



4DWC

4th Deepwater Circulation Research Conference



Programme
Edinburgh
24-26 May 2023



The 4th Deep Water Circulation Research Conference

Edinburgh, Scotland, 24-26 May 2023

Programme & Schedule

Conference website: www.4dwc.hw.ac.uk

Convener and Contact: d.stow@hw.ac.uk

Organising Committee:

Dorrik, Zeinab, Uisdean, Tom, Deborah, Heather, Helen, Nicola, Gayle

Student support: Jiawei, Kachi, Elizabeth, Deron, Ben, Jonathan



Conference Programme

Tues 23rd **Arrival and free time.** Please contact the organisers for any suggestions. The Icebreaker Reception will now be on Wednesday 24th (see below)

Weds 24th **Royal Society of Edinburgh, 22-26 George Street**
08:00-09:00 Registration and set-up of posters
09:00-16:45 Conference keynotes, papers, posters and discussion.
16:45-18:45 Building Stones of Edinburgh tour
18:30-late: Icebreaker reception and buffet, The Dome, George Street

Thurs 25th **Royal Society of Edinburgh, 22-26 George Street**
08:00-09:00 Morning coffee and posters
09:00-17:15 Conference keynotes, papers, posters and discussion.
18:30-late: Conference Dinner, The Heights, Apex Grassmarket Hotel

Friday 26th **Lyell Centre, Heriot Watt University, Riccarton Campus**
10:00-10:30 Arrival and Coffee
10:30-15:30 Workshops and discussion
15:30 Closing drinks, Howff, top floor, Lyell Centre

Discussion Workshops

Deep Ocean Drilling: An IODP Workshop. Facilitated by Uisdean Nicholson, Michele Rebesco and Lorna Strachan

Contourites and ocean hazards: slope instability and tsunami genesis. Facilitated by Dorrik Stow and Naohisa Nishida. Sponsored by JSPS (Japan Society for the Promotion of Science)

Deepwater Sediments, Hybrid Systems and Core Workshop. Facilitated by Zeinab Smillie. Cores supplied by BOSCORF (British Ocean Sediment Core Research Facility)

Mini-discussion groups. These may include: (a) *Modelling, flume experiments and seafloor observations*; (b) *Hybrid systems: contourites, turbidites and hemipelagites*.

Keynote Presentations

Elda Miramontes (MARUM, Bremen): *Can internal waves control the formation of channels, contourite drifts and cold-water coral mounds in upper continental slopes?*

Javier Hernandez-Molina (Royal Holloway, London): *Everything You Always Wanted to Know About Contourites (But Were Afraid to Ask)*

Lesli Wood (Colorado School of Mines, Denver): *“Deepwater” processes and deposits in shelfal and upper slope settings: A reconsideration of paradigms.*

Michele Rebesco (OGS, Trieste): *Contourite features: new observations and process implications*

Detailed Schedule

Wednesday 24th May Oral presentations

Royal Society of Edinburgh, George Street, Edinburgh

Listed in order of presentation and by first author only – see abstracts volume for full authorship and affiliations

08:00-09:00 Registration and Coffee; Poster Placement

09:00-09:15 Dorrik Stow – *Welcome and Introduction*

09:15-09:45 Javier Hernández-Molina (Royal Holloway London) *KEYNOTE Everything You Always Wanted to Know About Contourites* (*But Were Afraid to Ask)*

09:45-10:00 Uisdean Nicholson: *Ocean currents as conveyor belts for potentially tsunamigenic 'submarine landslide factories': case studies from the Antarctic Circumpolar Current and Indonesian Throughflow*

10:00-10:15 Nick McCave: *One million years of Mediterranean Outflow strength*

10:15-10:30 Tilmann Schwenck: *Complex cut-and-fill structures within the Ewing Terrace reveal a highly dynamic bottom current regime at the Argentine Margin since the Early Miocene*

10:30-11:15 Coffee and Posters

11:15-11:30 Sara Rodrigues: *Cretaceous South Atlantic contourite and mixed depositional systems*

11:30-11:45 Volkhard Spiess: *Overview of current-controlled depositional patterns at the Southwest African continental margin*

11:45-12:00 Dierk Hebbeln: *Fast growing cold-water coral mounds are fed by fine sediments missing from the contemporary coarsest contourite sequences*

12:00-12:15 Sergio Ando: *How to characterize the mineralogical composition and provenance of contourites and associated sediments coupling optical microscopy and Raman spectroscopy*

12:15-14:00 Lunch and Posters

14:00-14:30 Lesli Wood (Colorado School of Mines, Denver) *KEYNOTE "Deepwater" processes and deposits in shelfal and upper slope settings: A reconsideration of paradigms*

14:30-14:45 Dorrik Stow: *Anatomy of the bi-gradational contourite sequence: implications for the depositional process*

14:45-15:00 Olmo Miguel Salaz: *Deep-sea neoichnology: new in-situ observations on bottom current affected settings*

