicates directional uncertainty and helps to identify usable or unusable specimens. In 2025 we published a new approach based on a statistical test to assess if paleomagnetic data are distributed randomly based on their MAD. This statistical framework offers an initial assessment of paleomagnetic data quality before undertaking more in-depth analysis.

#### Magnetic Domain State and Anisotropy in Monoclinic 4C Pyrrhotite ( $\text{Fe}_7\text{S}_8$ ) From First-Order Reversal Curve Diagrams

First-order reversal curve (FORC) diagrams are a standard method for identifying the domain state and magnetic anisotropy type of magnetic materials. These properties control the magnetic recording capability of magnetic minerals, so identifying them is fundamental to paleo-, rock-, and environmental-magnetic studies, and it is important to have extensive FORC reference data for all minerals studied from natural samples. Pyrrhotite ( $\text{Fe}_7\text{S}_8$ ) is a naturally abundant magnetic mineral with only limited FORC reference data. We published FORC diagrams for known size fractions of diverse natural samples to explain key domain state and anisotropy signals for pyrrhotite.

#### Staff News

Dr Yao Qian, who worked with the Palaeo- and Environmental Magnetism research group for several years, left RSES in 2025 and has commenced a new role in the ANU College of Science and Medicine.

## Climate &amp; Ocean Geoscience - Palaeo- and Environmental Magnetism (continued)

**Student News**

Catherine Smith and Jess Biddle commenced their PhDs in 2025. They are currently on extended research stays, working at the University of Tokyo's Atmosphere and Ocean Research Institute with Prof. Yusuke Yokoyama.

**Emeritus, Honorary staff and Visitors**

Prof. Yusuke Yokoyama from the Atmosphere and Ocean Research Institute, The University of Tokyo, visited the Palaeo- and Environmental Magnetism as a Partner Investigator in the Australian Centre for Excellence in Antarctic Science. Yusuke is working with Dave Heslop on rapid changes in Earth's magnetic field and our vulnerability to space radiation. Together they also planned joined teaching activities between ANU and the University of Tokyo.

Dr Chris Klootwijk is a long-term RSES visitor in the Paleo- and Environmental Magnetism research group. Chris is working on plate tectonic reconstructions with a particular focus on Australia's role in a mid-Carboniferous inertial interchange true polar wander event.

Dr Miaomiao Shen from Institute of Tibetan Plateau Research, Chinese Academy of Sciences visited RSES throughout 2025 to continue her research into magnetotactic bacteria.

Prof Yen-Hua Chen from the Department of Material Sciences and Engineering, National Tsing Hua University, Taiwan visited the Palaeo- and Environmental Magnetism as part of several ongoing research projects.

**Staff News**

- Promotions:
  - Nerilie Abram was promoted to Level E2 professor at the ANU.
  - Nicola Maher was promoted to level C.
  - Callum Shakespeare was promoted to level D.
- Dr. Adele K. Morrison is the 2025 IAPSO Early Career Scientist medallist in physical oceanography. This is awarded in recognition of her groundbreaking contributions to Southern Ocean dynamics, particularly her work on the role of mesoscale eddies in governing ocean circulation, the transport of heat and carbon, and the interaction between ocean currents and Antarctic ice shelves.
- Professor Nerilie Abram accepted the prestigious position of Chief Scientist of the Australian Antarctic Program. She took up the Chief Scientist posting in August.

Patrick De Deckker has continued to research in 3 fronts: 1. History of the oceans in the Australian region; 2, fingerprinting airborne dust in Australia through the study of deep-se cores; 3. Identifying if planktic foraminifera distribution is controlled by salinity.

Patrick has also self-published a book entitled: "The Belgica expedition 1897-1899. The first expedition to winter in Antarctic water. Of relevance to environmental change ". Soon to be published by Amazon US. ISBN 978-1-970479-01-0. The book consists of 296 pages and 190 illustrations, mostly in colour.

# GEOCHEMISTRY

**Area Head**

Prof. Andrew Berry

**Academic Members**

Dr. Olivier Alard, Dr. Yuri Amelin, Dr. Michael Anenburg,  
Prof. Jochen J. Brocks, Dr. Antony Burnham, Dr. Joëlle D'Andres,  
Dr. Marnie Forster, Prof. Trevor Ireland, Prof. Dorrit Jacob,  
Prof. Penny King, Prof. John Mavrogenes, Dr. Laura Miller,  
Dr. Laura Otter, Prof. Greg Yaxley, Dr. Qing Zhang,  
Emeritus Prof. Richard Arculus, Emeritus Prof. Vickie C. Bennett,  
Emeritus Prof. Ian Campbell, Emeritus Prof. Ian Williams,  
Honorary Prof. Lesley Wyborn

TBD

## Geochemistry (continued)

**Staff News**

- In March, the Geological Society of Australia named John Mavrogenes as a Distinguished Fellow, recognising his exceptional contributions to economic geology, leadership in the geoscience community, and influence in academia, industry and public policy. This prestigious honour highlights his remarkable career and enduring impact on the geosciences.
- Laura Miller was promoted to level B.

**Seminar presentations**

- Gibson, G.M.: Shaken not stirred: basin inversion and seismic shock as twin triggers for fluid mixing and the formation of sediment-hosted Pb-Zn deposits in Paleoproterozoic northern Australia. ANU Petrology Series, May 2025.

George Gibson continued his ongoing research programs in Paleoproterozoic Australia, including Mount Isa and Broken Hill in collaboration with Geoscience Australia and South Australian Geological Survey (self-funded).

# GEOFYSICS

**Area Head** Prof. Hrvoje Tkalčić

**Academic Members** Dr. Hamish Brown, Prof. Rhodri Davies, Dr. Thomas Duvernay, Dr. Caroline M. Eakin, Dr. Miriam Gauntlett, Dr. Sia Ghelichkhan, Dr. Mark Hoggard, Dr. Chengxin Jiang, Dr. Michael Koch, Dr. Voon Hui Lai, Dr. Fabrizio Magrini, Dr. Auggie Marignier, Dr Konstantinos Michailos, Prof. Meghan Miller, Prof. Louis Moresi, Dr. Liam Morrow, Dr. Thanh-Son Pham, Dr. Robert Pickle, Prof. Malcolm Sambridge, Dr Will Scott, Dr. Grace Shephard, Dr. Zhi Wei, Dr. Ping Zhang, Adj. Prof. Phil Cummins, Em. Prof. Steve Cox, Em. Prof. Ian Jackson, Em. Prof. Brian Kennett

## Global and Planetary Seismology Group

### Major Awards and Recognition

- Australian Laureate Fellowship awarded to Hrvoje Tkalčić - "Echoes from the Planetary Cores: Seismic Insights into Deep Worlds" (September 2025), providing AUD 3.9M from the Australian Research Council and AUD 2.75M in university support over five years. This program will revolutionize the understanding of planetary cores from Earth to Mars, the Moon, and icy moons in the outer solar system.

### Research Highlights and Discoveries

#### Planetary Seismology

- Seismic evidence of liquid water at the base of Mars' upper crust - Sun, W., H. Tkalčić, M. Malusà, and Y. Pan, published in Nature Science Review, with implications for past habitability
- New constraints on the origin of the Martian dichotomy from Southern Highlands marsquakes - Sun, W. and H. Tkalčić, Geophysical Research Letters
- Progressive Noachian crustal thickening on Mars revealed by meteorite impacts - Sun, W., H. Tkalčić, M. Malusà, L. Adam, et al., Earth and Planetary Science Letters
- Spectral characteristics of low-frequency marsquakes and impact events from InSight SEIS observations - Sun, W., H. Tkalčić, J. Chen, and S. Wang, Physics of the Earth and Planetary Interiors
- The Lunar Gravitational-wave Antenna (LGWA) mission studies and science case published in Journal of Cosmology and Astroparticle Physics (multi-institutional collaboration)

#### Global Seismology

- Complex inner core boundary beneath South America mapped - Cui, T., H. Tkalčić, W. Wang, et al., revealing possible elevated topography and fast crystallization, Geophysical Research Letters
- Detection of seismic core phases from Northern Atlantic cyclones on Australian spiral-arm arrays - Pandey, A. and H. Tkalčić, Seismological Research Letters, demonstrating storms as valuable sources for deep Earth imaging
- Microseism characteristics investigated using Australian seismic arrays - Pandey, A., H. Tkalčić, and X. Ma, Journal of Geophysical Research

## Geophysics - Global and Planetary Seismology (continued)

## Regional and Methodological Studies

- Crustal structure of the Yunnan Region, China revealed by adjoint tomography - Wei, Z., L. Zhao, H. Tkalčić, et al., *Journal of Geophysical Research*
- Macquarie Ridge Complex in 3D from full-waveform ambient noise tomography - Wei, Z., H. Tkalčić, T-S. Phạm, et al., accepted for publication in *Seismological Research Letters*
- Atlantic geometry and the Scandinavian mountains - Makushkina, A., B. Tauzin, M. Miller, H. Tkalčić, and H. Thybo, *Geology*
- Shallow Earth structure from P-wave coda autocorrelation using particle swarm optimization - Zhou, J. and H. Tkalčić, *Geophysical Journal International*
- Bayesian reassessment of seismic moment tensors in the Adriatic Sea Region - Hu, J., H. Tkalčić, T-S. Phạm, M. Herak, I. Dasović, and M. Mustać, *Seismica*
- In 2025, Dr Phạm explored the research direction in glacial seismicity in Antarctica. Phạm (2025) reported the systematic detection of glacial earthquakes, generated by the capsize of gravitationally unstable icebergs from the ocean termini of the Thwaites Glacier. The groundbreaking study could open a research program into the interplay between the solid Earth, cryosphere and the ocean in Antarctica.

## Invited Reviews:

- Global centroid moment tensor achievements and next generation earthquake catalogs - Phạm, T.-S., H. Tkalčić, J. Hu and Z. Wei, accepted for publication in *Physics of the Earth and Planetary Interiors*

Total: 14 publications in 2025 (12 published, 2 accepted)

**Public Engagement and Outreach**

## Popular science articles:

- "Mars watery underworld" - H. Tkalčić and W. Sun, *Geoscientist* magazine
- "Meteorites and marsquakes hint at an underground ocean of liquid water on the Red Planet" - *The Conversation*
- "Why is one half of Mars so different to the other? 'Marsquakes' may have just revealed the answer" - *The Conversation*
- Multiple media interviews, features with ANU Media, and coverage of deep Earth and Mars discoveries in domestic and international media outlets

Book publication: "When Worlds Quake: The Quest to Understand the Interior of Earth and Beyond" by Hrvoje Tkalčić (Princeton University Press), release January 2026 (North America) and February 2026 (Europe/UK)

## New Group Members

- Turki Moaaf (MSc student)
- Carl Martin (postdoctoral researcher)

## Current Research Team

- PhD students: Abhay Pandey, Ammu Sanjayan, Vishnupriya Pradeep, Jiarun Zhou, Yun-Ze Cheng
- Postdoctoral researchers: Zhi Wei, Carl Martin, Jinyin Hu

## Visitors

- Minog Kim
- Balthazar Dubois-Dognon

## Geophysics - Global and Planetary Seismology (continued)

## Extended Travel and Invited Presentations

- H. Tkalčić presented invited lectures, seminars, and colloquia:
  - Europe: London, Cambridge, Copenhagen, Lisbon, Madrid, Rome, San Benedetto del Tronto, Ljubljana, Sardinia
  - Asia: Tokyo, Chiba, Singapore
- Topics included deep Earth structure, seismic and correlation wavefields, Mars interior from InSight data, and the new Laureate Fellowship program.
- J. Hu presented recent papers at the IAGA/IASPEI joint meeting in Portugal.
- Son Pham - ANU Early Career Researcher Travel Grant (A\$ 3,000) supports the attendance to the Seismological Society of America's Topical Meeting on Environmental Seismology in Denver, CO from 14–18 October 2025
- Son Pham - Australian Centre of Excellence in Antarctic Science's Early Career Researcher Travel Scholarship (A\$ 1,000) supports the attendance to the ACEAS Annual Meeting in Hobart, Tasmania from 5–8 November 2025
- Son Pham - The CASS Foundation Travel Award (A\$ 4,500) supports the attendance to the AGU Fall Meeting in New Orleans, LA from 15–19 December 2025
- Son Pham - The SSA International Travel Grant (US\$ 3,300) supports the attendance to the SSA Annual Meeting in Pasadena, CA from 14–18 April 2026
- PhD Student Ammu Sanjaya - Australian Centre of Excellence in Antarctic Science's Early Career Researcher Travel Scholarship (A\$ 1,000) supports the attendance to the ACEAS Annual Meeting in Hobart, Tasmania from 5–8 November 2025

## Selected Conference Attendance

- IAGA/IASPEI Joint Scientific Meeting 2025, Lisbon, Portugal
- AUGS 2025, Singapore
- JpGU Annual Meeting 2025, Chiba, Japan

## Domestic and International Collaborations

## Active research partnerships with:

- Lauren Waszek (Australia/JCU, Deep Earth structure)
- Caroline Eakin (Australia/ANU, Macquarie Ridge Complex)
- Bram Slagmolen/Phil Cummins (Australia/ANU, TorPeDO project)
- Babak Hejrani (Australia/GA, Earthquake sources)
- Thuany Costa de Lima (Australia/GA, Deep Earth structure)
- Sheng Wang (Switzerland, Earth's correlation wavefield)
- Weijia Sun (China, planetary seismology, Mars research)
- Maurizio Mattesini (Spain, Earth's core)
- Vernon Cormier (USA, Earth's core; planetary interiors)
- Marco Malusà (Italy/Switzerland, Mars crustal evolution)
- Mila Adam (New Zealand, internal structure of Mars)
- Benoit Tauzin (France, receiver functions and deep structure)
- Croatian seismology group (Adriatic Sea seismicity)
- Chinese institutions (Yunnan crustal structure)
- Han Harms/Angela Stalone (Italy, LGWA project)
- Carlo Giunchi/Irene Molinari (Italy, Einstein Telescope project)

## Geophysics - Global and Planetary Seismology (continued)

### Events

The Geophysics area organised an event titled: Geophysics Research Showcase in the Shine Dome in October. The event was attended by over 70 researchers from RSES, RSPHys, ANU, and GA. About 30 posters sparked ideas and conversations that will shape the future of geophysics in Australia. The People's Choice award was tied between Yun-Ze Cheng and Hitank Kasaundhan, and the Student Presentation Award went to Abhay Pandey, with two commendable mentions: Alexandra Vickery and Jackson Copeland.

### Outreach

Son Pham was featured in Seismological Society of America's "At Work" column: <https://www.seismosoc.org/news/at-work-thanh-son-pham/>

In April 2025, Pham delivered a one-week workshop on "Introduction to Observational Seismology" at the Hanoi University of Science (Vietnam), sponsored by the Vingroup Innovation Foundation. The intensive workshop was attended 35 students, ECRs and colleagues from local universities and research institutions.

### Staff news

- Dr. Grace Shephard was awarded an ARC Future Fellowship.

## Observational Seismology - Miller

### Research highlights or discoveries

- Our Lake George fault zone imaging research, published on Seismological Research Letters, was highlighted by the ANU media in October 2025 [[link](#)]

### Major projects started or completed

- Hendro Nugroho, PhD thesis completed, "Deformation Study in the Arc-Continental Transition Zone of the Banda Arc Inferred from Seismic and Geodetic Data"
- SEED-Vault software package published in collaboration with AuScope AVRE, led by R. Pickle

### Staff News

- Tianwei Sun arrived in August as a COMBS CoE postdoc
- Santiago Velasquez started as a new technical officer
- Jack Dent promoted
- Sima Mousavi transitioned to an Honorary Senior Lecturer but is now employed at AuScope
- Rajesh Erigela departed for a new position

## Geophysics - Observational Seismology (continued)

### Visitors

- Associate Prof. Xin Wang from Institute of Geology and Geophysics, Chinese Academy of Sciences arrived as a Visiting Fellow in January 2025
- Associate Prof. Hongjian Fang from Sun Yat-Sen University

### Fieldwork

- Ōkātina caldera of the North Island of New Zealand in collaboration with Victoria University of Wellington with C. Jiang and M. Miller
- Expansion of 6 new semi-permanent seismic stations installed for the M8 network across Australia led by R. Pickle
- Installation of permanent sensor in the Stawell Underground Physics Laboratory 1km below ground (M8.SUPL) led by Mousavi/Pickle
- SAMWISE project (Southern Alps Monitoring of Weather-Influenced Seismology and Erosion) deployment at Aoraki/Mount Cook, NZ led by K. Michailos in November 2025
- SNAKEY project (Seismic Network Around Kangaroo Eye York, Eakin/Pickle) service by Santiago Velasquez and Jack Dent
- Completion of the FISSLE DAS experiment in Milford Sound, NZ in February 2025

### Extended travel and outcomes

- P. Zhang was invited to visit Strasbourg Earth & Environment Institute | ITES, University of Strasbourg in France
- P. Zhang visited Sun Yat-sen University (SYSU) in China for research collaboration.
- V.H. Lai and M. Miller visited Victoria University of Wellington in March 2025 as part of research exchange through Royal Society Te Apārangi Catalyst Fund (between VUW, ANU, and TU Dortmund).

