

## JAMES CROLL MEDAL

*The James Croll Medal is the highest award of the QRA and is named in honour of James Croll (1821-1890). Croll is most closely associated with fundamental work on the astronomical theory of the ice ages, but he also made seminal contributions on the glacial geology of Scotland, on the mechanisms that drive ocean circulation and the impact of that circulation on recent climate, on tidal theory and the rotation of the Earth. These are all major issues that occupy Quaternary scientists to this day. Croll was effectively self-taught. His work and example demonstrate that any individuals from all backgrounds can rise to national eminence and generate science of lasting and major international impact, and that it is not who you are or where you come from but what you do that is important. These are the qualities that the QRA seeks to celebrate in the award of the James Croll Medal.*

*The Medal is therefore normally awarded to a member of the QRA who has not only made an outstanding contribution to the field of Quaternary science, but whose work has also had a significant international impact.*

### Professor Mary Edwards



The QRA is pleased to announce that this year's recipient of the James Croll Medal, the senior medal of the QRA, is Professor Mary Edwards.

Cultural landscapes and the environmental history of the North have remained two key themes in Mary's research. Her early work on historical changes in Atlantic "rainforest" nature reserves in North Wales anticipated the now urgent topic of biodiversity loss and human impact. She is probably best known for research on northern regions: Beringia (NE Siberia, Alaska, NW Canada) and Norway, areas now at the forefront of climate-change impacts. Much of this work has involved international collaborations with scientists from Russia, the USA, and several European countries. Her work in Beringia over four decades ranges from palynological studies to landscape dynamics and palaeohydrology. With colleagues she developed regional vegetation histories, summarizing them for use in vegetation modelling and climate-model evaluations. An influential study of thaw-lake evolution and methane production led to a range of further studies on lakes (including an ongoing project). Mary and colleagues pioneered the development of fire histories for the Alaskan boreal forest and lake-level records that demonstrate major late-Quaternary moisture fluctuations.

In the early 1990s, thanks to *glasnost*, Mary was fortunate to participate in some of the earliest international exchanges with Russian (then Soviet) scientists, investigating the *yedoma* landscapes of NE Siberia that preserve late-Quaternary palaeo-environmental records and megafaunal remains. Subsequently, she co-hosted the first ever—and wonderfully amicable—expedition of Soviet scientists to Alaska. She also collaborated with colleagues studying relict mountain steppe in the contemporary landscapes of Russia and Alaska-Yukon, which led to further investigation of microclimatic control over variation in plant communities in Alaska and Norway; this phenomenon is now understood to be an important source of resilience for arctic vegetation in the face of climate change.

Later, Mary joined scientists from across Europe in developing a comprehensive survey of past circumpolar vegetation dynamics using the new

approach of ancient sedimentary DNA (*sedaDNA*). The project stimulated further work across the palaeo research community; this is one of the fastest growing areas of Quaternary palaeoecology. Several studies followed with colleagues in Norway to examine in more detail how *sedaDNA* patterns in lakes and soils reflect vegetation.

In recent years, Mary has returned several times to Russia, setting up the DIMA network along with Russian, American and UK colleagues. DIMA encourages cooperation and exchange of ideas among palaeoecologists in Russian science institutions of Siberia, whose work covers a vast area now strongly affected by climate change, but who have little support for their work. In 2021 its membership included over fifty Russian scientists plus UK researchers. Sadly, DIMA is now on hold until the world returns to its senses.

More broadly, Mary has been active in the northern science community, serving variously on the AMQUA Council, steering committees for arctic science policy (NSF PARCS – paleo-arctic sciences; and the UKAAP – Arctic Antarctic Partnership), and the terrestrial working group of IASC (International Arctic Science Council). She served for some years as the Director of the Alaska Quaternary Center. A highlight of her research has been the enthusiastic involvement of students (undergraduate and postgraduate) in work in Alaska-Yukon and Russia.