15:00-15:15 Javier Dorador: *The use of linear and circumferential laminography for ichnological analysis of deep-sea sediments research: somewhere between 2D and 3D analysis*

15:15-15:45 Coffee and Posters

15:45-16:00 Alfred Uchman: *Contourites and their ichnology in Lower Jurassic deposits from the Mochras drill core, Cardigan Bay Basin, UK*

16:00-16:15 Jiawei Pan: Geostatistical analysis of cyclicity in deep marine facies

16:15-16:30 Javier Hernandez-Molina: *IODP Expedition 401: Investigating Miocene Mediterranean-Atlantic Gateway Exchange (IMMAGE)*

16:30-16:45 Discussion and Day 1 wrap-up

**16:45-18:45 Building Stones of Edinburgh Tour
OR free time to explore the city centre**

18:30 – late: Icebreaker Reception Drinks and Buffet, The Dome, 14 George Street

Thursday 25th May Oral presentations

Royal Society of Edinburgh, George Street, Edinburgh

Listed in order of presentation by first author only – see abstracts volume for full authorship and affiliations

08:00-09:00 Coffee and Posters

09:00-09:15 Dorrik Stow (Heriot Watt University) – *Introduction and Publications*

09:15-09:45 Elda Miramontes (MARUM, Bremen) **KEYNOTE**

Can internal waves control the formation of channels, contourite drifts and cold-water coral mounds in upper continental slopes?

09:45-10:00 Henriette Wilckens: *Self-emerging contourite system in a flume tank demonstrates the conditions necessary to form moat-drift-systems*

10:00-10:15 Pelle Adema: *Analogue experiments of mixed turbidite-contourite systems: linking flow dynamics to grainsize trends*

10:15-10:30 Dongxiao Wang: *Deep-Current Intra-seasonal Variability Interpreted as Topographic Rossby Waves and Deep Eddies in the Xisha Islands of the South China Sea*

10:30-11:15 Coffee and Posters

11:15-11:30 Gabrielle Uenzelmann: *Deep water incursions slow offshore West Antarctic Ice Sheet expansion during its early formation*

11:30-11:45 Gaston Krepps: *Bottom current dynamics and its impact on sedimentation in the Drake Passage*

11:45-12:00 Kachi Ibezim: *Seismic stratigraphy of an Eocene-Pliocene mixed depositional system on the SE New Zealand continental margin, Great South Basin*

12:00-12:15 Melissa Johansson: *Geomorphology of deep marine sediments, Northwest Borneo*

12:15-14:00 Lunch and Posters

14:00-14:30 Michele Rebesco (OGS, Trieste) *KEYNOTE Contourite features: new observations and process implications*

14:30-14:45 Debora Duarte: *Decoding the evolution of the Equatorial Atlantic Gateway: evidence of mid-Cretaceous deep-water circulation from sediment waves and contourite drifts, offshore Guinea (initial results)*

14:45-15:00 Arved Gibb: *Frasnian contourite channel-drift system: Dense shelf-water cascading of anoxic water from the northern Gondwana Epeiric Sea (Tafilalt, Morocco)*

15:00-15:15 Alastair Robertson: *Deep-water depositional processes in an Upper Cretaceous Neotethyan intra-continental fore-arc basin (Kannaviou Formation, W Cyprus)*

15:15-15:45 Coffee and Posters

15:45-16:00 Selin Coskun: *Sediment waves as a tool to understand deep-water current evolution, Senegal Basin, NW Africa*

16:00-16:15 Xingxing Wang: *Bottom current sediment waves control origins of submarine canyons*

16:15-16:30 Gilbert Changwain: *3D Seismic Sequence Stratigraphy, Erosional Surfaces, and Implications for Hydrocarbon Prospect Generation in the N'kapa Formation, Douala Sub-Basin, Cameroon*

16:30-16:45 Yanwe Zhang: *Frequent and prolonged Deep-sea Turbidity Currents triggered by typhoon and earthquake in the Gaoping Submarine Canyon*

16:45-17:00 Discussion and Day 2 wrap-up

Walk across the city from the Royal Society (New Town) to the Grassmarket (Old Town). Make your own way or be guided by one of our volunteers.