### Selected conference attendance

- P. Zhang, M. Miller, and S. Mousavi travelled to Lisbon, Portugal to present at IAGA/IASPEI Joint Scientific Meeting 2025.
- M. Miller, C. Jiang, S. Dong and P. Zhang will travel to Auckland, New Zealand to present new results from New Zealand focused experiments on 2025 Geoscience Society of New Zealand conference.
- V.H. Lai and K. Michailos gave presentations on distributed acoustic sensing results from New Zealand experiments on the Alpine Fault, coastal processes and avalanche monitoring at the Seismological Society of America Environmental Seismology workshop in October 2025.

## Observational Seismology - Eakin

2025 was a year of significant progress across multiple projects in C. Eakin's group in observational seismology.

### CRC-P Program Completion

Our CRC-P program, "Accelerating exploration and extraction of renewable natural hydrogen", a collaboration with H2EX Technologies, the University of Adelaide, and ANU (C. Eakin, L. Moresi, C. Jiang, M. Miller), concluded in 2025. This pioneering initiative advanced understanding of natural hydrogen systems, delivering a regional-scale 3D geodynamic model for the Eyre Peninsula, high-resolution crustal imaging, and identification of drillable targets. The project produced world-first outcomes integrating ambient noise tomography (ANT) and magnetotellurics (MT), laying a robust scientific foundation for Australia's emerging natural hydrogen industry.

## Geophysics - Observational Seismology (continued)

### WA-Array Expansion and First Publication

Our collaboration with the Geological Survey of Western Australia on the WA-Array project continued throughout 2025 and saw the publication of the first research outputs from this ambitious program (e.g. Phase 1 report). Using this dataset, Miriam Gauntlett published our first WA-Array study in *Geochemistry, Geophysics, Geosystems*, revealing ENE-trending lithospheric architecture linked to Archean Yilgarn Craton formation. In 2025, the second phase of data collection extended coverage from the Eastern Goldfields to Geraldton, with current collaborative work ongoing to analyse this expanding dataset.

### SNAKEY Broadband Deployment

The SNAKEY network (Seismic Network Around Kangaroo Eyre Yorke) continued operating across the southeastern margin of the Gawler Craton, filling a critical gap in Australia's seismic coverage. The first paper using SNAKEY data (O'Donnell et al., *Seismica*, 2025) provided new insights into the deep lithospheric structure of the South Australian Craton via teleseismic Rayleigh wave tomography. Further analyses of regional seismicity and shear-wave splitting are currently ongoing.

### Characterising Sediment Thickness– U.S. Expansion

Building on previous work characterising sediment thickness across Australia, Auggie Marignier extended this approach to the contiguous United States. The study, published in *Seismological Research Letters* in 2025, produced the first consistent sediment thickness map for the U.S. leveraging the uniform station spacing of the Transportable Array. This work attracted significant attention, including a feature by EarthScope, highlighting its implications for seismic hazard assessment and seismic tomography.



CRC-P Workshop between project partners: H2EX, ANU, and University of Adelaide (Perth, February 2025).

### Staff News

- Dr Auggie Marignier – departed to join University of Oxford as a Schmidt AI in Science Fellow
- Mr Saami Wallenius – spent 3 months (Jan-Mar) in the group as a Research Assistant

### Student News

- Leon Bilton was awarded his MPhil degree and took up a Senior Data Analyst position at DCCEEW.

## Geophysics - Observational Seismology (continued)

Emeritus, Honorary staff and Visitors in the group and their contributions

- Sankarshan Mondal was a visiting student from IISER Kolkata under the Future Research Talent program studying shear-wave splitting beneath the SNAKEY array.
- Shivika was a visiting intern from IIT Roorkee, studying Quasi-Love wave scattering with the WA-Array. Shivika will return in 2026 under the HDR program.

Extended travel and outcomes

- C. Eakin gave a seminar at the University of Oxford and presented at the EGU General Assembly in Vienna on passive seismic imaging for natural hydrogen exploration.
- C. Eakin attended the AGU Annual Meeting in New Orleans and presented work on behalf of the group including the studies of Marignier et al., 2025, Gauntlett et al., 2025, O'Donnell et al., 2025, and preliminary results from SNAKEY.

Outreach activities & Service roles external to ANU

- C. Eakin gave an interview for the Wonder Podcast by GeoCo: '[Rock Bottom of the Australian Continent](#)' – amassing over 1.3K views on YouTube

## Computational and Observational Geodynamics

**Faculty & Researchers:** Rhodri Davies, Hamish Brown, Thomas Duvernay, Sia Ghelichkhan, Angus Gibson (Research Software Engineer), Mark Hoggard, Stephan Kramer, Liam Morrow, Dale Roberts (Research Software Engineer), Will Scott, Grace Shephard.

**Graduate Students:** Riik Basu (PhD), Haining Chang (PhD), Jackson Copeland (PhD), Jabir Hussain (PhD), Shihao Jiang (PhD), Edgar Leong (PhD).

**Masters Students:** Anastasia Morfiadakis.

**Visiting & Honours Students:** Peng Zhang (China University of Geosciences, Beijing); Max Etherington, Ruby Hackett, Kat Simeonoff (ANU Honours).

## Research Highlights

Building on last year's momentum in community software and data-informed geodynamics, our 2025-2026 research combined methodological advances (particularly adjoint-enabled modelling) with high-impact applications spanning solid Earth deformation, mantle dynamics, magmatism, plate tectonics, and coupled Earth system processes. A key enabling factor across these themes was major progress in the G-ADOPT platform (<https://gadopt.org/>), supported by national supercomputing allocations and sustained co-development with the Firedrake and pyadjoint communities. This year also brought major recognition for our people: Grace Shephard secured an ARC Future Fellowship (FT25), and Sia Ghelichkhan received the 2026 European Geosciences Union Outstanding Early Career Scientist Award, underscoring the group's international standing and the leadership role our team is playing in next-generation geodynamic modelling.

## Geophysics - Computational and Observational Geodynamics (continued)

*Adjoint-enabled viscoelastic Earth deformation, GIA and sea-level science*

A major focus this year was advancing computational approaches for glacial isostatic adjustment (GIA) and solid Earth deformation, with an emphasis on automation, reproducibility, and scalability. Scott et al. (2025) present an integrated forward and adjoint modelling capability for viscoelastic deformation, thereby strengthening the foundations for rigorous inverse problems in GIA, sea-level change, and ice-sheet-driven loading. These developments are complemented by applications that help disentangle coupled signals in Earth system observations, including Parazin et al. (2025) on how dynamic topography shapes inferences about ice-sheet evolution, and Ghelichkhan et al. (2025) on closing the budget of 20th-century true polar wander using adjoint-enabled mantle-flow reconstructions in combination with independent GIA models. Together, these studies improve our ability to separate and quantify intertwined solid Earth and surface signals, a central challenge for interpreting sea-level records and forecasting future change.

*Deep mantle structure, composition, and plume-related dynamics*

Several papers this year sharpen our understanding of mantle heterogeneity and the physical meaning of geophysical observables. Leung et al. (2025) provide a quantitative assessment of tomographic proxies for lowermost mantle composition and mineralogy, directly addressing how seismic images can be reliably translated into compositional and thermochemical interpretations. Complementing this, Pilia et al. (2025) highlight the possibility of “ghost plumes” hidden beneath continents, pushing the community to rethink where and how plume-related upwellings may be expressed at the surface. Sternai et al. (2025) extend this theme into the orogenic realm, proposing mantle support mechanisms beneath the Himalayan-Tibetan system that connect deep processes to surface uplift and long-wavelength topography. Collectively, these contributions support our long-term goal of producing data-driven reconstructions of dynamic topography through the Cenozoic and into deep time, and assessing these against disparate geological and geophysical observations.

*Coupled geodynamics-geochemistry and mantle melting processes*

We continued to strengthen coupled interpretations of mantle dynamics and geochemical observations. Jiang et al. (2025) (Part 2) use geodynamical simulations to interrogate the “lid effect” on ocean island basalt generation, advancing a unified physical explanation for observed geochemical trends by linking melt generation to lithospheric and mantle dynamics. In parallel, Bilton et al. (2025) introduce PyDRex, a tool for predicting crystallographic preferred orientation (CPO) in peridotites under both steady-state and time-dependent strain, strengthening the bridge between deformation histories, seismic anisotropy, and mantle flow. These developments complement our broader effort to link mantle evolution more formally to geochemical datasets, building towards next-generation inversions and reconstructions that integrate physics with geochemical and petrological constraints.

*Plate tectonics, rifting, and Arctic-North Atlantic evolution (and major fellowship success)*

Work led by Shephard and collaborators delivered major advances in reconstructing and modelling complex plate boundary evolution over long timescales. Shephard et al. (2026) develop multi-phase intra-plate rifting and deformable plate modelling of the Northeast Atlantic back to the Permian, providing a coherent kinematic and geodynamic framework for a region central to understanding plume-lithosphere interactions and basin evolution. This research momentum was strongly reinforced by Grace Shephard securing an ARC Future Fellowship (FT25, AUSTRALIS - Deep time evolution of mineral systems in the Tasmanides), a major achievement that will expand our capability to integrate plate reconstructions, geodynamics, and mineral system evolution across deep time. Grace’s broader Arctic-focused syntheses and community outputs (including Smyrak-Sikora et al., 2025; Williamson et al., 2026; Jakobsson et al., 2025; and the SVALGEOL community outputs in 2025-2026) further strengthen the geological and paleoclimatic context needed to connect deep Earth dynamics to sedimentary, tectonic, and climatic archives.

Geophysics - Computational and Observational Geodynamics (continued)

*Coupled atmosphere-ocean forcing of Australian coastal extremes*

A smaller but notable strand of work led by Roberts and colleagues addressed the drivers of Australian regional climate variability and extremes, with a focus on coastal rainfall and cyclone intensification. Dao et al. (2025) quantify the joint role of local and large-scale forcings in modulating coastal rainfall in northeast Australia, while Chambers et al. (2025) examine how Coral Sea sea-surface temperatures influence warm-core intensification of Tasman Sea cyclones. A related high-resolution modelling effort (Huang et al., 2025, submitted/preprint) contributes to the AUS2200 framework, underscoring the broader relevance of robust modelling workflows for environmental and hazard-relevant applications.

*Platform and community impact: G-ADOPT now underpinning three major research domains*

Across these themes, continued maturation of the G-ADOPT platform underpinned scientific progress and enabled new classes of data-driven geoscientific problems. G-ADOPT has now become a core research engine for the group across three major domains: (i) mantle and lithosphere dynamics, where it supports high-fidelity forward models and emerging data-assimilation and inversion workflows; (ii) glacial isostatic adjustment and cryosphere-solid Earth coupling, where adjoint-enabled viscoelastic modelling provides a pathway to quantitative inversion using geodetic, geological, and sea-level observations; and (iii) national groundwater modelling, where new geophysical fluid-dynamical modules are being developed and deployed through the OMEGA project and related partnerships. NCMAS and ANUMAS-supported development advanced numerical and algorithmic capabilities, including high-order time integration (through coupling with IRKsome), improved treatment of material boundaries (via level-set methods), and scalable workflows for both forward and adjoint modelling. These advances have attracted substantial new investment, including \$1.4M from AuScope through the NCRIS Coastal Research Infrastructure initiative and over \$0.5M from the SmartSat CRC, and are reflected in an expanding global user community and strong domestic engagement (including major national workshops in 2025 supported by ACEAS and AuScope).

Sharing G-ADOPT at the Shine Dome via Ghelichkhan at the 2025 Auscope meeting. Photo: Shephard



## Geophysics - Computational and Observational Geodynamics (continued)

Overall, the 2025-2026 outputs demonstrate a coherent strategy: invest in scalable adjoint-capable computational infrastructure; apply it to high-priority inverse and interpretation problems in GIA, sea-level change, and global-scale geodynamics; and connect deep Earth processes to surface evolution through integrated modelling, synthesis, and community datasets.

### Funding & Collaborative Partnerships

- Industrial Research Partnership (\$1.6M AUD) via the Rio Tinto Centre for Future Materials. GEM-Cu: Geodynamic Environments for Mineralisation of Cu (Copper).
- ARC Discovery Project - DP250101119. Volcanoes on Ice: Mantle influence on Antarctic Ice Sheet Inception and Evolution.
- Future Fellowship - FT25 "AUSTRALIS - Deep time evolution of mineral systems in the Tasmanides". G. Shephard (\$1,120,000 AUD)
- Geoscience Australia Partnership: Supporting geodynamic context for regional mineral systems and sea level rise.
- Ongoing ACEAS Funding: Advancing sea-level change quantification.
- AuScope (CoastRI Initiative, 4 years): Enhancing research software infrastructure for connecting land and sea.
- Supercomputing Resources: The group received over 50 million service units (MSU) on national supercomputing facilities via the NCMAS and ANUMAS schemes, reinforcing our national computing leadership and underpinning our research over the coming 12 months.
- PHC FASIC 2025 - 5-week visit to the University of Montpellier (Duvernay).

### Staff & Student News

#### Arrivals & Departures

- Grace Shephard joined us formally as a staff member via her ARC Future Fellowship.
- Hamish Brown joined the group as a post-doc following successful completion of his PhD at LMU Munich. Shihao Jiang completed his PhD (no corrections) and moved into a post-doc at the university of Tasmania.

#### Student Achievements

- GSA AESC Student Bursary (Etherington).
- First major conference (Etherington, Simeonoff,).
- PhD Completion (Jiang).
- PhD confirmation of candidature (Basu, Chang, Copeland, Hussain)

#### Outreach & Engagement

- Keynote Presentations:
  - ACEAS Research Forum 2025 (Davies)
  - International Conference on Arctic Margins (ICAM-X) 2025 (Shephard)
- Conference Presentations:
  - EGU25 (Brown, Davies, Duvernay, Ghelichkhan, Shephard)
  - Glacial Isostatic Adjustment Workshop 2025 (Online) (Scott)
  - ACEAS Research Forum 2025 (Scott)
  - AuScope Research Conference 2025 (Ghelichkhan, Scott, Shephard)
  - AGU25 (Jiang)
  - Firedrake 25 (Gibson, Kramer)
  - SEG 2025 (Hoggard, Leong)
  - AESC 2026 (Davies, Hoggard, Scott, Ghelichkhan, Chang, Leong, Morrow)
  - Australian Fluid Mechanics Conference 2026 (Morrow)

Geophysics - Computational and Observational Geodynamics (continued)

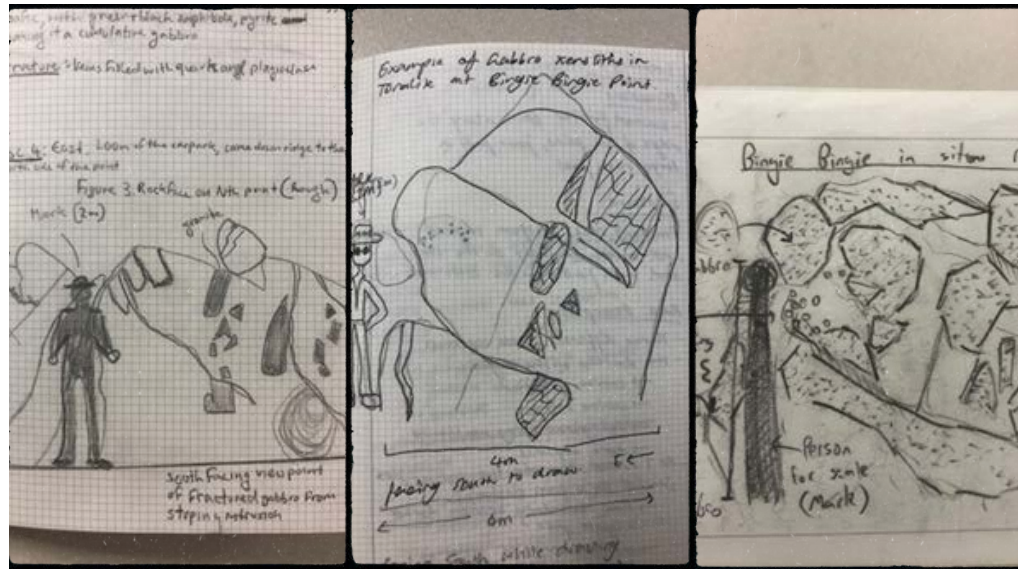
University Visits:

- Imperial College London (Gibson, Hoggard, Scott)
- University of Montpellier (Duvernay)
- University of Lyon & ENS Lyon (Duvernay)
- University of Tasmania (Duvernay, Jiang)
- California Institute of Technology (Jiang)
- Adelaide University, University of Sydney, Durham, Cambridge (Hoggard)
- ETH, Zurich (Ghelichkhan)
- LMU Munich (Ghelichkhan)
- University of Sydney (Brown)

Fieldwork:

- Zillmere GSQ core shed (Leong)
- EMSC1008 South Coast field trip (Hoggard, Leong)

Mark Hoggard features in EMSC1008 student notebooks as a 2-m scale.



