



**55th Irish Geological Research Meeting
&
Lithosphere Workshop**

**University College Cork
17th - 19th February, 2012**

Programme

Friday 17th February 2012

Lithosphere Workshop

- 1300 **Registration and mingling in the Cavanagh Pharmacy Building**
- 1330 **Welcome and Symposium opening by Professor Paul Giller, Registrar and Vice President for Academic Affairs, UCC - LG52, Cavanagh Pharmacy Building**
- 1345 - 1415 **The Evolution of the Continental Crust: The Zircon Archive**
C.J. Hawkesworth, University of St Andrews
- 1415 - 1445 **A lower crustal xenolith perspective on the Caledonides of Ireland and Britain**
J.S. Daly, University College Dublin
- 1445 - 1515 **Magma to tephra to time**
M.A. Menzies, Royal Holloway University of London
- 1515 - 1545 **Tea/Coffee**
- 1545 - 1615 **Magma, Mangoes and Malibus, Arc Sources and differentiation processes in the Caribbean**
J.P. Davidson, University of Durham
- 1615 - 1645 **Illuminating lithospheric structures using electromagnetic waves and correlations with other geophysical, geological and petrological data**
A.G. Jones, Dublin Institute for Advanced Studies
- 1645 - 1715 **Present day Arctic seafloor hydrate dissociation**
I.C. Wright, University of Southampton, NOC
- 17.15-17.30 **Concluding Remarks**

**55th IGRM
IGA/CGA Keynote Address**

- 1800 **IGRM Registration in the Boole Basement**

- 1850 **Welcome and IGRM opening speech – Dr Andy Wheeler, Head of Geology and Vice Head of the School of Biological, Earth and Environmental Sciences, UCC and Laura Smith, President of IGA**
- 1900 - 2000 **IGA-CGA keynote speaker, Boole Lecture Theatre 2**
The origin of animal ecosystems: integrating the Cambrian Explosion and Ordovician Radiation
Professor Dave Harper, Durham University
- 2015 **Icebreaker reception in Áras na Mac Léinn Student Centre**

Saturday 18th February
55th IGRM

- 0830 **Registration in the Boole Basement**
- 0850 **Welcome and opening of IGRM by Professor Patrick Fitzpatrick, Head of College of Science, Engineering and Food Science, UCC – Boole Lecture Theatre 2**
- 0900 - 0915 **The formation of breached relay zone geometries from splay propagation**
J. Conneally, C. Childs and J. Walsh
- 0915 - 0930 **Young faults in old rocks: a salutary lesson**
P. Haughton, P. Shannon, C. Pierce, A. Pulham and O. Martinsen
- 0930 - 0945 **Strain analysis in areas of low-grade deformation**
D. Mc Carthy, P. Meere and K. Mulchrone
- 0945 - 1000 **Larvikites of the Permian Oslo Province: A Fresh Appraisal**
I.G. Meighan
- 1000 - 1015 **U-Pb ion-microprobe zircon geochronology of a new lower crustal xenolith locality from the Iapetus Suture Zone in Ireland**
H.B. O'Rourke, J.S. Daly and M.J. Whitehouse
- 1015 - 1030 **Micro-magnets measuring macro movements - The intrusion and subsequent deformation of the Carna Granite**
W. McCarthy, R.J. Reavy, C.T. Stevenson, M.S. Petronis, M. Feely and Q. Crowley
- 1030 - 1100 **Tea/Coffee and Posters**