18:30 Arrival and pre-drinks – at the Apex Grassmarket Hotel

19:00 Conference Dinner (free to all delegates) – The Heights restaurant at the Apex Grassmarket Hotel overlooking Edinburgh Castle

24-25th May Poster presentations

Royal Society of Edinburgh: Wednesday and Thursday 24-25 May

Listed alphabetically by first author – see abstracts volume for affiliations

Contourite stratigraphic models linked to Light Intermediate versus Dense Deep Mediterranean Waters flow regime variations (Alboran Sea, SW Mediterranean)

B. Alonso¹, G. Ercilla^{1*}, C. Juan², N. López-González³, I. Cacho⁴, G. Frances⁵, D. Palomino³, Bárcenas³, M. Yenes⁶, J. Nespereira⁶, B. Ausín⁶, P. Mata⁷, D. Casas¹

Numerical simulation of sediment transport by thermohaline bottom currents

A. Ammendola^{1,2}, M. Rebesco², F. Roman¹, S. Salon², F. Falcini³

Controls of Upper Cretaceous to Upper Miocene, deep-sea, shelf and shallow-water carbonate sedimentation in W Cyprus

E. Balmer^{1*}, A. Robertson¹, D. Kroon¹, I. Raffi² and G. Coletti³

The early retreat of the Western Antarctic Ice Sheet from an ultra-high resolution Holocene paleoclimate record discovered in Edisto Inlet Fjord, northern Victoria Land, Antarctica

F. Battaglia^{1*}, L. Baradello², L. De Santis², M. Rebesco², F. Colleoni², E. Colizza³, V. Kovacevic², L. Ursella², M. Bensi², P. Falco⁴, N. Krauzig³, D. Accettella², E. Gordini², D. Morelli⁵, N. Corradi⁵, L. Langone¹

Microplastics across the Gulf of Cadiz continental slope: evidence for current velocity control

R. E. Brackenridge^{1*}, M. Schuettkus¹, A. Hartley¹, J. Travers¹

Sedimentology and Geochemistry of Carbonate Bearing-Argillites on the Southeastern Flank of Mount Cameroon (Likomba)

G. M. Chongwain¹, Christopher, C. M², Josepha Foba-Tendo³, A. F. Epanty², Tuutaleni Z. Angula¹

Characterization of channel-related contourites at Bight Fracture Zone (North Atlantic Ocean).

M. F. Copete^{1*}, I. Alejo¹, M. Pérez-Arlucea¹, P. Diz¹, F. Estrada², M. A. Nombela¹, A. Mena³ and G. Francés¹

Interaction between active tectonics and bottom-current processes: a unique example in the NW Moroccan Margin, Southern Gulf of Cadiz

D. Duarte^{1,2,3*}, V.H. Magalhães^{3,4}, F. J. Hernández-Molina², C. Roque^{4,5}, W. Menapace^{6,7}

Carbonate contourites and hemipelagites off the Bahamas

E. Ducassou¹, Ludivine Chabaud¹, Paul Moal-Darrigade¹, Kelly Fauquembergue¹, Lucie Hognon¹, Thierry Mulder¹, Vicent Hanquiez¹ and Jacques Giraudeau¹

Deep-water sedimentation controlled by interaction between bottom current and gravity flow: A case study of Rovuma Basin, East Africa

G. Fan¹, J. Wu¹, Y. Lu¹, H. Sun¹, X. Xu¹, F. Lyu¹, Q. Cao¹

Deep-water sedimentation in Ordos Basin, NW China

Juanping Feng^{1,2} Zhengjian Ouyang³ Wenhou Li⁴

Insights into fine-grained sedimentary facies at deep-sea: Identification, characterization and discrimination

Y. Gao^{1,2}, D. J. W. Piper^{2,3}, X. Xie¹, M. Su⁴

Reconstruction of intermediate and deep water circulation patterns in the Eastern Bransfield Basin (Antarctic Peninsula) from high-resolution acoustic data

M. García^{1*}, C. Escutia², F. Bohoyo³, F. J. Hernández-Molina^{2,4}, E. Llave³, L. Pérez⁵, A. Salabarnada², A. López-Quirós⁶, F. José Lobo², C. Morales²

Recent intensification of bottom water over the southern entrance sill of the Western Gap, NE Atlantic

T. Glazkova^{1*}, D. Frey², F. J. Hernández-Molina¹, E. Dorokhova², V. Krechik², L. Bashirova², L. Kuleshova², A. Kondrashov²

Discriminatory diagnostic criteria for contourites with respect to other deepwater sedimentary facies

F. J. Hernández-Molina^{1*}, F. J. Rodríguez-Tovar², H. Hüneke³, C. Cauceiro⁴, S. De Castro⁵, S. Rodrigues¹, T. Glazkova¹, M. Fonnesu⁶, J. T. Eggenhuisen⁷, J. R. Rotzien⁸, G. Postma⁷, K. Kleverlaan⁹

Late Miocene to Quaternary Contourites and Mixed Depositional Systems in the Gulf of Cadiz and West Portugal related to the Mediterranean - Atlantic exchange evolution: decoding bottom currents behaviour and oceanographic processes associated with gateways

F. J. Hernández-Molina^{1*}, Z. L. Ng¹, D. Duarte^{1,2}, E. Llave³, C. Roque^{4,5}, F. J. Sierro⁶, W. De Weger¹, S. de Castro⁷, S. Rodrigues¹, F. J. Rodríguez-Tovar⁸, L. M. Fernández-Salas⁹, M. García⁹, A. Arnaiz¹⁰, D. Roque¹¹, M. Bruno¹², R. F. Sánchez-Leal⁹