Jonah Woodcock and Edgar Leong breaking core cutting records and not breaking any equipment at the Zillmere GSQ core shed. Photo: Edgar Leong

Geophysics - Computational and Observational Geodynamics (continued)

Public and STEM Engagement & Events:

- ANU Open Day (2025) (Etherington, Scott)
- G-ADOPT workshop (Everyone)
- ANU Summer 9s Mixed Football (Team: Tangerine Trilobites) (Bilton, Copeland, Duvernay, Leong, Ghelichkhan, Scott, Shephard)
- School visits, e.g. Moruya High, Telopea Park (Shephard)
- Australian Earth Science Olympiad Summer School
  - Guest lecturer (Shephard)
  - Senior mentor/lecturer (Etherington)
- Curious Minds - girls in STEM 8-month mentoring (Shephard)
- StemPals - Grade 5 & 6 pen pal letter exchange (Scott, Shephard)

Service and community:

- WOMEESA (Women in Earth and Env. Sciences in Australasia)
  - National Committee, Awards and Recognition Officer (Shephard)
- Geodynamica Diamond OA journal
  - Technical/copy editor (Shephard)

Other programs

- National Exploration Undercover School (NExUS 2025) (Leong)

Our group continues to drive high-impact geodynamics research while fostering a vibrant and collaborative community. Looking ahead, we are excited to build on this momentum with new research directions, funding opportunities, and community engagement efforts.

ACT school visit to ANU. Teaching about the timescale and geodynamics. Photo: Duvernay



Kick-off match for the Tangerine TRILOBITES 2025 season.



Research Activities

Geophysics (continued)

**Observational and Structural Seismology**

TBD

**Computational Geophysics and Algorithms**

TBD

# GEOCHEMICAL INSTRUMENT OPERATIONS

**Group leader** Brett Knowles

**Staff** Halimulati Ananuer, Hahjung Chin, Babs Fairchild, Bowen Fang, Michael Förster, Yoann Gréau, Heze Gong, Kathryn Hayward, Janet Hope, Laura Rodriguez Sanz, Yue Wang, Jiade Wu, Yang Wu, Sonja Zink

In 2025, the SHRIMP facility has successfully replaced and upgraded the SHRIMP II primary electronics. This upgrade significantly extends the operational lifespan of SHRIMP II and enhances the reliability of its electronics, paving the way for improving analytical precision and reproducibility in future work. We conducted 27 SHRIMP projects including 3 lab projects, 3 research projects and 21 service projects, collaborated with 37 researchers from 17 organizations, generating over \$180k revenue. We worked on developing 3 new analytical methods to support earth sciences research. From our research results, 5 articles in high profile journals including nature communications have been published. We also provided teaching and trainings to 2 undergraduate courses (EMSC3022/6022 and EMSC2024) and 12 PhD and honours students (8 from RSES and 4 from wider ANU), hosted 18 lab tours from academic institutions, government and media.

Include research highlights, lab developments, notable achievements, new directions, significant changes in focus, etc

2025 was also a busy year in the Marine Biogeochemistry group with a new MSc and PhD student starting with us. The coral tank is now thriving with several new corals collected as part of this PhD project. We hosted 3 visitors from the University of Tasmania working on Pore Water samples completing a large elemental survey of hundreds of samples using NoBias separation and ICPMS screening.

In late 2025 the CoSM specialist committee convened and each member of the team made applications to be converted to the specialist stream, with some also applying for reclassification of their roles to a higher level. We were very proud to have three successful applications to the scheme: Yue Wang (reclass. to ANU08), Yang Wu (ANU06/7), and Brett Knowles (reclass. to SM1). This is reflective of many years' hard work and dedication to their roles.

The Jaeger 7 ICP-MS Facility had a very productive 2025. Half of the lab management team (Brett Knowles) was off for 6-months' extended parental leave, and the lab was managed admirably in his absence by Yang Wu. New laser platforms Laser 1 & 2 were productive all year with the recently-commissioned Agilent ICP-MS and nu plasma II instruments. With the efforts of Yoann Greau Lu-Hf in zircons and Rb-Sr in apatites methods were re-established on the nu plasma III, and work was carried out on in-situ Rb-Sr and Lu-Hf dating by 'triple-quadrupole' ICP-MS. The lab saw over 260 instrument days used for the year resulting in \$165k revenue, and welcomed visitors from interstate (UTAS) and internationally (Chinese Academy of Sciences) to work on a range of projects. Finally, the lab had the pleasure to provide lab tours, talks, and instrument time to a range of undergraduate courses.

## Staff News

We farewelled Michael Förster in early November as he moved to Vienna with his partner. After many years working in the Jaeger 1 Stable Isotopes laboratory we also bid farewell to Laura Rodriguez Sanz in May 2025. Thanks to both for their dedicated service to the RSES.

# GEOPHYSICAL DATA AND COMPUTATION

**Group leader** Herb McQueen

**Staff** Kimberley Berends, Julian Byrne, Rajesh Erigela, Angus Gibson, Juan Carlos Graciosa, Laura Velasquez Jimenez, Venkata Sai Jaswanth Kota, Sima Mousavi, Dale Roberts, Santiago Velasquez, Ramkumar Voore

Geophysical Data and Computation staff support data collection, data management, processing, simulation, and analysis facilities in RSES.

As part of the field program, teams serviced the SNAKEY array of 20 broadband seismometers in South Australia and installed a seismometer in the 1km deep Stawell Underground Physics Laboratory in Victoria. The ARC Linkage SWAN experiment was wound up in Western Australia. In New Zealand, the Auckland-Hauraki Node Array experiment (AH-NA) experiment continued to operate around Auckland and the WETA experiment around Taupo and the FISSLE DAS experiment in Milford Sound were completed and removed.

The Australian National Seismic Imaging Resource (ANSIR) instrument pool supports a national seismic fieldwork capability. Using these instruments, collaboration continued with GSWA on WA Array (M8) telemetered stations and several ANSIR projects led by Geoscience Australia, GSWA and the University of Adelaide.

Fifteen Australian Seismometers in Schools (AuSIS) sites were visited during the year to service and update the instruments and engage with students and teachers. The program provides support for teaching and technical staff at the schools using the AuSIS equipment in class work. Data from the sites is transmitted to ANU and made publicly accessible on our Australian Passive Seismic Server (AusPASS) and other international datacentres.

In RSES, the ceres and terrawulf3 computational clusters operated successfully and the kaiju cluster has returned to full operation. Enhanced UPS support for critical components is being installed.

## Staff movements

- Santiago Velasquez joined the team during the year taking the lead in seismology fieldwork activities and instrument support.
- Rajesh Erigela left during the year. We thank him for his contributions to the operation of the Warramunga Station and the seismology field program.



ANSIR seismometer in the 1km deep Stawell Underground Physics Laboratory

# LABORATORY OPERATIONS

**Group leader**     Andrew Latimore

**Staff**             Electronics Group - Andrew Latimore, Peter Lanc, Yile Liu  
                         Mechanical Facility & Rock Physics High Pressure Lab - Hayden Miller  
                         Paleoenvironments - Pengxiang Hu  
                         Climate and Fluid Physics Laboratory - Angus Rummery  
                         Experimental Petrology - David Clark  
                         Radiocarbon Dating Laboratory - Rebecca Esmay  
                         Paleomagnetic Group - Yao Qian

tbd

# COLLECTIONS & CURATION

Following the departure of the Collection Officer in early 2025, oversight of the RSES collections has continued under the honorary academic supervision of Lynne Bean, ensuring continuity of stewardship and strategic development of the School's nationally significant holdings.

In 2025, progress was made toward integrating the RSES collections into EMu, the University's institutional collections management system. This migration represents a major step in aligning the School's collections with contemporary national standards for research infrastructure, governance, and digital accessibility. The transition requires comprehensive auditing and enhancement of legacy records to ensure accuracy, traceability, and long-term preservation of collection data.

The palaeontology collection has been prioritised for transfer to EMu, with completion scheduled before the end of 2026. This collection contains important type and reference specimens that underpin taxonomic research, stratigraphic correlation, and historical geological studies. Systematic verification of specimen records and storage locations has been undertaken to strengthen research reliability and compliance.

To support the verification of storage locations and to ensure the accurate relocation of all TYPE specimens within the palaeontology collection, RSES welcomed Dr Peter Jell, formerly of the Queensland Museum, for a three-week visit. His expertise proved invaluable, as the relocation and auditing of type material is a complex task best undertaken by two trained curators. Lynne acknowledges and greatly appreciates Dr Jell's contribution to this important phase of the project.

The ongoing digitisation and validation program significantly improves the discoverability, integrity, and research utility of the RSES collections. By strengthening documentation standards and integrating with institutional systems, the School is reinforcing the collections as enduring research assets that support Australian and international geoscience scholarship.

# RESEARCH GRANTS AWARDED DURING 2025

Project/Grant Title	Lead CI	Primary Funds Provider
GRACE Follow-On data analysis (\$50,000)	Paul Tregoning	Geoscience Australia

Research Grants

Project/Grant Title	Lead CI	Primary Funds Provider

# School Seminar Series

The Research School of Earth Sciences convened a dynamic fortnightly seminar program that brought together distinguished researchers from Australian and international universities, government agencies, and national research organisations. Presentations traversed the full spectrum of Earth sciences, from Antarctic processes and ocean dynamics to geodesy, deep Earth structure, environmental geochemistry, natural hazards, and advanced data science applications. Together, these seminars strengthened intellectual exchange within the School while reinforcing its engagement with globally significant scientific challenges.

Speaker and Institution	Seminar Title
Anna Wahlin (University of Gothenburg)	Swirls and scoops - Ice-base melt revealed by multibeam imagery of an Antarctic ice shelf
Leandro Diaz (University of Buenos Aires)	Observed precipitation trends in southern South America: drivers and uncertainties based on global climate models
Xin Wang (Chinese Academy of Sciences)	Seismic imaging of slab interfaces: insights into material and energy exchange in subduction zones
Zhen Wang (Monash University)	From Pollution to Prosperity: Geochemical Solutions for Tracing Environmental Legacy and Unlocking Economic Future of Energy and Mineral Wastes
Taimoor Sohail (University of Melbourne)	Data science and machine learning in oceanography
Paul Tregoning (ANU)	Geodesy for climate change: Observational evidence of ongoing changes on Earth
Brian Arbic (University of Michigan)	Long-term Earth-Moon evolution with high-level orbit and ocean tide models
Qingyu Wang (Université de Strasbourg)	Unveiling subsurface dynamics by listening to the Earth's hum
Fanny Garel (University of Montpellier)	Deep earthquakes & plate tectonics : 50 shades of lithosphere stiffness
Anya Reading (University of Tasmania)	Computational and Geophysical Adventures in East Antarctica
Nerilie Abram (ANU)	From emerging evidence of abrupt changes in the Antarctic environment to science-based approaches that can aid decision-makers in avoiding damaging climate change impacts
Katy Evans (Curtin University)	The first two years of the Murujuga Rock Art Monitoring Program: a summary
Ron Hackney (ANU)	A grand finale: IODP Expedition 405 tracking tsunamigenic slip across the Japan Trench

Speaker and Institution	Seminar Title
Rosa Didonna (CSIRO)	The Hidden Treasure of Earth: Formation and Exploration of Lithium Pegmatite in Australia
Sanaa Hobeichi (UNSW)	Enhancing drought prediction through Machine Learning and impacts reports
Mark Richards (UC Berkeley)	Chasing Darwin’s Shadow: Geophysics and Evolution in the Galápagos
Laura Otter (ANU)	Environmental Imprints on the Structure and Composition of Marine Biominerals
John Townend (Victoria University of Wellington)	Past, Present, and Future Earthquakes on the Alpine Fault: What Lies Beneath and What Lies Ahead?



TBD

# PEER REVIEWED PUBLICATIONS

Abram, NJ, Maher, N, Perkins-Kirkpatrick, S, Falster, GM, Hughes, TP, Meissner, KJ, Slater, LJ, King, AD, Pitman, AJ, Moon, G & Morgan, W 2025, 'Quantifying the regional to global climate impacts of individual fossil fuel projects to inform decision-making', *Npj Climate Action*, vol. 4, no. 1, 92. <https://doi.org/10.1038/s44168-025-00296-5>

Aguiar, Wilton & Morrison, Adele & Huneke, Wilma & Hutchinson, David & Spence, Paul & Hogg, Andrew & Colombo, Pedro & Stewart, Kial. (2025). 'Antarctic Dense Water Formation Sensitivity to Ocean Surface Cell Thickness.' *Journal of Advances in Modeling Earth Systems* <https://doi.org/17.10.1029/2024MS004913>.

Ajith, P, Seoane, PA, Sedda, MA, Arcodia, R, Badaracco, F, Banerjee, B, Belgacem, E, Benetti, G, Benetti, S, Bobrick, A, Bonforte, A, Bortolas, E, Braitto, V, Branchesi, M, Burrows, A, Cappellaro, E, Ceca, RD, Chakraborty, C, Subrahmanya, SC, Coughlin, MW, Covino, S, Derdzinski, A, Doshi, A, Falanga, M, Foffa, S, Franchini, A, Frigeri, A, Futaana, Y, Gerberding, O, Gill, K, Giovanni, MD, Giudice, IF, Giustini, M, Gläser, P, Harms, J, van Heijningen, J, Iacovelli, F, Kavanagh, BJ, Kawamura, T, Kenath, A, Keppler, EA, Kobayashi, C, Komatsu, G, Korol, V, Krishnendu, NV, Kumar, P, Longo, F, Maggiore, M, Mancarella, M, Maselli, A, Mastrobuono-Battisti, A, Mazzarini, F, Melandri, A, Melini, D, Menina, S, Miniutti, G, Mitra, D, Morán-Fraile, J, Mukherjee, S, Muttoni, N, Olivieri, M, Onori, F, Papa, MA, Patat, F, Perali, A, Piran, T, Piranomonte, S, Pol, AR, Pookkillath, MC, Prasad, R, Prasad, V, Rosa, AD, Chowdhury, SR, Serafinelli, R, Sesana, A, Severgnini, P, Stallone, A, Tissino, J, Tkalčić, H, Tomasella, L, Toscani, M, Vartanyan, D, Vignali, C, Zaccarelli, L, Zeoli, M & Zuccarello, L 2025, 'The Lunar Gravitational-wave Antenna: mission studies and science case', *Journal of Cosmology and Astroparticle Physics*, vol. 2025, no. 1, 108, pp. 1-167. <https://doi.org/10.1088/1475-7516/2025/01/108>

Allen, KJ, Gouramanis, C & Sauchyn, D 2025, 'Paleo-data is policy relevant: How do we better incorporate it in policy and decision making?', *Global and Planetary Change*, vol. 246, 104707. <https://doi.org/10.1016/j.gloplacha.2025.104707>

Alvarez Rodriguez, G., P. Tregoning, and R. McGirr 2025, 'A tool to assess the accuracy of Glacial Isostatic Adjustment predictions of present-day crustal uplift rates', *Geophysical Research Letters*, <https://doi.org/10.1029/2025GL116421>

Amaya, DJ, Maher, N, Deser, C, Jacox, MG, Alexander, MA, Newman, M, Dias, J & Lou, J 2025, 'Linking Projected Changes in Seasonal Climate Predictability and ENSO Amplitude', *Journal of Climate*, vol. 38, no. 3, pp. 675-688. <https://doi.org/10.1175/JCLI-D-23-0648.1>

Amelin, Y, Yin, QZ, Koefoed, P, Merle, R, Hibiya, Y, Huyskens, MH, Iizuka, T & Cartwright, JA 2025, 'Fractionation of radiogenic Pb isotopes in meteorites and their components induced by acid leaching', *Geochimica et Cosmochimica Acta*, vol. 392, pp. 52-69. <https://doi.org/10.1016/j.gca.2024.11.008>

Anenburg, M, Chen, J, Gardiner, MG, de Hoog, JCM, Humphreys, MCS, Missen, OP, Mills, SJ & Pašić, B 2025, 'Silica substituted carbonate apatite: synthesis and analytical challenges', *Journal of Materials Chemistry B*, vol. 32, pp. 9968-9981. <https://doi.org/10.1039/d5tb01061f>

Armistead, SE, Eglinton, BM, Pehrsson, SJ & Huston, DL 2025, 'Archean geodynamics and plate tectonics linked to Pb isotope variability', *Geology*, vol. 53, no. 11, pp. 961-965. <https://doi.org/10.1130/G53553.1>