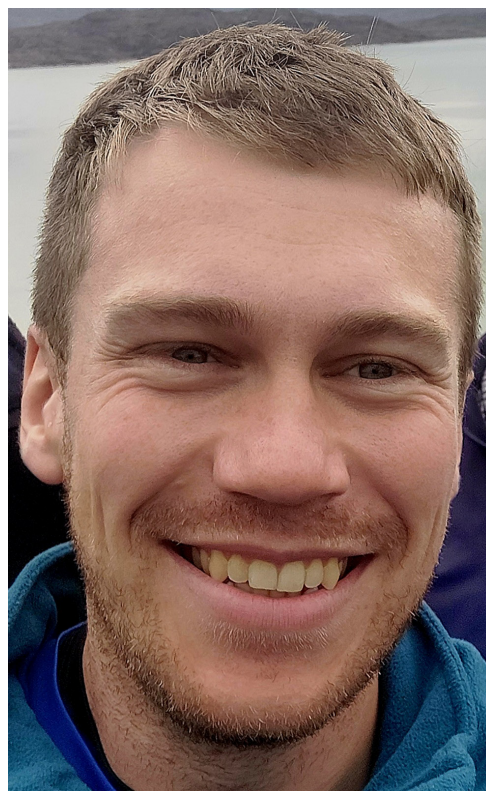
## LEWIS PENNY MEDALS

*This medal, which is named after Lewis Penny, a Quaternary geologist and founder member of the QRA, is awarded to a young or new researcher who has made a significant contribution to any area of Quaternary Research.*

This year we are awarding two Lewis Penny Medals, to the worthy recipients Dr Jeremy Ely and Dr Dulce Oliveira.

### Dr. Jeremy Ely

The map of Jeremy's academic career is rather simple. He studied for an undergraduate degree in Physical Geography at the University of Sheffield. This was followed by a Ph.D., on the links (or as he found out the lack of links) between subglacial bedforms and ice surface structures, at the University of Sheffield. He was then employed as a postdoctoral researcher on the BRITICE-CHRONO project, where he undertook



ice sheet modelling and empirical reconstruction of the last British-Irish Ice Sheet, at the University of Sheffield. Surprisingly, he stayed at the University of Sheffield during his NERC independent research fellowship, which focussed on linking numerical ice flow models and empirical data of palaeo-ice sheets. In 2023, Jeremy was appointed as a lecturer, and is now a senior lecturer, at the University of Sheffield. Those of you concerned at this point about Jeremy limiting his horizons to South Yorkshire, will be relieved to know he has occasionally been allowed to leave Sheffield, undertaking fieldwork in Poland, Germany, Sweden, Greenland, Bolivia and Chile.

Jeremy has contributed to a wide range of topics, using multiple methods, across Quaternary Science and glaciology. He spins this lack of focus into a loose aim – to make palaeo observations useful for predicting the behaviour of contemporary ice masses in our warming world. Jeremy brings together techniques such as remote sensing, numerical modelling and fieldwork to grasp towards this goal. Highlights of his work, according to a quick Google scholar search of himself, include the discovery of widespread meltwater on the surface of the Antarctic Ice Sheet, an improved understanding of subglacial bedform formation, contributing to a reconstruction of the last British-Irish Ice Sheet and better methods for integrating numerical ice flow models with palaeo-data. He has contributed to over 45 articles in journals such as *Nature*, *Nature Communications*, *Geology*, and *JQS*.



Jeremy has been awarded over £3,000,000 of funding from NERC as lead investigator and has contributed to numerous other funded research projects (including PALGLAC, an ongoing ERC funded advanced grant). He is currently lead investigator of a NERC highlight project (~£2.5 million) to understand glacier and snow change across the Andes since the Little Ice Age, and the impact this has had upon water resources for the surrounding population. Throughout his career, Jeremy has been privileged to work with a great team of Ph.D. students and postdoctoral researchers, whom he often has trouble keeping up with, especially before morning coffee.