Facies variability and depositional architecture of bioclastic bottom-current deposits formed on a Devonian contourite terrace (Tafilalt Platform, Morocco)

H. Hüneke^{1*}, A. Gibb¹, P. Mehlhorn¹, L. Gibb¹, S. Aboussalam², T. Becker², A. El Hassani³, L. Baidder⁴

Contourite depositional systems on the South Shetland margin in Antarctica

S. Liu^{1*}, F. J. Hernández-Molina², H. Chen¹, M. Su¹, Z. Liang¹

Late Miocene to present-day sandy deposits in the Gulf of Cadiz associated to the Mediterranean Outflow Water

E. Llave^{1*}, B. Benjumea¹, F. J. Hernández-Molina², D. Duarte³, S. de Castro⁴, Z. L. Ng², F. J. Sierro⁵, J. F. Mediato¹, S. Ledesma⁶, H. Matias⁷, A. Ramos¹

Evolution of contourite (paleo)channels after the full opening of the Gibraltar Strait

E. Llave^{1*}, F. J. Hernández-Molina², M. García³, Z. L. Ng², D. Duarte^{2,4}, W. de Weger², S. de Castro², F. J. Sierro⁵

IODP Exp-403: The high-resolution paleoclimatic record of the western margin of Svalbard (Proposal IODP 985-Full2)

R.G. Lucchi^{1,2*}, S. Buenz², A. Plaza-Faverola², S. Vadakkepuliambatta³, J. Knies^{2,4}, M. Rebesco¹, K. St. John⁵ and the co-proponents of IODP 985Full2

Ichnofabric analysis as a tool for characterization and differentiation between calcareous contourites and calciturbidites

O. Miguez-Salas^{1,2*}, F. J. Rodríguez-Tovar²

Ryukyu Sand Sheet: a new contourite field in the Ryukyu Island Arc, northwestern Pacific Ocean

N. Nishida¹, T. Itaki², A. Amano², H. Katayama², T. Sato², D. Stow³, U. Nicholson³

The influence of deep marine circulation on gas-related seafloor morphologies over a salt tectonic domain: Case studies on the continental slope of Santos Basin, southern Brazilian margin.

R. B. Ramos^{1,2*}, M. M. de Mahiques^{1,3}, U. Schattner⁴, F. J. Lobo⁵, M. Maly¹

Key sedimentary facies and facies associations of mixed depositional systems on the Antarctic Peninsula Pacific margin: Implications for bottom-current and gravity-driven flow interactions

S. Rodrigues^{1*}, F. J. Hernández-Molina¹, C.-D. Hillenbrand², R. G. Lucchi^{3,4}, F. J. Rodríguez-Tovar⁵, M. Rebesco³, M. and R. D. Larter²

Ancient Jurassic to Eocene mixed depositional systems built offshore Nova Scotia: Implications for paleoceanography and sediment distribution

S. Rodrigues^{1*}, F. J. Hernández-Molina¹, M. E. Deptuck², D. C. Campbell³, K. Kendall²

Application of mercury intrusion porosimeter analysis on contourite facies: the role of bioturbation

F. J. Rodríguez-Tovar^{1*}, O. Miguez-Salas¹ and J. Dorador²

The role of micro-aggregates in organic carbon preservation in deep-marine sediments

Z. Smillie¹, D. Stow², J. Pan², T. Wagner², J.H. Macquaker³, J.S. Lien³, R.D. Jarvis³, W.V. Howard³

Holocene Contourites in the Arkona and Bornholm Basins, Baltic Sea

V. Spiess^{1*}, J. Pavlak¹, T. Schwenk¹

Paleoceanography and tectonics of the DITCH: the last 7 million years

L. Strachan^{1*}, L. Nothdurft², H. Bostock³, J. Whittaker⁴, T. Noble⁴, M. Seton⁵

Sedimentary process in a submarine canyon from Cape Darnley, East Antarctica under Antarctic Bottom Water inflow

K. Takehara¹, M. Ikehara^{1,2}, G.-I. Uramoto^{1,2}, N. Nishida³, T. Omori⁴, A. Amano⁵, Y. Suganuma^{6,7}, T. Itaki⁵

Characterization of muddy contourites around the Ryukyu Islands under the Kuroshio Current

Y. Tsukada¹, H. Kumatani¹, N. Nishida¹, T. Itaki², A. Amano², S. Sugisaki², K. Takehara³

Sediment drifts at the eastern Kerguelen Plateau: Archives of climate and circulation development

G. Uenzelmann-Neben^{1*}, M. Schneider¹, J. Gruetzner¹, T. Westerhold², E. Zirck²

The role of bottom currents in shaping the continental slope off NW Ireland, Rockall Basin, NE Atlantic Ocean