- Auger, Matthis & Spence, Paul & Morrison, Adele & Garabato, Alberto & Silvano, Alessandro. (2025). 'The variability of Antarctic dense water overflows can be observed from space.' *Communications Earth & Environment*. 6. <https://doi.org/10.1038/s43247-025-02210-7>
- Bahlburg, H, Kemp, AIS, Fanning, CM & Martin, L 2025, 'The Hf and O isotope record of long-lasting accretionary orogens: The example of the Proterozoic and Paleozoic-Triassic central South America', *Earth-Science Reviews*, vol. 262, 105068. <https://doi.org/10.1016/j.earscirev.2025.105068>
- Baker, EB, Muxworthy, AR & Heslop, D 2025, 'Testing the directional recording ability of natural chemical remanent magnetisations using historical sediments', *Earth and Planetary Science Letters*, vol. 672, 119718. <https://doi.org/10.1016/j.epsl.2025.119718>
- Barnes, Ashley & Shakespeare, Callum & Hogg, Andrew & Constantinou, Navid. (2025). 'Rapid Topographic Scatter of Near-Inertial Waves Generated by Storms.' *Journal of Physical Oceanography*. 55. 1847-1858. <https://doi.org/10.1175/JPO-D-24-0240.1>.
- Bean LB, 'Cacatualepis: a new genus name for coccolepids from the Australian Mesozoic', *Alcheringa: An Australasian Journal of Palaeontology*, 13 May 2025. <https://doi.org/10.1080/03115518.2025.2488057>
- Berry, AJ, Faul, UH, Yang, Q, Kokkonen, H, Kingston, AM, Limaye, A & de Jonge, MD 2025, 'Wetted two-grain boundaries in olivine aggregates and seismic velocities in the oceanic upper mantle', *Earth and Planetary Science Letters*, vol. 651, 119119. <https://doi.org/10.1016/j.epsl.2024.119119>
- Bhagtani, D, McC. Hogg, A, Holmes, RM, Constantinou, NC & Khatri, H 2025, 'Asymmetric Response of the North Atlantic Gyres to the North Atlantic Oscillation', *Journal of Geophysical Research: Oceans*, vol. 130, no. 6, e2024JC021997. <https://doi.org/10.1029/2024JC021997>
- Bilton, L, Duvernay, T, Davies, DR & Eakin, CM 2025, 'PyDRex: predicting crystallographic preferred orientation in peridotites under steady-state and time-dependent strain', *Geophysical Journal International*, vol. 241, no. 1, pp. 35-57. <https://doi.org/10.1093/gji/ggaf026>
- Blanks, DE, Holwell, DA, Ezad, IS, Giuliani, A, L. Fiorentini, M & Foley, SF 2025, 'The mineralogical distribution of Ni in mantle rocks controls the fertility of magmatic Ni-sulfide systems', *Mineralium Deposita*, vol. 60, pp. 1325-1337. <https://doi.org/10.1007/s00126-025-01349-9>
- Boeira Dias, F., England, M. H., Morrison, A. K., and Galton-Fenzi, B. K. (2025) 'Seasonal variability of ocean heat transport and ice-shelf basal melt around Antarctica', *The Cryosphere*, 19, 5231–5258, <https://doi.org/10.5194/tc-19-5231-2025>
- Boswijk, G, Schwendenmann, L, Grierson, P, Hogg, A, Allen, K, Brookhouse, M, Brooks-English, N, Yukich Clendon, O, Cordwell, J, Ford, A, Gale, A, Haines, H, Johns, D, Kasel, S, Loader, N, Lusk, C, Medd, O, Newsham, S, Paterson, M, Ryan, C, Sharp, E, Verdon-Kidd, D & Wardlaw, T 2025, 'Looking at the Wood, Seeing the Trees and More: Australia-New Zealand Tree-Ring Science Conference, January 2025' *Tree-Ring Research*, vol. 81, no. 2, pp. 96-101. <https://doi.org/10.3959/TRR2025-5>
- Brown, H., Vilacís, B., Stotz, I. L., & Bunge, H. P. (2026). Synthetic geological hiatus maps as a tool for assessing reconstructions of past dynamic topography. *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 482(2330). <https://doi.org/10.1098/rspa.2025.0249>

- Callaway, M., Taib, M., Tregoning, P., Gouramanis, C., & Dodd, L. (2025), SWOT reveals flood depths and environmental flows in wetlands, *Nature Communications Earth and Environment*, under review 29 October, 2025.
- Chambers, C., Huang, Y. & Roberts, D. (2025) The impact of sea surface temperatures over the Coral Sea on the warm core intensification of a Tasman Sea cyclone. *Quarterly Journal of the Royal Meteorological Society*, e70085. <https://doi.org/10.1002/qj.70085>
- Chen, C, Förster, MW, Shcheka, SS, Ezad, IS, Shea, JJ, Liu, Y, Jacob, DE & Foley, SF 2025, 'Sulfide-rich continental roots at cratonic margins formed by carbonated melts', *Nature*, vol. 637, no. 8046, pp. 615-621. <https://doi.org/10.1038/s41586-024-08316-w>
- Cheng, M, Maher, N & Ellwood, MJ 2025, 'Evaluating the performance of CMIP6 models in simulating Southern Ocean biogeochemistry', *Biogeosciences*, vol. 22, no. 22, pp. 7269-7291. <https://doi.org/10.5194/bg-22-7269-2025>
- Coward, AJ, Brugger, J, Wilson, S, Slim, AC, Williams, T, Pillans, B & Maksimenko, A 2025, 'Mineralogy and geochemistry of pattern formation in print stone from the Pilbara, Australia', *Mineralogical Magazine*, vol. 89, no. 5. <https://doi.org/10.1180/mgm.2025.11>
- Dai, Y & Yu, J 2025, 'Contributions of biological and physical dynamics to deglacial CO2 release from the polar Southern Ocean', *Nature Communications*, vol. 16, 2665. <https://doi.org/10.1038/s41467-025-57677-x>
- Dai, Y, Pickering, R, Cassarino, L, Han, S & Conley, DJ 2025, 'Variable Silicon Isotope Fractionation Between Authigenic Phases and Pore Fluids in Marine Sediments', *Geophysical Research Letters*, vol. 52, no. 12, e2025GL116217. <https://doi.org/10.1029/2025GL116217>
- Dao, T.L., Vincent, C.L., Huang, Y., Peatman, S.C., Soderholm, J.S., Birch, C.E. & Roberts, D. (2025) Joint modulation of coastal rainfall in Northeast Australia by local and large-scale forcings. *Quarterly Journal of the Royal Meteorological Society*, 152(774), e70027. <https://doi.org/10.1002/qj.70027>
- Dawson, Hannah & England, Matthew & Morrison, Adele & Dias, Fabio. (2025). 'End-of-21st century changes on the Antarctic continental shelf under mid- and high-range emissions scenarios.' *Journal of Climate*. 38. <https://doi.org/10.1175/JCLI-D-24-0189.1>
- De Deckker, P. 2025. Is the distribution of planktonic foraminifera guided by sea-water density? *Palaeoworld* doi.org/10.1016/j.palwor.2025.201034.
- Dong, B, Hausmann, N, Otter, LM, Drysdale, RN & Prendergast, AL 2025, 'Visualising and quantifying Mg/Ca and Sr/Ca heterogeneity in the isochronous growth increments of bivalve shells (*Tridacna*)', *Chemical Geology*, vol. 696, 123109. <https://doi.org/10.1016/j.chemgeo.2025.123109>
- Dujardin, AD, Demouchy, S, Alard, O, Gardés, E, Laubier, M & Barou, F 2025, 'Ultra-Mafic Cumulates From Kaupulehu, Hualālai Volcano, Hawai'i: Geochemical Resetting of Mantle-Inherited Olivine', *Geochemistry, Geophysics, Geosystems*, vol. 26, no. 7, e2024GC012128, pp. 1-24. <https://doi.org/10.1029/2024GC012128>
- Ellison, E, Shakespeare, C & Kiss, AE 2025, 'A Mesoscale Resolving Model Reveals Pathways of Nutrient Transport Across Southern Ocean Fronts', *Journal of Geophysical Research: Oceans*, vol. 130, no. 11, e2025JC022698. <https://doi.org/10.1029/2025JC022698>

- England, MH, Li, Z, Huguenin, MF, Kiss, AE, Sen Gupta, A, Holmes, RM & Rahmstorf, S 2025, 'Drivers of the extreme North Atlantic marine heatwave during 2023', *Nature*, vol. 642, pp. 1-22. <https://doi.org/10.1038/s41586-025-08903-5>
- Fan, ZW, Li, B, Shao, YJ, Brzozowski, MJ, Mavrogenes, JA, Xiong, YQ, Su, JH & Liu, QQ 2025, 'Continental melting and growth through subduction processes: Evidence from the petrogenesis of Paleozoic granitoids and gabbros in the Qinling Orogen', *Lithos*, vol. 504-505, 108054. <https://doi.org/10.1016/j.lithos.2025.108054>
- Fichtner, A, Hofstede, C, Kennett, BLN, Svensson, A, Westhoff, J, Walter, F, Ampuero, JP, Cook, E, Zigone, D, Jansen, D & Eisen, O 2025, 'Hidden cascades of seismic ice stream deformation', *Science (New York, N.Y.)*, vol. 387, no. 6736, pp. 858-864. <https://doi.org/10.1126/science.adp8094>
- Fierro-Arcos, D, Corney, S, Meyer, A, Hayashida, H, Kiss, AE, Emmerson, L, Southwell, C & Heil, P 2025, 'High-resolution ocean sea ice model outputs to predict species distribution: case study of crabeater seal *Lobodon carcinophagus* in East Antarctica', *Marine Ecology Progress Series*, vol. 772, pp. 193-214. <https://doi.org/10.3354/meps14968>
- Foley, SF, Ezad, IS, Shu, C & Förster, MW 2025, 'Melting of amphibole-apatite-rich metasomes in the continental mantle and comparison of melt compositions with natural igneous rocks', *Lithos*, vol. 500-501, 107976, pp. 1-22. <https://doi.org/10.1016/j.lithos.2025.107976>
- Förster, MW, Otter, LM, Brocks, JJ, Jayasoma, K, Cisneros-Lazaro, D, Nowak, D, Stolarski, J & Knowles, B 2025, 'Quality Control Measures for Enhancing Confidence in Nanoscale IR Spectroscopy', *Geostandards and Geoanalytical Research*, vol. 49, no. 4. <https://doi.org/10.1111/ggr.70014>
- Fox, JM, Watson, SJ, Falloon, TJ, Carey, RJ, Whittaker, JM, Spain, EA, Duncan, RA, Arculus, RJ & Coffin, MF 2025, 'Offshore evidence for volcanic landslide post Last Glacial Maximum at sub-Antarctic Heard Island, southern Indian Ocean', *Volcanica*, vol. 8, no. 1, pp. 31-50. <https://doi.org/10.30909/vol.08.01.3150>
- Franco-Santos, RM, Eggins, S, Ellwood, MJ, Hoem, N, Nichols, PD, Virtue, P & Maher, WA 2025, 'Mercury concentration in Antarctic krill varies in time and space and with individual size', *Environmental Chemistry*, vol. 22, no. 4, EN24103. <https://doi.org/10.1071/EN24103>
- Gauntlett, M., Eakin, C.M., Bishoyi, N., O'Donnell, J.P., Murdie, R., Miller, M.S., Pickle, R., Ebrahimi, R. (2025) Seismic anisotropy analysis across Southwestern Australia reveals ENE-trending lithospheric architecture linked to Archean Yilgarn Craton formation, *Geochemistry, Geophysics, Geosystems*, 26, e2025GC012589. <https://doi.org/10.1029/2025GC012589>
- Ghelichkhan, S., M.J. Hoggard, F.D., Richards, N.-H. Chan, J.R. Creveling, K.M. Moore, & J.X. Mitrovica (2025). Closing the budget of 20<sup>th</sup> century true polar wander, *Geophysical Journal International*, 242, 1-6. <https://doi.org/10.1093/gji/ggaf197>
- Gibson, G. M., Cloutier, J, & Huston, D. L. (2025): Timing and tectonic setting of sediment-hosted Pb-Zn mineralization in Palaeoproterozoic northern Australia: a review and comparison with Mississippi Valley- and Irish-type deposits. *Journal of the Geological Society* 182 (4): 19pp. <https://doi.org/10.1144/jgs2024-160>.
- Gibson, GM, Champion, DC & Doublier, MP 2025, 'The Paleoproterozoic Trans-Australian Orogen: Its magmatic and tectonothermal record, links to northern Laurentia, and implications for supercontinent assembly', *Bulletin of the Geological Society of America*, vol. 137, no. 1-2, pp. 495-521. <https://doi.org/10.1130/B36255.1>

- Goddard, BK, Otter, LM, Hughes, JM, Jaine, FRA, Martino, JC, Troitzsch, U, Doherty, J & Schilling, HT 2025, 'Structure and composition of yellowtail kingfish (*Seriola lalandi*) otoliths: implications for using aquaculture-reared fish to reconstruct life histories', *Journal of Fish Biology*, vol. 107, no. 4, pp. 1188-1200. <https://doi.org/10.1111/jfb.70110>
- Gouramanis, C, Chua, S, Etchebes, M, Klinger, Y, Xu, X, Mingxing, G, Switzer, AD, Hancock, G & Tapponnier, P 2025, 'Episodic rainfall events characterise complex sediment deposition in a fault-bounded sag pond in Northwest China', *Geomorphology*, vol. 470, 109538. <https://doi.org/10.1016/j.geomorph.2024.109538>
- Gouramanis, C, Srinivasalu, S, Karthik, A, Pham, DT, Carson, S & Switzer, AD 2025, 'Rapid, complex back barrier pedestal formation preconditions washover deposition on the southeast Indian coast', *Marine Geology*, vol. 481, 107477. <https://doi.org/10.1016/j.margeo.2025.107477>
- Green, DR, Smith, TM, Olack, G, Williams, IS, Tafforeau, P, Colman, AS & Uno, KT 2025, 'How teeth record and attenuate seasonal signals', *Journal of Archaeological Science*, vol. 175, 106148. <https://doi.org/10.1016/j.jas.2024.106148>
- Hassler, CS, Simó, R, Fawcett, SE, Ellwood, MJ & Jaccard, SL 2025, 'Marine biogenic humic substances control iron biogeochemistry across the Southern Ocean', *Nature Communications*, vol. 16, no. 1, 2662. <https://doi.org/10.1038/s41467-025-57491-5>
- Heron, PJ, Dannberg, J, Gassmöller, R, Shephard, GE, van Hunen, J & Pysklywec, RN 2025, 'The impact of Pangean subducted oceans on mantle dynamics: Passive piles and the positioning of deep mantle plumes', *Gondwana Research*, vol. 138, pp. 168-185. <https://doi.org/10.1016/j.gr.2024.10.007>
- Heslop, D & Roberts, AP 2025, 'Establishing a Statistical Framework for Assessing Paleomagnetic Data Quality: A Significance Test Based on Maximum Angular Deviation', *Journal of Geophysical Research: Solid Earth*, vol. 130, no. 6, e2025JB031417, pp. 1-12. <https://doi.org/10.1029/2025JB031417>
- Holgate, CM, Falster, GM, Gillett, ZE, Goswami, P, Grant, MO, Hobeichi, S, Hoffmann, D, Jiang, X, Jin, C, Lu, X, Mu, M, Page, JC, Parker, TJ, Vogel, E, Abram, NJ, Evans, JP, Gallant, AJE, Henley, BJ, Kala, J, King, AD, Maher, N, Nguyen, H, Pitman, AJ, Power, SB, Rauniyar, SP, Taschetto, AS & Ukkola, AM 2025, 'Physical mechanisms of meteorological drought development, intensification and termination: an Australian review', *Communications Earth and Environment*, vol. 6, no. 1, 220. <https://doi.org/10.1038/s43247-025-02179-3>
- Huang, Y, Ide, S, Kato, A, Yoshida, K, Jiang, C & Zhai, P 2025, 'Fault material heterogeneity controls deep interplate earthquakes', *Science advances*, vol. 11, no. 9, eadr9353. <https://doi.org/10.1126/sciadv.adr9353>
- Huang, Y., Lane, T.P., Ayat, H., Su C. H., Wales, S., Roberts, D, et al. (2025) AUS2200: A High-Resolution Limited-Area Modelling Project for Australia. Submitted to *Journal of Southern Hemisphere Earth Systems Science*. <https://doi.org/10.22541/essoar.176452829.97733554/v1>
- Huang, AT, Maher, N & McGregor, S 2025, 'ENSO's Impacts on Southeastern Australia's Future Rainfall Risk', *Geophysical Research Letters*, vol. 52, no. 24, e2025GL118673. <https://doi.org/10.1029/2025GL118673>
- Huneke, WGC, Hogg, AMC, Dix, M, Bi, D, Sullivan, A, McGregor, S, Holgate, CM, O'Farrell, SP & Oliveira, MJT 2025, 'The ACCESS-CM2 climate model with a higher resolution ocean-sea ice component (1/4°)', *Geoscientific Model Development*, vol. 18, no. 24, pp. 9991-10015. <https://doi.org/10.5194/gmd-18-9991-2025>

Jakobsson, M., Dowdeswell, J., Kirchner, N., Noormets, R., Shephard, G.E.. 2025. Oceanography, marine geology, cryosphere and climate of Svalbard. *Naturae Observatio SPITSBERGEN* (Ed. Hansen, L.) ( ISBN: 978-1-904145-36-3 (printed book) | ISSN 2397-7302 (iBOOK, digital version).