- 1100 - 1115 **New fossil discoveries in the Trabane Member of the Bulls Head Formation, Lower Old Red Sandstone, Dingle Peninsula: age and palaeoenvironmental implications**
K.T. Higgs, J.D. Boyd and B.P J. Williams
- 1115 - 1130 **Microbial life in fluid inclusions: evidence from Permian to present day evaporite deposits**
A. Costanzo, E. Mc Nulty, M. Feely, T. Lowenstein, E.P. Lynch, R. Dominici and J.C. Melgarejo
- 1130 - 1145 **Pleistocene to Holocene stratigraphy of Azokh Cave, Lesser Caucasus**
J. Murray, E.P. Lynch, P. Domínguez-Alonso, M. Barham, Y. Fernández-Jalvo, P. Andrews, L. Yepiskoposyan, F. Baker and T. King
- 1145 - 1200 **A method of modelling vertebrate skeletal taphonomy using the marine reptile *Serpianosaurus* (Reptilia; Sauropterygia)**
S. Beardmore, P. Orr and H. Furrer
- 1200 - 1215 **Rapid response of Irish glacial climate to temperature variability recorded in Greenland Ice Cores – evidence from U-series dated speleothems**
A. Fankhauser, F. McDermott, D. Fleitmann and D.L. Hoffmann
- 1215 - 1230 **Seasonal variability in soil CO₂ production; a case study from Ballynamindra Cave, Co. Waterford**
D. Rudzka and F. McDermott
- 1230 - 1345 **Lunch**
- 1345 - 1400 **The use of speleothems to reconstruct the North Atlantic Oscillation (NAO): a case study from N. Spain**
L. Comas-Bru and F. McDermott
- 1400 - 1415 **Smoking chimneys: the newly discovered Moytirra hydrothermal vent, mid-Atlantic Ridge**
A. Wheeler, B. Murton, J. Copley, B. Dorschel, J. Benzie, D. Green, J. Carlsson, P. Collins, M. Coughlan, A. Lim, A. Antoniacomi, M. Judge, V. Nye and K. Morris
- 1415 - 1430 **Impact of sediment disturbance on the Western Mud Belt of the Irish Sea as a palaeo-archive and its engineering significance**
M. Coughlan, A. Wheeler, B. Dorschel and T. Moerz
- 1430 - 1445 **The bedrock geology of Dublin Bay**
M. McDonnell, D. Chew and G. Sevastopulo
- 1445 - 1500 **Towards sediment mobility modelling of maërl: experimental work to determine the critical bed shear stress of maërl beds in Galway Bay**
S. Joshi, G. Duffy and M. White

- 1500 - 1530 **Tea/Coffee and Posters**
- 1530 - 1545 **Could Early Cretaceous lignites have helped to source the giant Kinsale Head gas field, offshore Ireland?**
J. O'Sullivan, D. Brennan, S. Jones, R. Hardy and D. Chew
- 1545 - 1600 **Modelling sandstone connectivity in deep-water lobes**
L. Zhang, T. Manzcocchi and P. Haughton
- 1600 - 1615 **New constraints on the development of the Ross deep-water system from behind-outcrop boreholes in the Clare Basin**
C. Pierce, P. Haughton, P. Shannon, A. Pulham, O. Martinsen, I. Kane, F. Hadler-Jacobsen and T. Elliott
- 1615 - 1630 **Late Holocene sedimentary provenance of the West Bengal Sundarbans: preliminary results and interpretations**
R. Flood, J.D. Orford and K.D. Bennett
- 1630 - 1645 **On the trail of a blast from the past in NW Scotland**
M. Simms
- 1700 - 1800 **Shell sponsored keynote address, Boole Lecture Theatre 2 introduced by Professor John O'Halloran, Head of School of Biological, Earth and Environmental Sciences, UCC**
- On the link between Neogene evolution of climates and hominids**
Professor Dick Kroon, Regius Professor of Geology, University of Edinburgh
- 1815 - 1915 **Posters/Wine in Boole 5**
- 1930 **Conference Dinner in Áras na Mac Léinn Student Centre**

Sunday 19th February
55th IGRM

- 0830 **Registration in the Boole Basement (Cont.)**
- 0900 - 0915 **IRETHERM: Research and exploration challenges in assessing Ireland's deep Low-Enthalpy Geothermal Energy Potential**
M.R. Muller, A.G. Jones, J.S. Daly, J. Fullea, A. Allen, R. Goodman, N.H. Hunter Williams, M. Lee, D. Reay, M. Feely, P. Hanly and R. Pasquali
- 0915 - 0930 **Development and application of a tool for extraction of sand dune morphometric parameters from digital terrain models: observations of**

characteristic distribution patterns of morphometric patterns within a large bedform field