L. Wang^{1,2*}, T. Schwenk¹, A. Lefebvre², E. Miramontes^{1,2}

Formation and depositional records of the Mindoro channel in the Southern South China Sea

X. Xie^{1,2}, Y. Lu¹, Z. Lei³, H. Chen⁴

Plate convergence controls long-term full-depth circulation of the South China Sea

S. Yin^{1*}, F. J. Hernández-Molina², L. Lin³, M. He⁴, J. Gao¹, J. Li¹

The propagation of polydispersed particulate gravity currents into a stratified ambient in a channel of general cross-section

T. Zemach^{1*}

Deepwater interaction between gravity flow and bottom current in Zhongjian canyon, NW South China Sea: depositional architecture, evolution processes and main controlling factors

C. Zhang^{1*}, X. Xie¹, Y. Lu², T. Yang², S. Wang¹, S. Chu¹

The frequency and periodicity of preserved turbidites in IODP Site U1431 of the South China Sea Basin

X. Zhao^{1,2}, T. Jiang³, Z. Duan⁴, C. Gai¹ and Q. Liu¹

Friday 26th Discussion Workshops

Lyell Centre, Heriot-Watt University, Riccarton Campus, Edinburgh

Coach leaves Edinburgh City Centre at 09:15 for those who need transport.

Alternatively, make your own way to the campus: Lothian Buses 25, 34 and 35 have a very regular service to the campus.

10:00 **Arrival and coffee**, Lyell Centre reception are outside Seminar Rooms.

10:30-13:00 **Discussion Workshops**. *Note that these are still flexible and open to change according to delegates wishes. Workshops 1 and 2 will most likely be merged.* They will take place in Seminar Rooms 1 and 2 of the Lyell Centre, and in the Core Viewing area, George Bruce Building, for the core workshop.

1. **Deep Ocean Drilling: An IODP Workshop**. Facilitated by Uisdean Nicholson
2. **Contourites and ocean hazards: slope instability and tsunami genesis**. Facilitated by Dorrik Stow and Naohisa Nishida. Sponsored by JSPS (Japan Society for the Promotion of Science)
3. **Deepwater Sediments and Core Workshop**. Facilitated by Zeinab Smillie. Cores supplied by BOSCORF (British Ocean Sediment Core Research Facility)

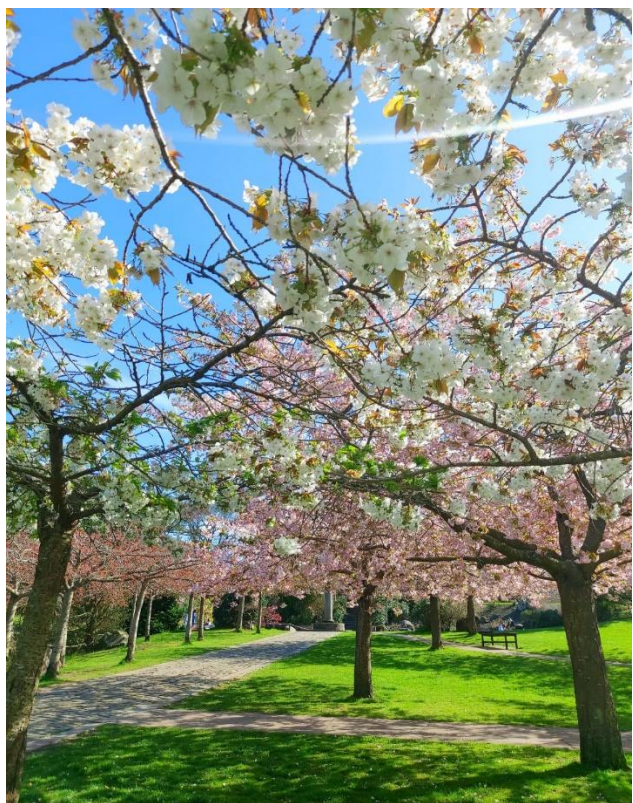
13:00-14:30 **Lunch**. Available at various cafeterias on campus.

14:30-15:30 **Mini-discussion groups** as required. Lyell Centre – seminar rooms and/or top floor. Currently projected mini-workshop includes:

1. **Modelling, flume experiments and seafloor observations**. Facilitated by Michele Rebesco and Elda Miramontes.
2. **Hybrid systems: contourites, turbidites and hemipelagites**.

15:30 **Closing drinks**, HOWFF lounge area, top floor Lyell Centre

Edinburgh Information



Photos and cover photos by Claire Ashford

USEFUL CONTACTS

Police Non-Emergency	101
NHS Non-Emergency	111
Emergency	999
Mobile Phone Emergency	112
Tourist Information	+44131 473 3820
'Airlink' Airport Bus	+44131 555 6363
City Cabs	+44131 297 1262
Central Taxis	+44131 229 2468

TRANSPORTATION



The 'Transport for Edinburgh' travel app from Lothian has everything you need to get around Edinburgh with Lothian Buses and Trams. It will show the stops near you and bus live times.