Jiang, S, Duvernay, T, Hoggard, MJ, Hawkins, R, Campbell, IH & Davies, DR 2025, 'Investigating the Lid Effect on the Generation of Ocean Island Basalts: 2. Geodynamical Simulations', *Geochemistry Geophysics Geosystems*, vol. 26, no. 4, e2024GC012123. <https://doi.org/10.1029/2024GC012123>

Jou, RM, Macario, KD, Pessenda, LC, Gomes, FB, Oliveira, FM, Pedrosa, R, Alves, EQ, Fallon, S, Santos, LJC, Maniesi, V & Bastos, AS 2025, 'Methodological tests using Amazonian soil samples for 14C-AMS dating', *Radiocarbon*. <https://doi.org/10.1017/RDC.2024.102>

Kalmár, D, Petrescu, L, Hetényi, G, Michailos, K, Süle, B, Neagoe, C, Bokelmann Götzt, TA & Groups, PACASEW 2025, 'Mantle transition zone analysis using P-to-S receiver functions in the Alpine–Carpathian–Dinarides region: impact of plumes and slabs', *Geophysical Journal International*, vol. 243, no. 1, pp. ggaf313. <https://doi.org/10.1093/gji/ggaf313>

Kennett, BLN & Saygin, E 2025, 'The Effect of Sharp Bends and Cable Coupling on DAS Recording in an Urban Environment', *Seismic Record*, vol. 5, no. 1, pp. 118-126. <https://doi.org/10.1785/0320240045>

Khan, M, Li, H, Algeo, TJ, Khan, A, Förster, MW & Ullah, Z 2025, 'Geochemistry and Geochronology of A-Type Intermediate-Felsic Rocks in NW Himalaya, Pakistan: Implications for Petrogenesis and Tectonic Evolution of Northern Gondwana', *Geochemistry, Geophysics, Geosystems*, vol. 26, no. 1, e2024GC011802. <https://doi.org/10.1029/2024GC011802>

King, AD, Alastrué de Asenjo, E, Maycock, AC, Ziehn, T, Borowiak, AR, Clark, S & Maher, N 2025, 'Detectability of Post-Net Zero Climate Changes and the Effects of Delay in Emissions Cessation', *Earth's Future*, vol. 13, no. 12, e2025EF006918. <https://doi.org/10.1029/2025EF006918>

Koch, MC, Chand, B, Mukherjee, M & Dey, A 2025, 'Generation of negative skin friction and drag load in near-offshore pile foundations: A numerical study addressing pile installation effects', *Ocean Engineering*, vol. 340, no. Part 1, 122219. <https://doi.org/10.1016/j.oceaneng.2025.122219>

Kourim, F, Bodinier, JL, ALARD, O, Wang, KL, Michibayashi, K, Bendaoud, A, Vauchez, A & Dautria, J-M 2025, Nature and Evolution of the Lithospheric Mantle Beneath the Hoggar Swell (Algeria): Deformation, Melt-Rock Interactions and Olivine Seismic Properties Recorded by Mantle Xenoliths. in M Hamoudi, A Bendaoud, J-L Bodinier, K Ouzegane & H Perfettini (eds), *Lithospheric Architecture and Precambrian Geology of the Hoggar and Adjacent Areas: A Reference Case for Mapping and Modeling in Geosciences*. Regional Geology Reviews, Springer, Switzerland, pp. 149-177. <[https://doi.org/10.1007/978-3-319-70250-6\\_9](https://doi.org/10.1007/978-3-319-70250-6_9)>

Lawley, CJM, Petts, DC, Lee, WS, Cajal, Y, Carrasco-Godoy, C, Campbell, IH, Dlugosz, J, Larson, KP, Savard, D, Kjarsgaard, I & van Straaten, BI 2025, 'Critical raw material potential of porphyry copper-gold deposits in the Golden Triangle, northwest British Columbia, Canada', *Ore Geology Reviews*, vol. 178, 106463. <https://doi.org/10.1016/j.oregeorev.2025.106463>

Leung, J., Walker, A.M., Koelmeijer, P., Restelli, F. and Davies, D.R., 2025. Quantitative assessment of tomographic proxies for lowermost mantle composition and mineralogy. *Physics of the Earth and Planetary Interiors*, p.107423.

Lewis, H, Grant, MI, ALARD, O, Kyne, PM, Hui-Qing, H, Gréau, Y, Harry, AV, Johnson, GJ, Kirk, A & Mahan, B 2025, 'Challenging traditional methods of age estimation: elemental and isotopic characterisation of speartooth shark *Glyphis glyphis vertebrae*', *Marine Ecology Progress Series*, vol. 771, pp. 105-121. <https://doi.org/10.3354/meps14986>

Li, H, Insua-Costa, D, Koppa, A, Geirinhas, JL, Keune, J, Holgate, CM, Dominguez, F, Deman, VMH, Teuling, AJ & Miralles, DG 2025, 'Observational evidence of compensatory influences of deforestation on downwind precipitation in Brazilian breadbaskets', *npj Climate and Atmospheric Science*, vol. 8, no. 1, 279, pp. 1-10. <https://doi.org/10.1038/s41612-025-01152-3>

Liu, Z, Algeo, TJ, Brocks, JJ, van Maldegem, LM, Gilleaudeau, GJ, Kah, LC, Cheng, M & Yu, W 2025, 'Salinity reconstruction in Proterozoic depositional systems', *Bulletin of the Geological Society of America*, vol. 137, no. 1-2, pp. 447-464. <https://doi.org/10.1130/B37489.1>

Liu, Y & Anenburg, M 2025, 'Reaction-driven magmatic crystallisation at the Maoniuping carbonatite', *Nature Communications*, vol. 16, no. 1, 7159, pp. 1-12. <https://doi.org/10.1038/s41467-025-62009-0>

Magrini, F., He, J. and Sambridge, M., (2025). 'BayesBay: A Versatile Bayesian Inversion Framework Written in Python.' *Seismological Research Letters*; 96 (3): 2052–2064. <https://doi.org/10.1785/0220240275>

Maher, N, Phillips, AS, Deser, C, Jnglin Wills, RC, Lehner, F, Fasullo, J, Caron, JM, Brunner, L, Beyerle, U & Jeffree, J 2025, 'The updated Multi-Model Large Ensemble Archive and the Climate Variability Diagnostics Package: new tools for the study of climate variability and change', *Geoscientific Model Development*, vol. 18, no. 18, pp. 6341-6365. <https://doi.org/10.5194/gmd-18-6341-2025>

Maibam, B, Nongdon, W, Kumar, P, Gréau, Y, Berndt, J, Foley, S, Singh, AK & Khandelwal, D 2025, 'Paleoproterozoic to Cambro-Ordovician crustal evolution in the northern Indian margin: Evidence from whole-rock geochemical, zircon U–Pb, Hf and O isotope signatures in the granitoids of Arunachal Himalaya, Northeast India', *Gondwana Research*, vol. 146, pp. 107-129. <https://doi.org/10.1016/j.gr.2025.05.022>

Makushkina, A, Tauzin, B, Miller, MS, Tkalčić, H & Thybo, H 2025, 'Opening of the North Atlantic Ocean and the rise of Scandinavian mountains', *Geology*, vol. 53, no. 1, pp. 8-12. <https://doi.org/10.1130/G52735.1>

Malan, N, Gupta, AS, Schaeffer, A, Zhang, S, Doblin, MA, Pilo, GS, Kiss, AE, Everett, JD, Behrens, E, Capotondi, A, Cravatte, S, Hobday, AJ, Holbrook, NJ, Kajtar, JB & Spillman, CM 2025, 'Lifting the lid on Marine Heatwaves', *Progress in Oceanography*, vol. 239, 103539. <https://doi.org/10.1016/j.pocean.2025.103539>

Marignier, A, Eakin, CM & Miller, MS 2025, 'Sediment Thickness of the Contiguous United States from Teleseismic Receiver Functions', *Seismological Research Letters*, vol. 96, no. 6, pp. 3656-3664. <https://doi.org/10.1785/0220250077>

Matthews, T, Ramsay, EE, Saeed, F, Sherwood, S, Jay, O, Raymond, C, Abram, N, Lee, JKW, Barley, S, Perkins-Kirkpatrick, S, Khan, MS, Meissner, KJ, Roberts, C, Mavalankar, D, Smith, KGC, Ullah, A, Sadad, A, Turner, V & Forrest, A 2025, 'Humid heat exceeds human tolerance limits and causes mass mortality', *Nature Climate Change*, vol. 15, no. 1, pp. 4-6. <https://doi.org/10.1038/s41558-024-02215-8>

Maubant, L, Dodd, L & Tregoning, P 2025, 'Assessing the Accuracy of SWOT Measurements of Water Bodies in Australia', *Geophysical Research Letters*, vol. 52, no. 6, e2024GL114084. <https://doi.org/10.1029/2024GL114084>

McKibbin, SJ, Ávila, JN, Ireland, TR, Van Ginneken, M, Soens, B, Van Maldeghem, F, Huber, M, Baeza, L, Patkar, A, Vanhaecke, F, Debaille, V, Claeys, P & Goderis, S 2025, 'Triple-oxygen isotopes of stony micrometeorites by secondary ion mass spectrometry (SIMS): Olivine, basaltic glass and iron oxide matrix effects for sensitive high-mass resolution ion microprobe-stable isotope (SHRIMP-SI)', *Rapid Communications in Mass Spectrometry*, vol. 39, no. 1, e9921. <https://doi.org/10.1002/rcm.9921>

Meza-Cala, JC, Faleide, JI, Minakov, A, Abdelmalak, MM, Shephard, GE, Geissler, WH, Klitzke, P, Mattingsdal, R & Gaina, C 2025, 'Crustal structure of the North Svalbard margin: Continental breakup and Eurasia Basin opening', *Tectonophysics*, vol. 912, 230861. <https://doi.org/10.1016/j.tecto.2025.230861>

Michailos, K, Chamberlain, CJ, Simpson, G, Cox, SC, Townend, J, Vargo, LJ, Oestreicher, N & Miller, MS 2025, 'Temporal Evolution of Seismicity in the Central Southern Alps, New Zealand: Evidence for Rainfall-Triggered Seismicity', *Geochemistry, Geophysics, Geosystems*, vol. 26, no. 8, e2025GC012317. <https://doi.org/10.1029/2025GC012317>

Miller, MS, Townend, J & Lai, VH 2025, 'The South Island Seismology at the Speed of Light Experiment (SISSLE): Distributed Acoustic Sensing Across and Along the Alpine Fault, South Westland, New Zealand', *Seismological Research Letters*, vol. 96, no. 3, pp. 2065-2078. <https://doi.org/10.1785/0220240322>

Misztela, MA, Rampino, MR & Campbell, IH 2025, 'Platinum-group elements (PGEs) and rhenium in Permian-Triassic boundary sediments from southern China and Japan linked to concurrent eruptions of the Siberian Traps', *Chemical Geology*, vol. 681, 122715. <https://doi.org/10.1016/j.chemgeo.2025.122715>

Nixon, AL, Boone, SC, Gréau, Y, Kohlmann, F, Theile, M, Noble, W, Prent, A, Foden, J, Barnes, S, Wainwright, AN, Wade, B, Goemann, K, Gilbert, S, Evans, NJ, Dalton, H, Ware, B & McInnes, BIA 2025, 'Volcanoes to vugs: Demonstrating a FAIR geochemistry framework with a diverse application of major and trace element data through the AuScope EarthBank platform', *Chemical Geology*, vol. 696, 123092. <https://doi.org/10.1016/j.chemgeo.2025.123092>

Nongdon, W, Maibam, B, Kumar, P, Greau, Y, Berndt, J, Foley, S, Singh, AK & Khandelwal, D 2025, 'Pre-Himalayan crustal evolution in the northern margin of India: Implications from zircon U-Pb, Hf and O isotope study of Chhota Shigri granitoids, Himachal Himalaya, Northwest India', *Gondwana Research*, vol. 141, pp. 55-73. <https://doi.org/10.1016/j.gr.2025.02.001>

O'Donnell, JP, Selway, K, Wade, C, Thiel, S, Eakin, C, Pickle, R, Agrawal, S, Goleby, B & Gorbatov, A 2025, 'The Deep Lithospheric Structure of the South Australian Craton Revealed by Teleseismic Rayleigh Wave Tomography', *Seismica*, vol. 4, no. 2. <https://doi.org/10.26443/seismica.v4i2.1772>

Ógúnsàmi, AR, Jackson, I, Pimienta, L & Fortin, J 2025, 'Squirt flow in a tight sandstone: an interlaboratory study', *Geophysical Journal International*, vol. 240, no. 3, pp. 1387-1403. <https://doi.org/10.1093/gji/ggae451>

Ouyang, L, Huang, W, Wu, J, Mavrogenes, J, Liao, J, Zhang, J, Liang, H, Yan, S & Xia, X 2025, 'Cassiterite features and lifespan of Limu granite Ta-Nb-Sn-W ore-forming system in Guangxi, South China', *Journal of Geochemical Exploration*, vol. 273, 107696. <https://doi.org/10.1016/j.gexplo.2025.107696>

Parazin, B, N. Gomez, F.D. Richards, M.J. Hoggard, S. Coulson, & J.X. Mitrovica (2025). Ice sheets without dynamic topography, *Geophysical Research Letters*, 52, e2025GL115332. <https://doi.org/10.1029/2025GL115332>

Peel, CJ, Howarth, GH, Costin, G, Alard, O & Foley, S 2025, 'Open- versus closed-system magmatism on Mars revealed by shergottites', *Communications Earth and Environment*, vol. 6, no. 1, 1059. <https://doi.org/10.1038/s43247-025-03026-1>

Peng, JP, Jones, NL, Rayson, MD, Schmitt, M, Umlauf, L, Whitwell, C, Keating, SR, Shakespeare, CJ & Ivey, GN 2025, 'Interactions Between Diurnal Warm Layers and Surface-Layer Fronts', *Journal of Geophysical Research: Oceans*, vol. 130, no. 1, e2024JC021380. <https://doi.org/10.1029/2024JC021380>

Phạm T.-S., H. Tkalčić, J. Hu, Z. Wei, On the global centroid moment tensor achievements and the next generation earthquake catalogs, *Physics of the Earth and Planetary Interiors* (invited review), 370, doi:10.1016/j.pepi.2025.107490, 2026.

Phạm, TS 2025, 'Systematic Detection of Glacial Earthquakes in Thwaites Glacier, West Antarctica, by Regional Surface Waves', *Geophysical Research Letters*, vol. 52, no. 24, e2025GL118885. <https://doi.org/10.1029/2025GL118885>

Phạm T.-S., Hundreds of iceberg earthquakes detected at the crumbling end of Antarctica's Doomsday Glacier, doi:10.64628/AA.gp63hy4qr *The Conversation*, 2025.

Puchtel, IS, Walker, RJ, Aulbach, S and Bennett, VC, 2025, 'Osmium and tungsten isotopes reveal Earth's youthful exuberance' *Elements* 21 (4), 277-282. <https://doi.org/10.2138/gselements.21.4.277>

Pilia, S., Iaffaldano, G., Davies, D.R., Ismaiel, M., Sossi, P.A., Whattam, S., Zhao, D. and Hu, H., 2025. Ghost plumes hidden beneath Earth's continents. *Earth and Planetary Science Letters*, 666, p.119467.