G. Duffy

- 0930 - 0945 **Heterogeneity in microseismic noise generation, West of Ireland**
D. Craig, C.J. Bean, M. M. Möllhoff, A.K. Braiden, K. Lambkin, C. Creamer, M. Campillo and M. White
- 0945 - 1000 **Towards a quantification of ocean wave heights from land-based seismic data**
S.E. Donne, C.J. Bean, M. Möllhoff, A.K. Braiden, K. Lambkin, C. Creamer, M. Campillo and M. White
- 1000 - 1015 **Comparing the source mechanisms of long period (LP) volcano-seismic events recorded by temporary broadband seismic networks in 2009 and 2011 at Turrialba volcano, Costa Rica**
T. Eyre, C.J. Bean, L. De Barros, G.S. O'Brien, F. Martini, M.M. Mora, J.F. Pacheco and G.J. Soto
- 1015 - 1030 **Investigating the source mechanisms of a family of long period (LP) events recorded on Piton de la Fournaise, La Réunion**
M. Zecevic, L. De Barros, C.J. Bean and F. Brenguier
- 1030 - 1100 **Tea/Coffee and Posters**
- 1100 - 1115 **Tellus Border Project – project update and research opportunities**
R.P. Scanlon, M. T. Cowan, M. Glennon, K. V. Knights, M. Desissa, V. Gallagher, J. Hodgson, S. Carey and C. McGinn
- 1115 - 1130 **The structure and emplacement of the Newry Igneous complex from Tellus geophysical data and AMS**
P. Anderson, J. Inman, D. Condon, Q. Crowley, Colm Hurley, I. Meighan, R. Ellam, J. Reavy, C. Stevenson and M. Cooper
- 1130 - 1145 **Unravelling glacial sediment provenance in Northern Ireland using soil geochemistry**
M. Dempster, P. Dunlop, A. Scheib and M. Cooper
- 1145 - 1200 **Soil carbon and peat depth assessment using airborne geophysical data**
A. Keaney, J. McKinley and A. Ruffell
- 1200 - 1215 **Remote sensing and GIS for landuse/landcover classification and water quality in the Northern Ireland**
R. Amer, U. Ofterdinger, A. Ruffell and A. Donald
- 1215 - 1230 **Investigating the use of tellus data to improve peat depth models for Northern Ireland**
M. Robinson, J. McKinley, A. Ruffell and M. Young

- 1230 - 1345 **Lunch**
- 1345 - 1400 **Long term slip deficit modelling for the Sunda Megathrust beneath the Mentawai Islands, Sumatra**
J. McCloskey, S. Murphy, S. Nalbant, N. Simao and T. Lindsay
- 1400 - 1415 **Statistical quantification of time-dependence in the Coulomb model of earthquake triggering**
M. Nic Bhloscaidh, J. McCloskey, S.S. Nalbant and C.J. Bean
- 1415 - 1430 **The strain rate on the Sunda Megathrust, West Sumatra**
N. Simão, J. McCloskey, S. Nalbant, A. Lindsay and S. Murphy
- 1430 - 1445 **Simulating seismicity induced by fluid injection**
S. Murphy, G. O'Brien, C. Bean, J. McCloskey and S. Nalbant
- 1445 - 1500 **Using a genetic algorithm (GA) to accelerate a Monte Carlo Slip Estimation (MCSE) technique**
A. Lindsay, J. McCloskey, S. Nalbant, S. Murphy and N. Simão
- 1500 - 1530 **Tea/Coffee and Posters**
- 1530 - 1545 **The systematic study of the stability of forecasts in the rate- and state-dependent model**
D. De Gaetano, J. McCloskey and S. Nalbant
- 1545 - 1600 **The shear velocity structure of the lithospheric mantle beneath Tibet**
M.R. Agius and S. Lebedev
- 1600 - 1615 **Anisotropic structure of the upper mantle, imaged using surface and S waveform tomography**
A.J. Schaeffer and S. Lebedev
- 1615 - 1630 **Stratification of seismic anisotropy and deformation beneath South Africa, from the upper crust to the asthenosphere**
J. Adam and S. Lebedev
- 1630 **Prizes and close of meeting**