In the 'm-ticket' app you can pre-purchase Adult or Family tickets (£4.00 minimum) to use on Edinburgh buses and trams. Just activate your ticket as you board the bus and show your phone screen to the driver.



From the Airport to City

When arriving at Edinburgh Airport, there are a variety of options to reach the city centre. We recommend checking timetables and routes in advance to determine the best option for your needs.

The **tram** service (<https://edinburghtrams.com/>) is a very convenient and comfortable way to travel to the city centre, which runs every 7 minutes and takes about 35 minutes.



Alternatively, several **buses** also operate from the airport to different parts of the city, with varying journey times and routes (<https://www.lothianbuses.com/our-services/airport-buses/>).

	100	24/7 Express linking you to the Edinburgh city centre
	200	Linking you to Ocean Terminal via North Edinburgh
	300	Linking you to Cameron Toll via West Edinburgh
	400	Linking you to Fort Kinnaird via South Edinburgh

Getting to the Royal Society of Edinburgh (Main Venue)

The Royal Society is situated in the heart of Edinburgh's city centre, at 22-26 George Street. There are several convenient transportation options available for conference attendees to access the venue. Multiple bus routes and the tram line serve the area, stopping at Princes Street, 5 minute walk from the conference venue.

Getting to Heriot-Watt University

Several Lothian Bus routes (**25, 34, 35, 45**) service the university campus to and from the city centre every 10 min during the day and every 15 min after 8pm. The journey takes about 30-40 minutes.

RESTAURANTS

Many If you are looking for a place to eat in Edinburgh, you're in luck – the city offers a wealth of dining options to suit every taste and budget. If you're not sure where to start, we recommend checking out some of the popular dining areas, such as the New Town (close to the RSE venue), the West End (including Lothian Road, Dalry Road and the Haymarket area) and the Old Town (including the Grassmarket, Royal Mile and Victoria Street) which offer a wide variety of restaurants, cafes, and bars to choose from.

It is always a good idea to book in advance as Edinburgh is very busy at this time of year. Here are some suggestions from the organisers' favourites to get you started. There are many others!

New Town (near the Royal Society)

Amarone, George Street, Italian
The Dome, George Street
Le Monde, George Street, wide range
Café Andaluz, George Street, Spanish
Contini, George Street, Italian
Dishoom, St Andrews Square, Indian
Wagamama, St Andrews Square
Gaucho, St Andrews Square, steaks
Yes Sushi, Hannover Street
Bar Napoli, Hannover Street
Elements, Rose Street
Pizza Posto, Nicolson Street
Pizzeria 1926, Dalry Road