Jeremy would like to thank all his friends and colleagues, too numerous to list individually, in the QRA for their support and for the fun memories (or lack of) and discussions at conferences and field meetings. He would like to especially thank Prof. Chris Clark who has always been very generous with his time, has been a great mentor and has taught him much regarding sheep farming.

#### Dr Dulce Oliveira



Dulce Oliveira graduated in Marine Biology, has an MSc in Marine Sciences, and a Ph.D. in

Marine Sedimentology and Paleoclimate from Bordeaux University, France (2017). Her research has contributed to the fields of palaeoecology and palaeoclimate, with a special focus on the vegetation response to past climate change in vulnerable regions. This focus has been developed through specialization in pollen analysis from marine sediments, which provides the unique opportunity to directly compare pollen-based vegetation and terrestrial climate with marine environmental change in the same stratigraphic level. This approach leads to a better understanding of land-atmosphere-ocean systems, bypassing timescale and correlation uncertainties. During her scientific career she has investigated SW European vegetation and climate variability during past interglacials of the Quaternary, through the analysis of IODP Site U1385, the so-called *Shackleton Site*. In particular, her research has focused on two super-interglacials (globally *superwarm* conditions): Marine Isotopic Stage (MIS) 31 and MIS 11. This work has remarkably demonstrated that a) both interglacials were not particularly warm in the Mediterranean region, and b) the diverse expression of abrupt cooling events on Mediterranean ecosystems is related to different baseline climate states (Oliveira *et al.*, 2016, 2017). Moreover, it was examined for the first time the forcings modulating the expression of the Holocene and its orbital analogues, MIS 11c and 19c, over SW Iberia using a data-model comparison (Oliveira *et al.*, 2018). This study showed that these interglacials cannot be considered as Holocene analogues in Iberia and demonstrated that Mediterranean tree cover was primarily forced by orbital parameters, whereas CO<sub>2</sub> played a minor role. MIS 13, considered as one of the coolest and most glaciated interglacials of the past 800 kyr, was also investigated by combining terrestrial-marine profiles with model experiments. This contribution revealed that MIS 13 stands out as a prolonged interglacial marked by high levels of humidity in SW Iberia and highlighted the importance of combining insolation and ice-sheet forcing to explain its regional imprint (Oliveira *et al.*, 2020).

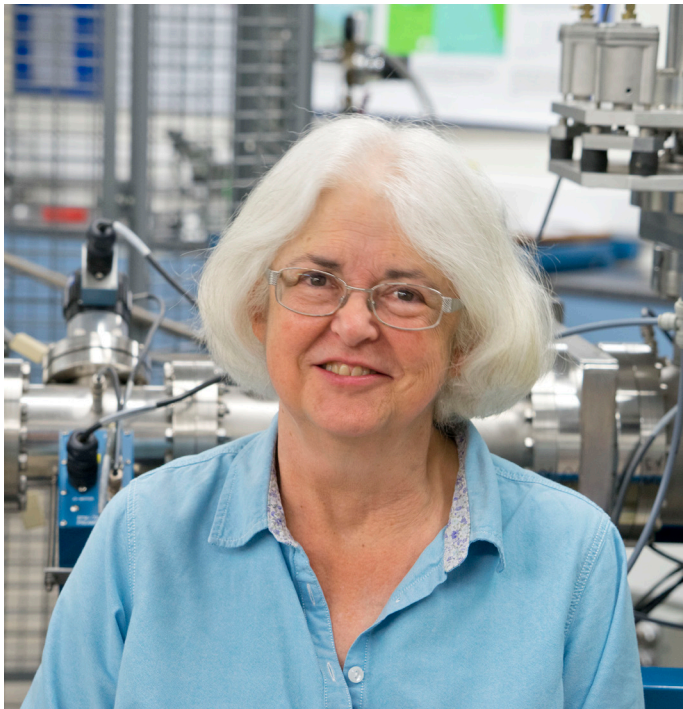
In 2020, Dulce started a junior researcher contract at CCMAR-Algarve Centre of Marine Sciences and IPMA-Portuguese Institute for Sea and Atmosphere, PT, to investigate past Indian vegetation and monsoon response to climate variability. To complement this contract, in 2021 she was awarded a national project to focus on key glacial-interglacial cycles of the Quaternary. Author/co-author of 18 publications, her work has awarded her 5 prizes, including the L'Oréal Medal of Honour for Women in Science and 15 grants