POSTER ABSTRACTS

Chemical and Isotopic Study of Sulfides from Conglomerate Group Ore, Navan, Ireland

G.J. Barker, J.F. Menuge, A.J. Boyce and C.D. Barrie

IRETHERM: Multi-disciplinary investigation of Irish warm springs and their potential for geothermal energy provision

S. Blake, M.R. Muller, A.G. Jones and the IRETHERM team

Quaternary sediment facies distribution in the Rockall trough, NE Atlantic

D. Borrego, A. Georgiopoulou, P.M. Shannon, P.D.W. Haughton, S. Benetti, J.N. Turner and S. Krastel

The IRETHERM project: Assessment of primary and secondary porosity media as possible geothermal aquifers

R. Delhaye, M. Muller, M. Loewer, A.G. Jones, D. Reay and the IRETHERM Team

The Tellus Border Project: aeromagnetic mapping of six northern counties of ROI

M. Desissa and J. Hodgson

Ice Sheet Dynamics and the Formation of Subglacial Bedforms

P. Dunlop, C. Stokes, C.D. Clark, F. Ng, R.C.A Hindmarsh, A.C. Fowler, M. Spagnolo, H. Gramberg, S.L. Greenwood and A.L.C. Hughs

Conodont biostratigraphy of the Clare Shale Formation at Paradise House, Ballynacally, Clare

P. Fallon and J. Murray

The IRETHERM project: Assessing the geothermal energy potential of Irish radiogenic granites and expanding Ireland's temperature database

T. Farrell, A.G. Jones, M.R. Muller, M. Feely, R. Goodman and the IRETHERM team

New Zealand earthquakes - Christchurch 2010-2011

D. Fay

Gondwana reconstructions and geology of the ice covered interior East Antarctica: constraints from the Pb isotope composition of feldspar

M. J. Flowerdew, S. Tyrrell, S.D. Boger, I.C.W. Fitzsimons, S.L. Harley, E.V. Mikhalsky, S.N. Thomson and A.P.M. Vaughan

Geothermal potential of the buried Drogheda and Kentstown granites, Co. Meath, Ireland

T. Fritschle, J.S. Daly, B.J. McConnell and the IRETHERM team

The spatial distribution of arsenic in gold bearing quartz veins, Croagh Patrick, Co Mayo

M. Gilligan, M. Feely, L. Morrison, T. Henry and É. Timmins

Twenty Years of the Cork Geological Association

B. Higgs and members of the CGA

Evolution and emplacement of the Northern Irish, Tyrone ophiolite during the Grampian-Taconic phase of the Caledonian-Appalachian orogen

S. Hollis, M. Cooper, S. Roberts, G. Earls, D. Condon and R. Herrington

New insights into the emplacement of the Seeconnell Complex within the Newry Igneous Complex, Northern Ireland

J. Inman, P. Anderson, M. Cooper, D. Condon, Q. Crowley, I. Meighan and C. Stevenson

Palynofacies Analysis of Santonian-Campanian Mudrocks in South-Central Montana

C. Jepson, J. Mackey, D. Jarvis and J. Hauer

Evaluating the Shale Gas Prospectivity of the NW Carboniferous Basin of Ireland

S. Khattab

Sedimentary recycling in the Millstone Grit, Yorkshire

P.J. Lancaster, S. Tyrrell and J.S. Daly

Ireland Array: New broadband seismic stations target the structure, evolution and seismicity of Ireland and surroundings

S. Lebedev, C. Horan, P. W. Readman, A.J. Schaeffer, M.R. Agius, L. Collins, F. Hauser, B. M. O'Reilly and T. Blake

Robust Shear-Velocity Profiles Within Oceanic Lithosphere and Asthenosphere: Implications for Thermal and Compositional Structure