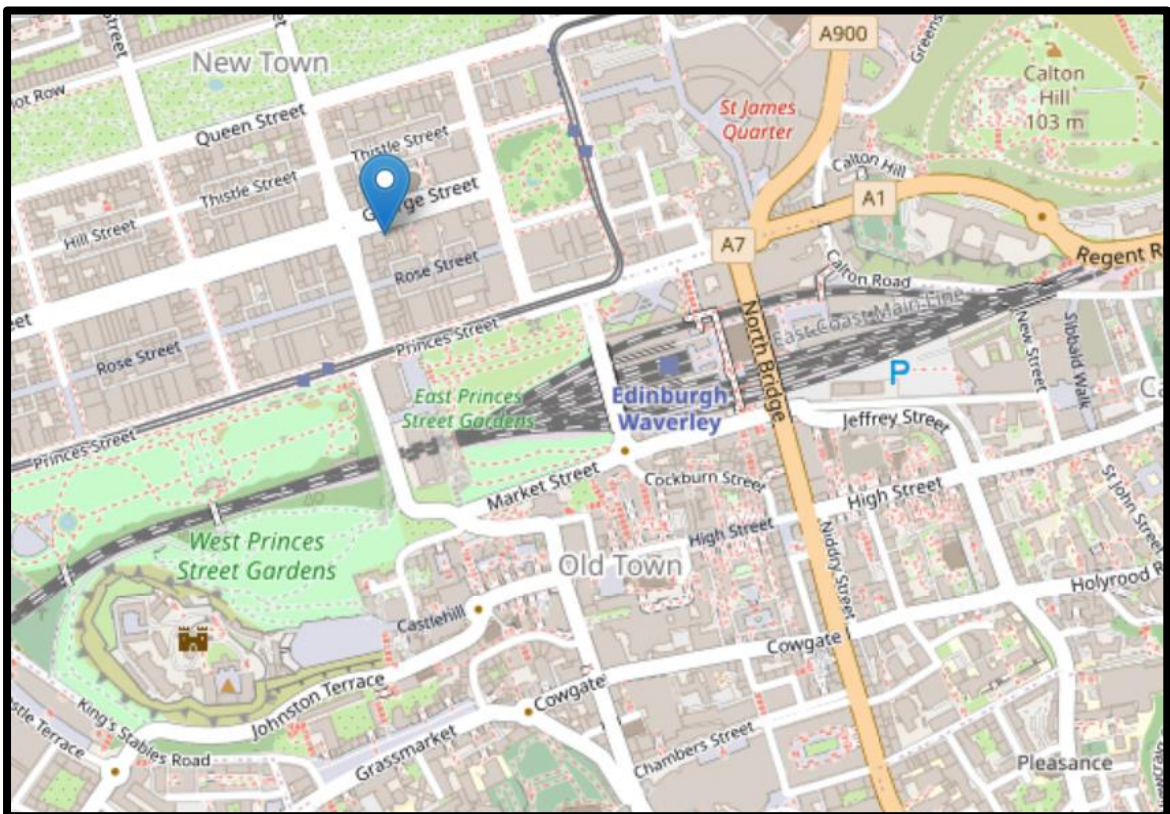
West End and Lothian Road

Red Squirrel, Lothian Road, burgers and beer
The hanging Bat, Lothian Road, pub food and craft beer
Paradise Palms, Lothian Road, vegetarian and vegan

Old Town

Howies, Victoria Street, Scottish seasonal food
Howies, Waterloo Place, Scottish seasonal food
Scotts Kitchen, Victoria Street, Scottish food
Maison Bleu, Victoria Street
Cannonball, Royal Mile
The Witchery, Royal Mile
Amber Rest, Royal Mile
The Outside, George IV Bridge
Made in Italy, Grassmarket
Petit Paris, Grassmarket

The Royal Society of Edinburgh



ATTRACTIONS

- 1 James' Grotto & Well
- 2 World of Wallace
- 3 Scottish National Portrait Gallery
- 4 Scottish National Gallery of Modern Art
- 5 Royal Botanic Garden Edinburgh
- 6 Gladstone's Land
- 7 The Georgian House
- 8 The Scotch Whisky Experience
- 9 City of Edinburgh Council Museums Galleries & Memorials
- 10 Museum on the Mound
- 11 The Edinburgh Dungeon
- 12 The Real Mary King's Close
- 13 St Giles Cathedral
- 14 Scottish Storyline Centre
- 15 Haunted Graveyard Tour
- 16 Palace of Holyroodhouse
- 17 Dynamic Earth
- 18 Surgeons' Hall Museums
- 19 Greyfriars Kirk
- 20 Edinburgh Zoo
- 21 The Royal Yacht Britannia

Tours

- 25 Mercat Tours
- 26 Highland Experience Tours
- 27 Trife Tours Scotland
- 28 walkaboutscotland.com
- 29 Edinburgh Bus Tours
- 30 (Royal Edinburgh Trolley)