P. P. Maharaj, P, Barrett, PM & Ellwood, MJ 2025, 'Biogeochemical cycling of dissolved Cu along the East Australian Current', *Marine Chemistry*, vol. 268, 104481. <https://doi.org/10.1016/j.marchem.2024.104481>,

<https://doi.org/10.1016/j.marchem.2024.104481> Ray, S, Yaxley, GM, Miller, LA & Berry, AJ 2025, 'Monazite saturation in carbonatite melts at crustal and upper mantle conditions', *Geochimica et Cosmochimica Acta*, vol. 393, pp. 1-17. <https://doi.org/10.1016/j.gca.2025.01.039>

Rehn, E, Cadd, H, Mooney, S, Cohen, TJ, Munack, H, Codilean, AT, Adeleye, M, Beck, KK, Constantine, M, Gouramanis, C, Hanson, JM, Jones, PJ, Kershaw, AP, Mackenzie, L, Maisie, M, Mariani, M, Matley, K, McWethy, D, Mills, K, Moss, P, Patton, NR, Rowe, C, Stevenson, J, Tibby, J & Wilmshurst, J 2025, 'The SahulCHAR collection: a palaeofire database for Australia, New Guinea, and New Zealand', *Earth System Science Data*, vol. 17, no. 6, pp. 2681-2692. <https://doi.org/10.5194/essd-17-2681-2025>

Reid, KJ, Barnes, MA, Gillett, ZE, Parker, T, Udy, DG, Ayat, H, Boschhat, G, Bowden, A, Grosfeld, NH, King, AD, Richardson, D, Shao, Y, Teckentrup, L, Trewin, B, Hope, P, Zhou, L, Borowiak, AR, Holgate, CM & Isphording, RN 2025, 'A Multiscale Evaluation of the Wet 2022 in Eastern Australia', *Journal of Climate*, vol. 38, no. 4, pp. 909-929. <https://doi.org/10.1175/JCLI-D-24-0224.1>

Ribeiro, N., Morrison, A. K., Rintoul, S. R., Bindoff, N. L., Herraiz-Borreguero, L., & Williams, G. (2025). 'Wind-driven variability of modified Circumpolar Deep Water intrusions into Vincennes Bay, East Antarctica.' *Journal of Geophysical Research: Oceans*, 130, e2025JC022843. <https://doi.org/10.1029/2025JC022843>

- Roderick, Michael & Shakespeare, Callum. (2024). 'Technical note: An assessment of the relative contribution of the Soret effect to open water evaporation.'  
<https://doi.org/10.5194/egusphere-2024-2023>
- Sarkar, S, Dalton, H, Giuliani, A, Phillips, D, Graham Pearson, D, Nowell, GM, Woodhead, JD, Hergt, J, Maas, R, Lynton Jaques, A, Chalapathi Rao, NV, Weiss, Y & Ghosh, S 2025, 'Extreme enriched-mantle (EM) compositions recorded by the Sr-Nd-Hf isotopes of global cratonic lamproites', *Geochimica et Cosmochimica Acta*, vol. 394, pp. 220-243.  
<https://doi.org/10.1016/j.gca.2025.02.014>
- Schmidt, Christina & Morrison, Adele & England, Matthew & Aguiar, Wilton & Gibson, Angus. (2025). 'Sensitivity of Antarctic Bottom Water Formation and Export to Horizontal Model Resolution.' *Journal of Advances in Modeling Earth Systems*. <https://doi.org/10.1029/2024MS004621>.
- Schneider, DP, Maher, N, Dong, Y, Kay, JE & Capotondi, A 2025, 'Observable polar and Atlantic sea surface salinity trends have emerged, while the noisy Indo-Pacific hesitates', *Environmental Research: Climate*, vol. 4, no. 4, 045002, pp. 1-20. <https://doi.org/10.1088/2752-5295/ae065b>
- Schroder, I, de Caritat, P, Huston, D & Champion, D 2025, 'Multivariate compositional analysis of groundwater geochemistry in the Georgina Basin: New insights for sediment-hosted mineral systems', *Journal of Geochemical Exploration*, vol. 278, 107857.  
<https://doi.org/10.1016/j.gexplo.2025.107857>
- Scott, W., Hoggard, M., Duvernay, T., Ghelichkhan, S., Gibson, A., Roberts, D., ... & Davies, D. R. (2025). Automated forward and adjoint modelling of viscoelastic deformation of the solid Earth. *EGUsphere*, 2025, 1-43.
- Senger, K, Ammerlaan, F, Betlem, P, Brönnner, M, Dumais, MA, Gellein, J, Henningsen, T, Janocha, J, Johannessen, EP, Liebsch, J, Machleidt, J, Mosočiová, T, Olausson, S, Olofsson, B, Rodes, N, Rylander, S, Shephard, GE, Smyrak-Sikora, A, Solano-Acosta, JD & Sterley, A 2025, 'Crustal Heterogeneity Onshore Central Spitsbergen: Insights From New Gravity and Vintage Geophysical Data', *Geochemistry, Geophysics, Geosystems*, vol. 26, no. 1, e2024GC011563, pp. 1-26. <https://doi.org/10.1029/2024GC011563>
- Senger, K, Ammerlaan, F, Betlem, P, Dumais, M-A, Eagles, G, Foster, W, Geissler, WH, Grundvåg, S-A, Hudson, A, Horota, RK, Hurum, JH, Jones, M, Kierulf, HP, Majka, J, Marsden, L, Michalski, K, Minakov, A, Ogata, K, Olausson, S, Osmundsen, PT, Planke, S, Ruppel, A, Sartell, AMR, Shephard, G, Śliwińska, KK, Smeraglia, L, Smyrak-Sikora, A, Spiegel-Behnke, C & Zuchuat, V 2025, *Geology of Svalbard: Deep-time and Deep-Earth (SVALGEOLOGY)*. Svalbard Integrated Arctic Earth Observing System. <https://doi.org/10.5281/zenodo.14425478>
- Senger, K., Betlem, P., Grundvåg, S.A., Jones, M., Kulhanek, D., , Madsen, L., Planke, S., Schad, S., Shephard, G.E., Śliwińska, K.K., Tarhan, L., Zuchuat, V. 2026. The deep-time climate archive of Svalbard (SVALGEOLOGY 2). <https://zenodo.org/records/17829839>
- Shakespeare, CJ & Roderick, ML 2025, 'The probability distribution of relative humidity in the lower troposphere', *Quarterly Journal of the Royal Meteorological Society*, vol. 151, no. 766, e4901. <https://doi.org/10.1002/qj.4901>
- Shephard, G.E., Abdelmalak, M.M., Faleide, J.I., Clennett, E., Zahirovic, S., Gac, S., Haas, P., Gaina, C. and Torsvik, T.H., 2026. Multi-phase intra-plate rifting and deformable plate modelling of the Northeast Atlantic back to the Permian. *Gondwana Research*, 149, pp.465-490.  
<https://doi.org/10.1016/j.gr.2025.09.002>

Shephard, G.E.. 2026. Chapter 17 False Islands of the Arctic: the Enigmatic and Enduring Arctic Landmass, Crockerland. In *Collecting the North* (Eds Kaasa, J., Delsett, L.L. and Spring, U.)v2, p.331-352 [https://doi.org/10.1163/9789004749665\\_018](https://doi.org/10.1163/9789004749665_018)

Sholeninova, P. & Morrison, A. & Hogg, A. & Foppert, Annie. (2025). 'Quantification of Antarctic Bottom Water Pathways in the Australian-Antarctic Basin.' *Journal of Geophysical Research: Oceans*. 130. <https://doi.org/10.1029/2024JC022305>

Smyrak-Sikora, A., Betlem, P., Engelschiøn, V.S., Foster, W.J., Grundvåg, S.A., Jelby, M.E., Jones, M.T., Shephard, G.E., Śliwińska, K.K., Vickers, M.L. and Zuchuat, V., 2025. Phanerozoic paleoenvironmental and paleoclimatic evolution in Svalbard. *Climate of the Past*, 21(11), pp.2133-2187. <https://doi.org/10.5194/cp-21-2133-2025>.

Spence, Paul & Menviel, Laurie & Morrison, Adele & Foppert, Annie & Silvano, Alessandro. (2025). On the Relationship between the Weddell Polynya and Antarctic Bottom Water Trends. *Journal of Climate*. vol. 38, no. 24. <https://doi.org/10.1175/JCLI-D-24-0179.1>

Sternai, P., Pilia, S., Ghelichkhan, S., Bouilhol, P., Menant, A., Davies, D.R., Ostorero, L., Vaes, B., Esposito, R., Garzanti, E. and Cloetingh, S., 2025. Raising the roof of the world: Intra-crustal Asian mantle supports the Himalayan-Tibetan orogen. *Tectonics*, 44(9), p.e2025TC009057.

Strzepek, RF, Latour, P, Ellwood, MJ, Shaked, Y & Boyd, PW 2025, 'Microbial competition for iron determines its availability to the ferrous wheel', *ISME Journal*, vol. 19, no. 1, wraf015. <https://doi.org/10.1093/ismejo/wraf015>

Suarez-Gutierrez, L., Maher, N. (2026) 'Temperature variability projections remain uncertain after constraining them to best performing Large Ensembles of individual Climate Models.' *Nat Commun* 17, 314. <https://doi.org/10.1038/s41467-025-67005-y>

Sudholz, ZJ, Alard, O, Jaques, AL, Yaxley, GM, Greau, Y & Frigo, C 2025, 'Metasomatic controls on the chemical and isotopic composition of zoned clinopyroxene xenocrysts from the Mount Hope kimberlite, Gawler Craton, Australia', *Lithos*, vol. 504-505, 108039. <https://doi.org/10.1016/j.lithos.2025.108039>, <https://doi.org/10.1016/j.lithos.2025.108039>

Sun, Y & Ellwood, MJ 2025, 'Calcium carbonate cycling in the Southern Ocean: insights from dissolved calcium and potential alkalinity tracers', *Limnology And Oceanography Letters*, vol. 10, no. 2, pp. 254-263. <https://doi.org/10.1002/lo2.10457>

Sun, W & Tkalčić, H 2025, 'Constraints on the Origin of the Martian Dichotomy From Southern Highlands Marsquakes', *Geophysical Research Letters*, vol. 52, no. 1, e2024GL110921. <https://doi.org/10.1029/2024GL110921>

Sun, W, Tkalčić, H, Chen, J & Wang, S 2025, 'Spectral characteristics and implications of located low-frequency marsquakes and impact events from InSight SEIS observations', *Physics of the Earth and Planetary Interiors*, vol. 361, 107334. <https://doi.org/10.1016/j.pepi.2025.107334>

Sweetman, James K., Shakespeare, Callum J. & Stewart, Kial D. (2025) 'The influence of ocean swell and wind waves on iceberg melting.' *Geophysical Research Letters* 52. <https://doi.org/10.1029/2025GL115392>

Taschetto, AS, Mcgregor, S, Dommenget, D, Gillett, ZE, Nicholls, N, Sharmila, S, van Rensch, P, Verdon-Kidd, D, Boschat, G, Chung, C, Lieber, R, Abram, N, Allan, R, Allen, K, Ashcroft, L, Brown, JR, Cai, W, Chand, S, Cowan, T, Dao, TL, De Burgh-Day, C, Freund, MB, Gallant, A, Gergis, J, Holbrook, NJ, Heidemann, H, Holgate, C, Hope, P, King, A, Lim, E-P, McBride, JL, McKay, RC, Nguyen, H, Pepler, A, Perkins-Kirkpatrick, S, Power, S, Risbey, JS, Santoso, A, Ummenhofer, CC, Wang, G & Zhang, X 2025, 'Climate impacts of the El Niño-Southern Oscillation on Australia', *Nature Reviews Earth & Environment*. <https://doi.org/10.1038/s43017-025-00747-x>

Tran, TL, Fan, J, Rosenfeld, D, Zhang, Y, Cleugh, H, Hogg, AMC & Prinsley, R 2025, 'Investigation of the Sensitivity of Tropical Cyclogenesis to Aerosol Intervention', *Journal of Geophysical Research: Atmospheres*, vol. 130, no. 8, e2024JD041600. <https://doi.org/10.1029/2024JD041600>

Treguier, AM, de Boyer Montégut, C, Yeager, S, Chassignet, EP, Iovino, D, Kiss, AE, Lin, P, Lique, C & Sidorenko, D 2025, 'Multidecadal Trends of the Mixed Layer Depth and Their Relation to the Wind in Global Ocean Models Forced by an Atmospheric Reanalysis', *Journal of Geophysical Research: Oceans*, vol. 130, no. 5, e2024JC022271. <https://doi.org/10.1029/2024JC022271>

Vaiglova, P, Kierdorf, H, Witzel, C, Falster, G, Joannes-Boyau, R, Wang, Y, Wu, J, Williams, I, Knowles, B, Wu, Y, Bangsgaard, P, Yeomans, L, Richter, T & Darabi, H 2025, 'Transport of animals underpinned ritual feasting at the onset of the Neolithic in southwestern Asia', *Communications Earth and Environment*, vol. 6, no. 1, 519. <https://doi.org/10.1038/s43247-025-02501-z>

Van Kranendonk, MJ, Nutman, AP, Friend, CRL & Bennett, VC 2025, 'A review of 3.7 Ga stromatolites from the Isua Supracrustal Belt, West Greenland', *Earth-Science Reviews*, vol. 262, 105034. <https://doi.org/10.1016/j.earscirev.2024.105034>

Waldien, TS, Miller, MS & Roeske, SM 2025, *Geologic Evolution of the Denali Fault System and Associated Crustal Structure. in Tectonics and Seismic Structure of Alaska and Northwestern Canada: EarthScope and Beyond*. Wiley, pp. 547-574. <https://doi.org/10.1002/9781394195947.ch20>

Wang, S, Zhou, T, Anenburg, M, Hollings, P, Zhang, L, Fan, Y, Cooke, DR & Fu, B 2025, 'Metal scavenging by sulfide oxidation in porphyry copper deposit root zones', *Communications Earth and Environment*, vol. 6, no. 1, 876, pp. 1-10. <https://doi.org/10.1038/s43247-025-02830-z>

Webster, JM, Yokoyama, Y, Humblet, M, Braga, JC, Esat, T, Fallon, S & Bard, E 2025, 'Constraints on sea-level rise during meltwater pulse 1B from the Great Barrier Reef', *Nature Communications*, vol. 16, no. 1, 4698. <https://doi.org/10.1038/s41467-025-59858-0>

Williams, IS, McCulloch, MT & Beams, SD 2025, 'Chemical and isotopic evidence from the laterally asymmetric Bega Batholith for protracted Devonian fluid-induced infracrustal partial melting, eastern Lachlan Fold Belt, southeastern Australia', *Chemical Geology*, vol. 678, 122667. <https://doi.org/10.1016/j.chemgeo.2025.122667>

Williamson, M.C., Shephard, G.E., Boggild, K., Carey, R., Hamilton, P.B., Kellett, D., Miggins, D., Koppers, A.A., Wilton, D.H., MacDonald, D.J. and Weis, D., 2026. A sample dredged from the Alpha Ridge records evidence of an emergent volcanic setting at 90 Ma. *Communications Earth & Environment*, 7(1), p.32. <https://doi.org/10.1038/s43247-025-02981-z>

Xing, C, Stevenson, S, Di Lorenzo, E, Newman, M, Capotondi, A, Fasullo, J & Maher, N 2025, 'Apparent Changes in Pacific Decadal Variability Caused by Anthropogenically Induced Mean State Modulations', *Geophysical Research Letters*, vol. 52, no. 20, e2025GL116499. <https://doi.org/10.1029/2025GL116499>

Yang, X, Jiang, C, Luo, Y, Chu, R & Yang, Y 2025, 'Lithosphere-Asthenosphere Interaction Beneath the Southeastern Tibetan Plateau From Joint Rayleigh and S Wave Tomography', *Journal of Geophysical Research: Solid Earth*, vol. 130, no. 2, e2024JB030181. <https://doi.org/10.1029/2024JB030181>

Yung, C. K., Rosevear, M. G., Morrison, A. K., Hogg, A. McC., and Nakayama, Y. (2025) 'Stratified suppression of turbulence in an ice shelf basal melt parameterisation', *The Cryosphere*, 19, 5827–5861, <https://doi.org/10.5194/tc-19-5827-2025>

Zhang, Y, Li, G, Yu, J, Zhong, Y, Du, J, Gong, X, Jiang, X, Gai, C, Li, S & Liu, Q 2025, 'Response of atmospheric CO2 changes to the Abyssal Pacific overturning during the last glacial cycle', *Global and Planetary Change*, vol. 244, 104636. <https://doi.org/10.1016/j.gloplacha.2024.104636>

Zhang, Q, Roberts, AP, Yao, Z, Shi, X, Hao, Q, Ju, L, Tang, X, Liu, J, Liu, S & Liu, Q 2025, 'Does Eolian Flux to the Northwest Pacific Ocean Reflect Persistent Asian Interior Aridity on Orbital Timescales?', *Geophysical Research Letters*, vol. 52, no. 2, e2024GL112599. <https://doi.org/10.1029/2024GL112599>

Zhao, S, Cummins, PR, McClusky, S & Miller, MS 2025, 'Interseismic Coupling Along the Java-Timor Subduction-Collision Zone at East Indonesia', *Geophysical Research Letters*, vol. 52, no. 6, e2024GL112563. <https://doi.org/10.1029/2024GL112563>

Zhong, Y, Lu, Z, Kaboth-Bahr, S, Yu, J, Horikawa, K, Dekkers, MJ, Larrasoana, JC, Clift, PD, Weber, ME, Vermassen, F, Kender, S, Sun, C, Yang, H, Wang, X, Andresen, CS, Liu, Y, Zhang, H, Dai, Z, Niu, L, Zhang, J, Feng, X, Zhao, D, Xia, W, Yang, S, Li, H & Liu, Q 2025, 'Precession modulates the poleward expansion of atmospheric circulation to the Arctic Ocean', *Nature Communications*, vol. 16, 1143. <https://doi.org/10.1038/s41467-025-56542-1>