P. Lynch, A.J. Schaeffer, M.R. Agius, and S. Lebedev

Interference of forced folds generated by a complex saucer-shaped sill network in the South Rockall Trough

C. Magee and C. Jackson

Anisotropy of Magnetic Susceptibility Data from the Rocky Mountains of Montana and Initial Comparisons to Strain Analysis Techniques

D. McCarthy, P. Meere, M. Petronis and K. Mulchrone

A multidisciplinary approach to the interpretation of rock magnetic data; a case study from the Galway Granite Batholith

W. McCarthy, R.J. Reavy, C.T. Stevenson and M.S. Petronis

A new U-Pb zircon age for the Bellewstown Terrane, eastern Ireland, constrains faunal correlations

B. McConnell, Q. Crowley and M. Parkes

The European Plate Observing System; a Research Infrastructure project for the geosciences community

B. McConnell, P. O'Connor, A.K. Braiden and C.J. Bean

The Seismic Signature of “Hidden” Faults at Magma-Poor Rifted Margins – Investigation Using Synthetic Seismic Data

K. McDermott and T. Reston

Celtic and Irish Sea Sedimentary Processes, Quaternary Stratigraphy and Offshore Wind Energy Development

M. McGrath, A. Wheeler, B. Dorschel and A. Ruffell

Reconstructing the last Newfoundland Ice Sheet through the last glacial cycle (~28ka-10ka yr BP)

M. McHenry and P. Dunlop

Constraining crustal contribution to the isotopic composition of the Antrim Lava Group, NE Ireland

C. McKenna, J.A. Gamble, P.R. Renne, R.M. Ellam, J.G. Fitton and P. Lyle

The North Anatolian Fault and lithospheric dynamics in eastern Mediterranean: A seismic surface-wave study

E. Neenan, M.R. Agius, A.J. Schaeffer and S. Lebedev

Preliminary geoarchaeology of the Late Neolithic - Early Bronze Age Ballynoe Stone Circle, Northern Ireland: geological stone provenance and feedback into glacial flow paths

C. Ni Luachrain, I. Meighan, M. Cooper, A. Burl and A. Donald

Outcrop and thin section analysis of the Namurian Clare Shale Formation: A sedimentological perspective on the variability within shale gas reservoirs

K. Nolan, J. Redfern, B.P.J. Williams, K.G. Taylor and J.P. Armstrong

Investigation of groundwater flow pathways in a Karst Aquifer using static & towed Electrical Resistivity Tomography (ERT) Data

Y. O’Connell, E. Daly and T. Henry

Multidisciplinary characterisation of methane seepage features in Irish waters

Shane O’Reilly, Michal Szpak, Paul Flanagan, Xavier Monteys, Christopher Allen, Brian Kelleher

A large glacio-tectonic raft of Carboniferous Limestone in Killala Bay, Co. Mayo

M.E. Philcox

Implications for crustal accretion and evolution within the Caledonian Orogen: Results from anisotropic Rayleigh-wave tomography in Ireland

G. Polat, S. Lebedev, P.W. Readman, B.M. O’Reilly and F. Hauser

Topographic and climatic controls on sand dispersal into NW European Triassic basins

S. Tyrrell, P.D.W. Haughton, P.M. Shannon and J.S. Daly

Ductile deformation of late Pleistocene peat and altered Palaeogene basalt by possibly sub-glacial mass-wasting into a gypsum karst fluvial system at Knocknacran, Co Monaghan, Ireland

A.P.M. Vaughan, L.A. Dowling, F.J.G. Mitchell, S.E. Lauritzen and P. Coxon

Petrography of fluid inclusions in sandstones of Es4x-Ek1s formations in Dongying depression, China

J. Wang, Y. Cao, M. Feely and A. Costanzo

Constructing a model of 3D radiogenic heat production in Ireland

N.M. Willmot Noller, J.S. Daly and the IREITHERM team

Geothermal energy potential of the Greater Dublin area and the Mourne Mountains Granite Complex

C. Yeomans, M. Muller, J.S. Daly, A.G. Jones and the IREITHERM team