Specialty Shops

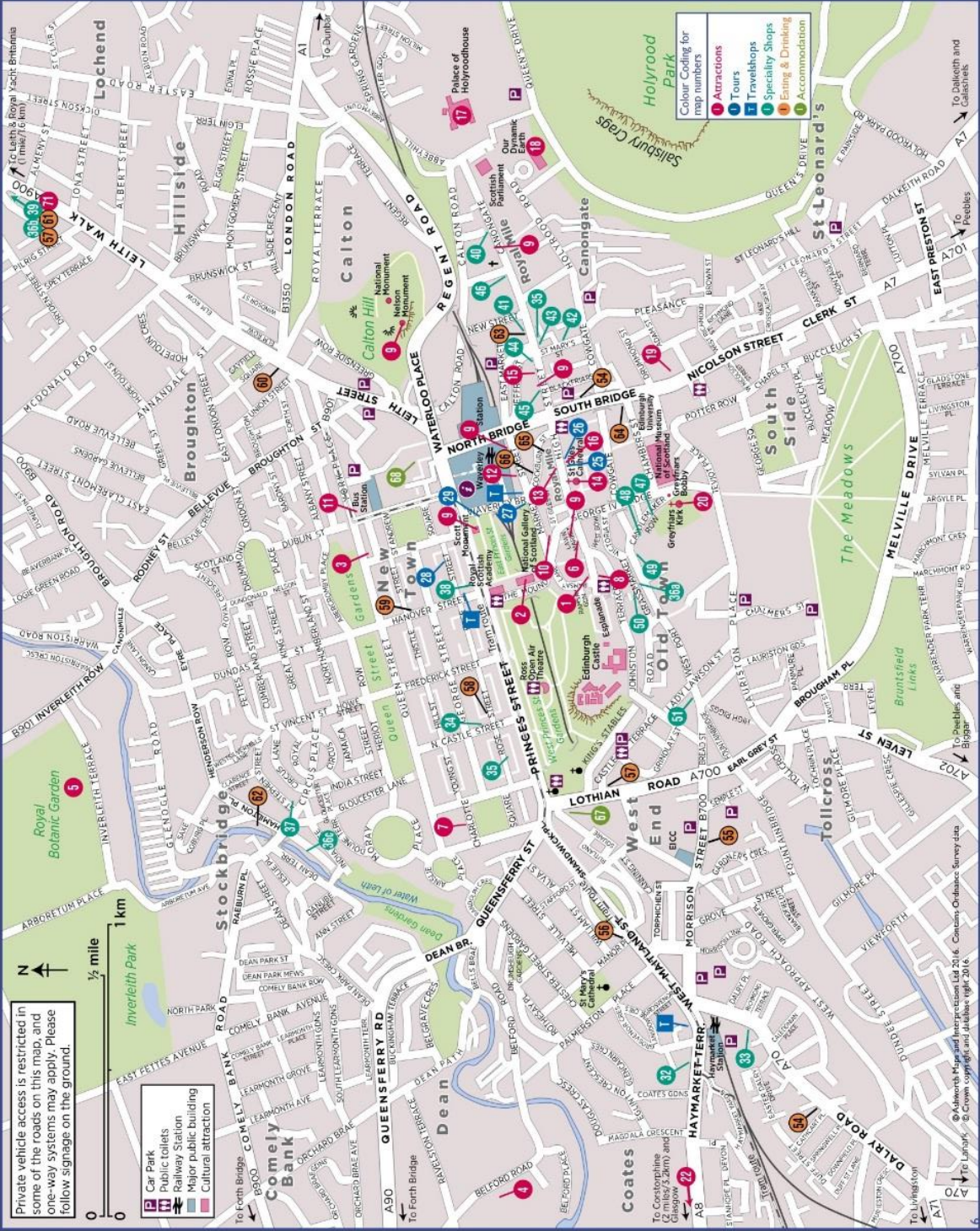
- 32 Bagpipes Galore
- 33 Edinburgh Golf Centre
- 34 The Treasure Trove
- 35 Robert Graham
- 36 Grassmarket Market
- 37 Leith Market
- 38 Stoddart's Market
- 39 Stella Fleet
- 40 Romantics & Paterson
- 41 Vintage Fringe Shopping
- 42 Vintage Books
- 43 Nisios Scott
- 44 Cranston & Crowdie
- 45 Kiberry Bagpipes
- 46 Ragamuffin
- 47 Highland Gems
- 48 The Tapit Hen
- 49 Hamilton & Young
- 50 Joyce Forsyth
- 51 People Arts & Picture Framing
- 52 Wood's Fossils
- 53 Bill Baber
- 54 Cabinet Antiques & Curios

Eating & Drinking

- 54 Kebabish
- 55 Brasserie Les Armes
- 56 The Indian Cavalry Club
- 57 Wagamama
- 58 Indian Lounge
- 59 Yes Surti
- 60 Boba's Spice
- 61 Boba's
- 62 The Restaurant
- 63 Wedgwood - The Restaurant
- 64 The Jazz Bar
- 65 Arcade Bar
- 66 Gurkha Cafe & Restaurant

Accommodation

- 67 The Caltonian
- 68 Highgates

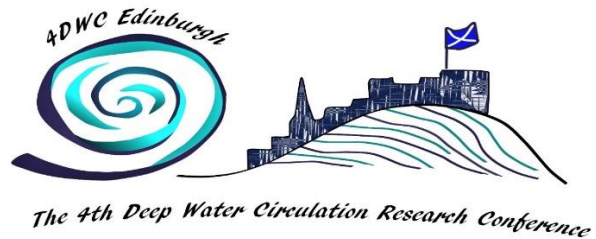


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JSPS



Contourites and ocean hazards: slope instability and tsunami genesis

June 2nd 2023

The Lyell Centre, Heriot Watt University

A special seminar sponsored by the Japan Society for the Promotion of Science (JSPS) will be held in association with the 4th Deep Water Circulation Research Conference (4DWC). Topics presented at the 4DWC at the Royal Society of Edinburgh and Heriot Watt University (24-26th May 2023) will be reprised for discussion at this seminar. The seminar will be held both in-person and online. We look to promote scientific advance in this important area of environmental science and to foster Japan-UK research collaboration.

Facilitated by Professor Dorrik Stow (Heriot Watt, Edinburgh) and Dr Naohisa Nishida (Gakugei Tokyo University, Japan)

For enrolment, in-person and online participation, and further information, please contact: d.stow@hw.ac.uk or nishidan@u-gakugei.ac.jp

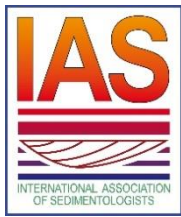


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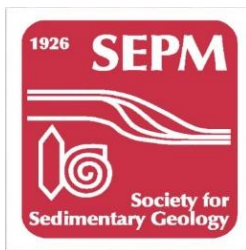
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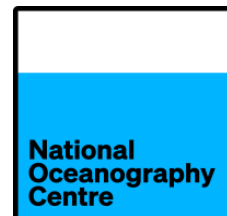
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