to participate in scientific meetings. Participation in 13 research projects and a member of the international pollen working groups IODP EXP 339, 353 and 397, provided her the opportunity to establish a fruitful network of international collaborations. Conscientious of the importance of dissemination and outreach, Dulce has been very active in this domain, participating in national and international scientific meetings with 101 presentations (44 as 1<sup>st</sup> author). She has also been involved in teaching, supervising students, various outreach initiatives for 1<sup>st</sup>-grade students, and she is co-responsible for the scientific Paleo-Forums organization at IPMA.

## HONORARY MEMBERS

*Every year we nominate individuals for Honorary Membership of the Quaternary Research Association in recognition of significant, long-standing contributions to the QRA and to Quaternary science more widely. This year I am delighted to say that we have awarded Honorary Membership of the QRA to Paula Reimer and Danny McCarroll.*

### Professor Paula Reimer



Paula J. Reimer received her Ph.D. in Geological Sciences at the University of Washington in 1998 working under the supervision of Professor Minze Stuiver in the Quaternary Isotope Lab. She then took up a postdoctoral research fellowship in School of Archaeology and Palaeoecology at Queen's University of Belfast, Northern Ireland, followed by a three-year position at the Center for Accelerator

Mass Spectrometry at Lawrence Livermore National Labs. She established the international radiocarbon calibration working group (IntCal) which she chaired from 2002-2020. From 2004-2022, Paula was the Director of the <sup>14</sup>CHRONO Centre for Climate, the Environment, and Chronology at Queen's University Belfast and established the <sup>14</sup>C AMS facility there. Although now retired she continues to be involved with the IntCal Working Group and with research in radiocarbon reservoir offsets and carbon storage in sediments.

### Professor Danny McCarroll, FLSW



Danny McCarroll was born in the steel-works town of Wishaw, near Motherwell, but moved to the car-factory city of Coventry at the age of 2. His father was a factory worker, his mother a barmaid. In 1979 he started his undergraduate studies in Geography at Sheffield University, specialising in geomorphology. Between 1983 and 1986 he undertook a Ph.D. at the University of Wales, based in Swansea, working on Little Ice Age glacier fluctuations in the Jotunheimen mountains of Norway, supervised by Rick Shakesby and John Matthews. During this time he discovered many uses for the Schmidt hammer! Between 1987 and 1989 he was a post-doc in Earth Science at Cardiff University mapping drift deposits on the Llyn Peninsula of North Wales. He became embroiled in debunking the 'glacimarine' model of deposition for the Irish Sea drift. This required a critique of 'amino acid dating', which ruffled a few feathers. Between 1989 and 1990 he spent a year as a teaching assistant in Geography at Southampton University. Between 1990 and 2021 he was a member of the Geography Department at Swansea University. His research

interests migrated from mapping trimlines with Colin Ballantyne to exploring the potential of using stable isotopes in tree rings to reconstruct the climate of the past. Most of his tree ring research was funded by the EU, including the big ‘Millennium’ project, with 40 partners and a budget of 12 million, which he coordinated. Over the course of his career Danny has published more than 130 research papers. In retirement he intends to keep rock climbing until he drops dead and maybe do a bit of tree ring isotope research when he can fit it in (his words!).

**Professor Jane Hart (QRA President)**  
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