Zhong, Y, Li, Z, Shi, X, Isson, T, Yu, J, Kender, S, Liang, Z, Swann, GEA, Pullen, A, Weber, ME, Du, J, Larrasoana, JC, Zhang, J, Song, Y, González, FJ, Kaboth-Bahr, S, Li, H, Zhang, Q, Zhao, D, Cao, W, Zhao, M & Liu, Q 2025, 'Enhanced phosphorus weathering contributed to Late Miocene cooling', *Nature Communications*, vol. 16, 1124. <https://doi.org/10.1038/s41467-025-56477-7>

Pacific Highs Working Group, Griffith, EM & Westerhold, T 2025, 'Pacific Highs: A Treasure Trove of Past Warm Climate Archives', *Paleoceanography and Paleoclimatology*, vol. 40, no. 6, e2025PA005133. <https://doi.org/10.1029/2025PA005133>

# EXTERNAL COMMITTEES AND EDITORIAL BOARDS

NAME	POSITION	COMMITTEE / BOARD
Prof. N. Abram	Member	Advisory board, EU Deep ice project
	Member	Scientific advisory board, Million Year Ice Core project
	Member	Australian Antarctic Science Council
	Chair	AAS National Committee for Antarctic Research
	Member	ANU Institute for climate, energy and disaster solutions advisory board
	Australian Delegate	Scientific Committee for Antarctic Science
	Co-lead	Past Global Changes (PAGES) 2k CoralHydro2k working group
	Australian representative	International Partnerships in Ice Core Sciences
	Editor	Climate of the Past
Dr. Michael Anenburg	Editorial Board Member	Geology
Em. Prof. V. Bennett	Member	Nominations Committee, Geochemical Society
	Member	Journal of Petrology Advisory Board
Prof. A.J. Berry	Editorial Board Member	Minerals
Prof. J.J. Brocks	Associate Editor	Geochimica et Cosmochimica Acta
	Editorial Board Member	Geobiology
	Selection Panel	RG Menzies Scholarship to Harvard University
Prof. P. Cummins	Editorial Board member	Earth, Planets and Space
Dr. C.M. Eakin	ANU representative	ANSIR (Australian National Seismic Imaging Resource) EGU Early Career Award Committee -
	Member	Seismology Division

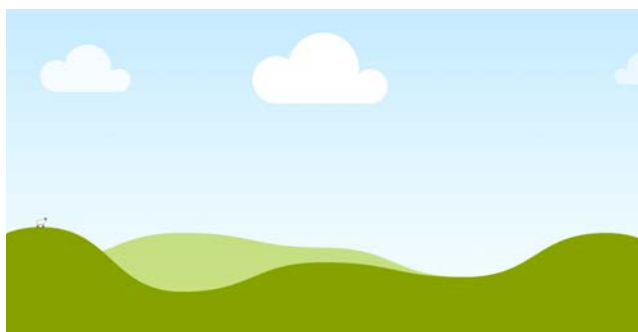
TBD



External Committees & Editorial Boards

NAME	POSITION	COMMITTEE / BOARD
G.M Gibson	Scientific Reviewer & Member, Editorial Board	Minerals (Journal)
Prof. A. Hogg	Member	National Partnership for Climate Projections Steering Committee, DCCEEW
Em. Prof. I. Jackson	Chair	National Committee for Earth Sciences, Australian Academy of Science
Chengxin Jiang	Member, Editorial Board	Journal of Earth, Space and Planet
Prof. D. Jacob	President	International Association of Geoanalysts (IAG)
	Editorial Board member	Gems & Gemology
Prof. Penny King	Member	NASA Mars Exploration Program Advisory Committee Mars Sample Return
Prof. M.S. Miller	Program Director	AuScope Earth Imaging Program
	Honours Committee	Seismological Society of America
	DEI Committee	Seismological Society of America
	Travel Grant Committee	Seismological Society of America
	Dorothy Hill Award Committee	Australian Academy of Sciences
Prof. L.N. Moresi	Program lead	AuScope Simulation, Analysis and Modelling
	Chair	NASA SciX advisory board
	Co-lead	Computational Infrastructure in Geodynamics (NSF supported)
	Member	Teacher Earth Science Education Program - Advisory Committee
	Member	Community Infrastructure for Geodynamics Executive committee ( <a href="http://www.geodynamics.org">www.geodynamics.org</a> ).
	Board Member	Teacher Earth Science Education Programme
Dr. M. Norman	Science Editor	GEOLOGY (Geological Society of America)
Prof. B. Pillans	Chair	National Rock Garden Steering Committee
	Director	National Rock Garden

TBD



TBD

Red text: information from 2024 to be verified for 2025

External Committees & Editorial Boards

NAME	POSITION	COMMITTEE / BOARD
Prof. A.P. Roberts	Member	Proposal Evaluation Panel for research at Mario Zucchelli Station, Antarctica, Programma Nazionale di Ricerche in Antartide (National Antarctic Research Program), Ministry of Universities and Research, Italy
	Member	College of Assessors, New Zealand Ministry of Business Innovation and Employment
	Member	Canvassing Committee, Geomagnetism, Paleomagnetism and Electromagnetism Section, American Geophysical Union
	Plenary Lecture	Australian Earth Science Convention, Perth, Australia
	Speaker	Mawson Medal Lecture, Australian Academy of Science
	Invited speaker	FORC Workshop, Institute for Rock Magnetism, Minneapolis, USA
	Session chair	Dynamic Earth Special Symposium: Rock magnetism, Global reconstruction and supercontinent cycles, Australian Earth Science Convention, Perth, Australia
	Session chair	Iron cycling in natural and anthropogenic environments, Conference on Rock Magnetism, Minneapolis, Minnesota, USA
Prof. M. Sambridge	Member	Physical Sciences - Prime Ministers prizes for Science committee
	Vice President	Australian Academy of Science for the Physical Sciences
	Physical Sciences Secretary	Australian Academy of Science
	Member	Australian Academy of Science - Awards review committee
	Physical Sciences lead	Australian Academy of Science Champions of diversity group
	Chair	Presidential Nominating Committee for the Australian Academy of Sciences
	Chair	Bye-law review committee, Australian Academy of Sciences
	Chair	European Geosciences Union Gutenberg medal committee

External Committees & Editorial Boards

NAME	POSITION	COMMITTEE / BOARD
Prof. H. Tkalčić	Chair	American Geophysical Union Seismology Section Fellows Review Committee
	Member	Australian Academy of Science Research Mobility Grants Assessment Panel
	Member	International Association of Seismology and Physics of the Earth's Interior (IASPEI/IUGG) - Executive Committee (elected)
	Member	Study of the Earth's Deep Interior (SEDI/IUGG) - Executive Committee
	Member	Geofizika – Editorial Board
	Member	Physics of the Earth and Planetary Interiors (PEPI) – Editorial Board
	Member	Scientific Reports – Editorial Board
	Proposal evaluator	US National Science Foundation Geophysics Program (NSF)
	Proposal evaluator	Australian Research Council (ARC)
	Proposal evaluator	ETH Zürich Grants (ETH; Switzerland)
	Proposal evaluator	Deutsche Forschungsgemeinschaft (DFG; Germany)
	Proposal evaluator	European Research Council (ERC)
Hon. Prof. L. Wyborn	Member	EGU Earth and Space Science Informatics Committee
	Member	AGU Indigenous Action Task Force
Prof. G.M. Yaxley	Member	Centre for Advanced Microscopy (CAM) Scientific Steering Committee

# STUDENT NEWS

## Open Day

Held on the 29<sup>th</sup> of March 2025 in the Mary Reay Building, the open day was organised by the department with numerous students coming to present Earth Sciences to the public and prospective students. This included animations around various displays representing different facets of the science done at the department.



## After work dinners

Hosted once every 3 weeks, usually on Fridays to celebrate weeks of hard work and the upcoming weekend! Always fun to join, it is a good time to ask your colleagues and friends what struggle they ran into this week and trauma bond. Peak PhD experience.



**Welcome coffee for new HDR students**

*Organised by the Student Representatives*

Every starting HDR student is invited to a welcome coffee/tea to get to know the department, the campus, and the life in Canberra. The main goal is to offer an informal space to ask questions, get in touch with the students and feel more comfortable with life at ANU.

**Geoball**

*Organised by the ANU EMS Society*

Geoball was held on the 23 August 2025 at the Hellenic Club in the City. This year's theme was "Volcanic Vogue" where attendees showcased their explosive elegance.



**Welcome coffee for new HDR students**

*Organised by the Student Representatives*

**Christmas party**

Towards the end of the year in mid-December, a Christmas party was organised. The department enjoyed jolly hours, gathering everyone around food and drinks. A good way to end a very full year!

**Canberra Royal Show**

For the first time, RSES had a stall at the infamous Canberra Royal Show. Over the 20<sup>th</sup> and 21<sup>st</sup> of February, students and staff presented Earth Sciences to the public. From kids jumping and competing to create the biggest earthquake, to adults learning about drill cores and space missions, there was something for everyone to enjoy!



# Student Representatives

Jackson Copeland  
Salome Urien

# Fieldtrips

## NSW South Coast

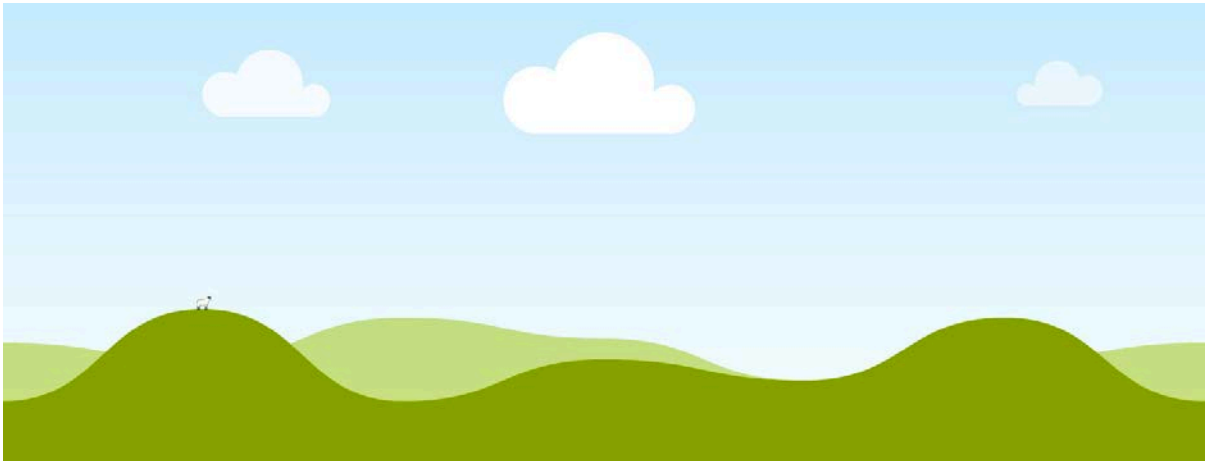


During the mid-semester break, 61 enthusiastic first-year students from EMSC1008 (EARTH) took their learning outdoors, exploring the spectacular geology of the NSW South Coast. Over the week, they developed key field skills including geological mapping, cross-section construction, and stratigraphic column building - all while recording their observations and interpretations in field notebooks.

Special thanks to Andrew Berry for leading the adventure, and to Laura Crisp, Mark Hoggard, Caroline Eakin, Edgar Leong, Oliver Medd, and Oliver Hsu for their fantastic support in the field. Shout-out to Kevin Thow for flawless admin support that ensured a smooth and successful trip!

Credit: TBD

## Understanding Geological Hazards trip



tbd

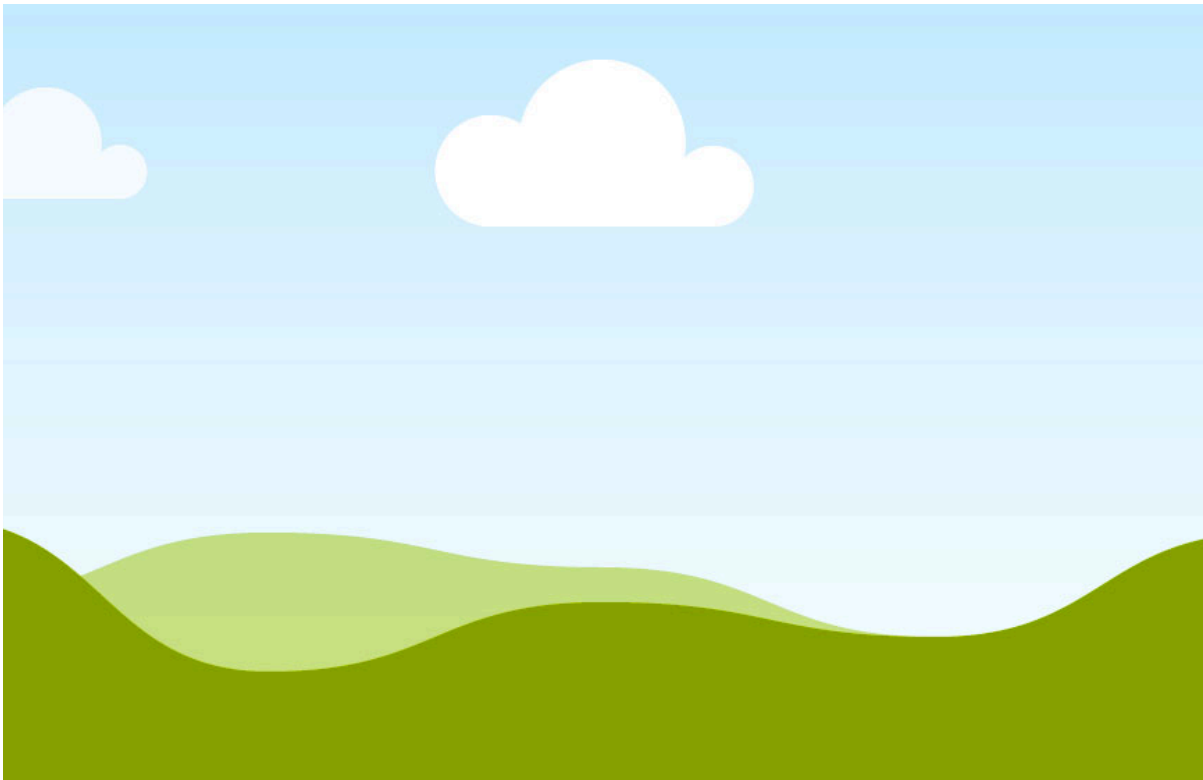
Wee Jasper Field Trip



The 2025 EMSC2023 class spent a pleasant week roaming the countryside out at the Cavan property near Wee Jasper. There, they mapped the folded Siluro-Devonian volcanoclastic, red-bed and limestone strata of three overlapping areas that had not been mapped by ANU students in several decades. The students gained first-hand experience in the complexities of field structural geology, stratigraphy and sedimentary depositional basins, and learnt fieldcraft that will be invaluable to them as they progress through the earth sciences and careers.

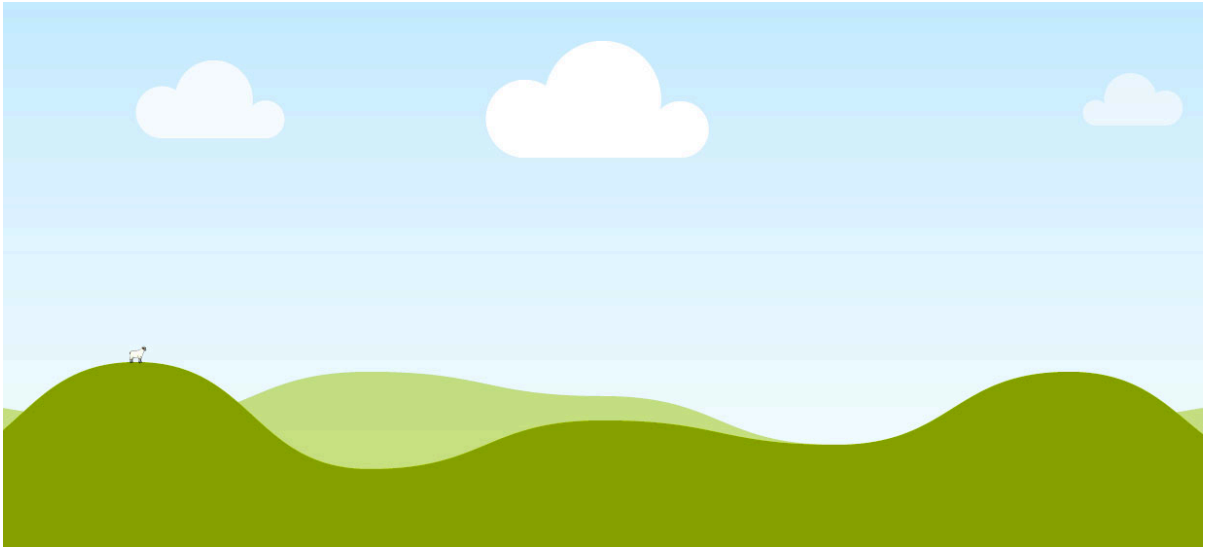
TBD

Cooma Field Trip



TBD

Snowy Mountains Fieldtrip



TBD

Planetary Science

tbd

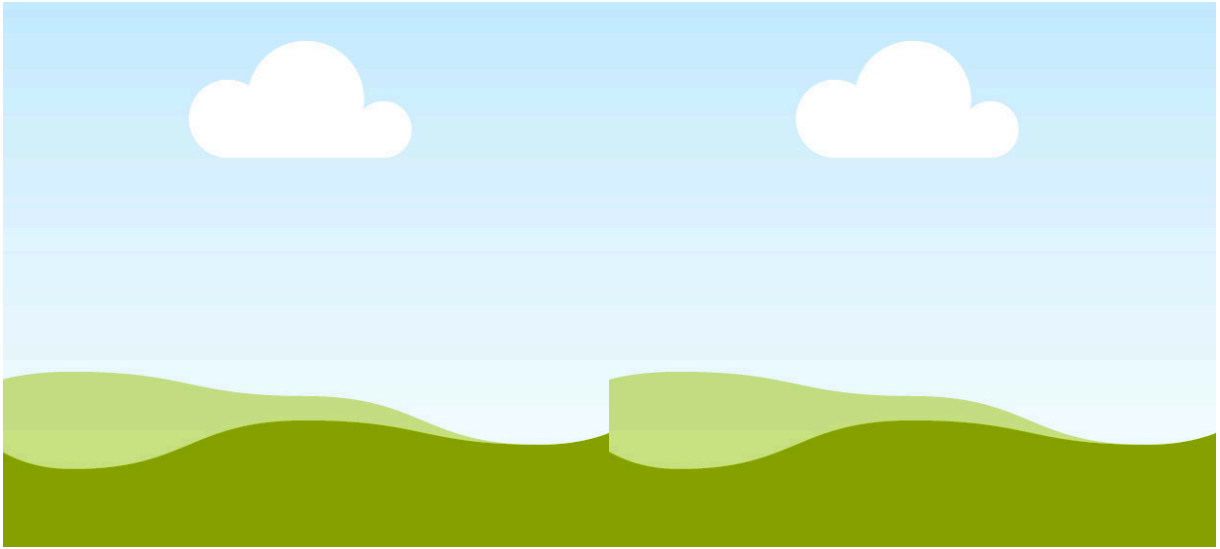


TBD

Fieldtrips (continued)

TBD

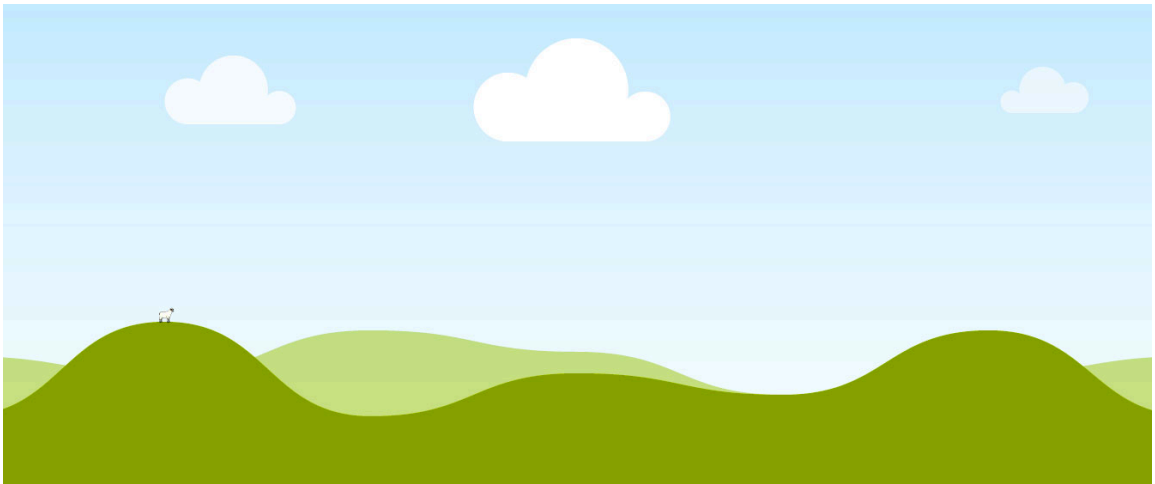
Coral Reef Field Studies



TBD

NAROOMA - MARINE  
BIOGEOCHEMISTRY

TBD



TBD

TBD

Fieldtrips (continued)

Students in Japan

In September, ten undergraduate students from RSES and CPAS visited Japan for a joint course with the University of Tokyo, Natural Hazards: Risk and Resilience in Japan. During their teaching break, the ANU students worked closely with their Tokyo peers, not only exploring natural hazards through hands-on learning, but also sharing cultural perspectives and building new friendships. Activities included visiting areas affected by the 2011 Great East Japan Earthquake and Tsunami, and hiking on Mt. Fuji to study volcanic hazards.

Photo: ANU and University of Tokyo students climb the 14.6-metre seawall built to protect the town of Ōtsuchi in Iwate Prefecture from tsunamis.



# 2025 Scholarship Recipients



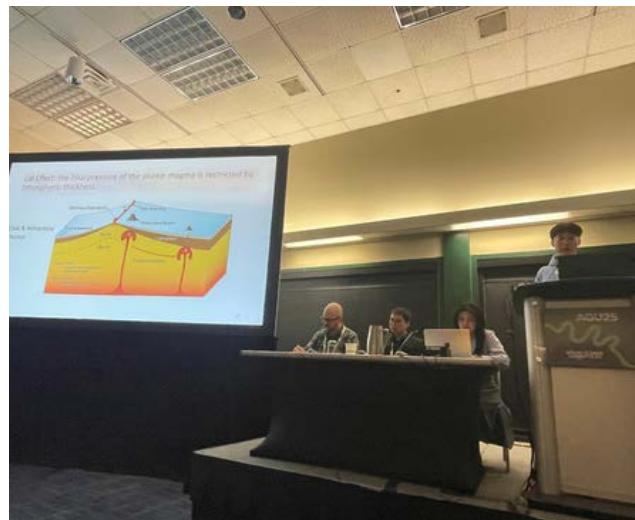
## Anupiya Ellepola

I was fortunate to receive the Mervyn and Katalin Paterson Travel Fellowship for the year 2025 as a student of the RSES. This scholarship gave me the opportunity to attend my first international Summer school. Using the funds made available through the scholarship I attended the "Fluid Dynamics of Sustainability and the Environment summer school" (FDSE) that was held at Cambridge University over a period of two weeks. Joining this summer school was a highlight of my PhD program as I was able to study course material relevant to my research through a structured program. I also got the opportunity to talk with many experts who taught during the summer school. I also had the opportunity to interact and make connections with the students who attended the summer school. Apart from the academic work, I also got the opportunity to explore parts of UK with some of the students from the summer school. Overall this was a wonderful career development opportunity for me that was made possible by the travel fellowship.

## Shihao Jiang

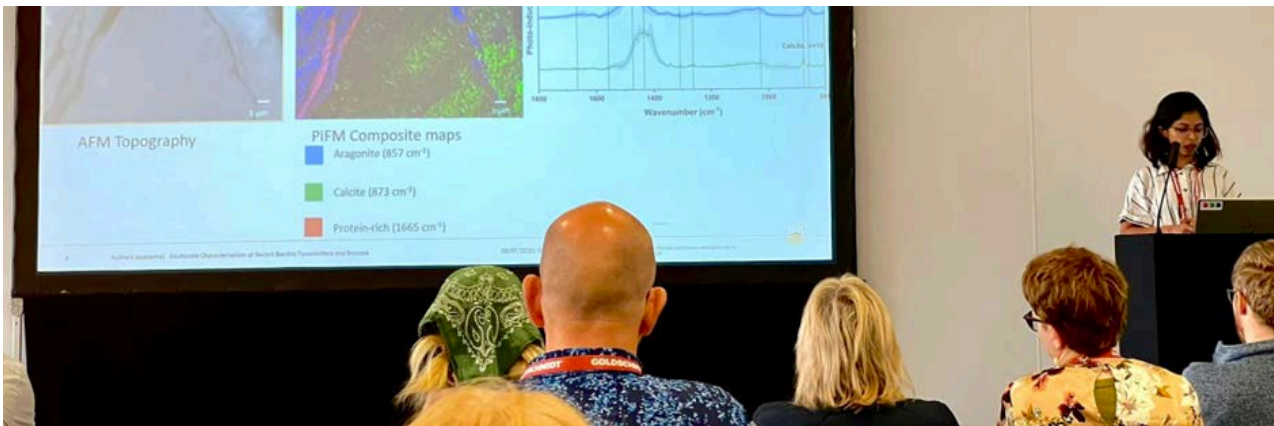
It was a great pleasure and honour to receive the Mervyn and Katalin Paterson Scholarship to support my travel last year. The experience was academically transformative and significantly broadened my research perspective. During my visit to Caltech, I had the opportunity to engage in discussions with the geodynamics group led by Professor Mike Gurnis and the geochemistry group led by Professor Paul Asimow. From my conversations with the geodynamics team, I gained deeper insight into advanced modelling strategies for large-scale mantle convection and its coupling with lithospheric deformation, crustal evolution, and seismic observations. I learned how numerical simulations are integrated with geophysical constraints, and how mantle flow patterns can be linked to observable surface tectonics. Through discussions with the geochemistry group, I learned about recent developments in thermobarometry and how experimental petrology, mineral chemistry, and melt inclusions are used to constrain pressure and temperature conditions of mantle processes. I also gained a clearer understanding of the assumptions and limitations behind different thermobarometric approaches, which will help me apply these methods more critically and rigorously in my own research.

In addition, I attended the AGU Fall Meeting, where I delivered two presentations. This provided valuable experience in communicating my research to an international audience and receiving constructive feedback from experts in related fields. The conference exposed me to emerging global trends and "hot topics" in Earth sciences, including advances in mantle dynamics, geochemical tracing, and high-resolution geophysical imaging. Engaging with researchers from diverse backgrounds broadened my scientific outlook and helped me better position my work within the wider Earth science community.



## Kushani Jayasoma

I am very grateful to have been the recipient of the 2025 DA Brown Scholarship, which supported my research travel to Europe last year. Through this support, I was able to attend to the Goldschmidt Conference in Prague, Czech Republic, held on 6-11 July 2025. There, I presented my research titled “Multiscale characterization of recent benthic foraminifera and Bryozoa: Essential prerequisites for robust proxy archives” as an oral presentation. Presenting my work at Goldschmidt was a fantastic experience. I received constructive comments and connected with researchers working in similar areas. I also attended workshops focused on improving scientific writing skills. Following the conference, I visited ETH Zürich university to carry out analytical work that is a key part of my PhD research. Access to the facilities and expertise at ETH supported my project and provided new insights into my data. The DA Brown Scholarship made both the conference participation and the research visit possible, and I am sincerely thankful for the opportunity to expand my research skills and international academic network through this support.



## Rodrigo Freitas Rodrigues

The Sue Kesson Experimental Petrology Travel Grant was awarded to cover travel expenses to Europe between June and July 2025. This trip comprised laboratory work, meetings, and participation in two international conferences. Between 16th June and 20th July, I attended the Experimental Mineralogy, Petrology and Geochemistry (EMPG) conference in Orléans, France. At this conference, I had the opportunity to present my experimental results to a large audience of experimental petrologists in a session titled Earth's Mantle and Core. In my talk (Fig. 1), titled: Comparative phase relations of garnet lherzolite derived from partial melting experiments and thermodynamic modelling at 5 GPa, I highlighted the importance of phase mapping in documenting experimental charges and the reliability of thermodynamic modelling in reproducing high-pressure experimental results.

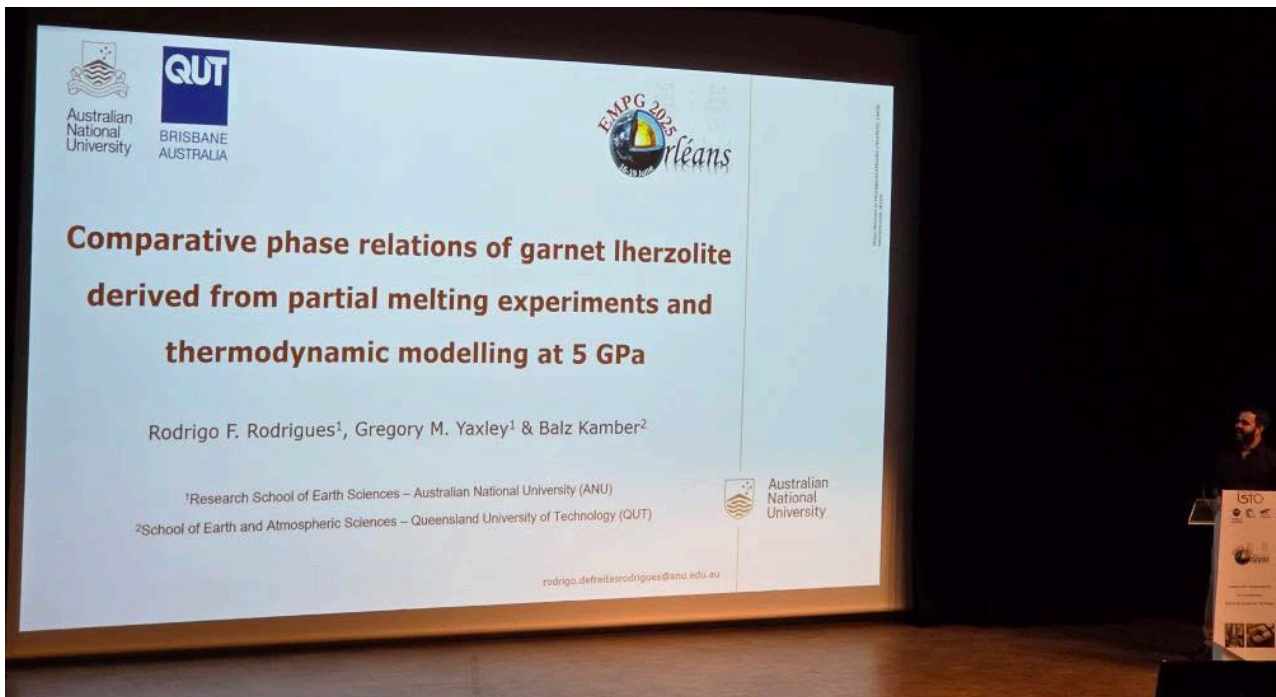


Figure 1. Presentation at the Experimental Mineralogy, Petrology and Geochemistry (EMPG) conference in Orléans, France.

From 21st June to 5th July, I was at the University of Leeds, a world leader in the study of the microstructures of crustal- and mantle-derived rocks. During this period, I learned how to obtain and interpret EBSD data, a technique rarely used for experimental samples. The EBSD maps enable the identification of microstructures indicative of melt-rock interaction, reinforcing my hypothesis that Archaean orthopyroxene-rich peridotites were formed by the interaction of an ultramafic melt with the depleted protocratonic lithosphere. The EBSD data were incorporated into a manuscript recently submitted to *Geochimica et Cosmochimica Acta*, titled: Mg/Si systematics of the Earth's Archaean mantle caused by deep melt-solid interaction: insights from reaction experiments.

From 6th to 12th July, I attended the Goldschmidt Conference in Prague, Czech Republic. During the conference, I presented two posters and one talk on behalf of Prof. Balz Kamber. The first poster was titled Exploring phase relations in high PT experimental charges with phase maps, and the second was titled Experimental insight into komatiite-harzburgite reactions at 3 GPa. The talk, Silica metasomatism by reactive flow of komatiite through cratonic harzburgite (Fig. 2), was presented in the section Metasomatism and crust-mantle interaction in intra-plate settings, divergent and convergent margins.

Figure 2. Presentation at the Goldschmidt conference in Prague, Czech Republic.





Australian  
National  
University

Research School  
of Earth Sciences

## Contact Us

Research School of Earth Sciences  
Australian National University  
142 Mills Road, Acton ACT 2601

**T** +61 2 6125 3406

**E** [reception.rses@anu.edu.au](mailto:reception.rses@anu.edu.au)

**W** <https://www.earthsciences.anu.edu.au>



[facebook.com/aneearthsciences](https://www.facebook.com/aneearthsciences)



[twitter.com/aneearthsciences](https://twitter.com/aneearthsciences)



[instagram.com/aneearthsciences](https://www.instagram.com/aneearthsciences)



[youtube.com/ResearchSchoolofEarthSciences](https://www.youtube.com/ResearchSchoolofEarthSciences)



[LinkedIn/anu-research-school-of-earth-sciences](https://www.linkedin.com/company/anu-research-school-of-earth-sciences)



Future students enquiry: 1800 620 032