

Daily Column

In 1665, peering through an early microscope, Van Leeuwenhoek discovered “a new world in a drop of water”: microorganisms. Centuries later, we have come to expect that zooming into complex systems will reveal new worlds. But what if we zoomed and zoomed but saw only the same processes acting at smaller and smaller scales? This is Mandelbrot’s self-similar scaling: a part when enlarged is similar to the whole; it is exemplified by fractal sets and isotropic turbulence.

Today, we understand self-similarity as a special case of the quite general notion of scale invariance that can apply to space, to time, to space-time. The key is to allow for anisotropy so that a part – when enlarged and squashed and/or rotated – is the same as the whole. As we zoom in, the morphologies change even though the dynamics do not. Fooled by appearances, the new worlds are no more than old worlds in disguise!

Scale-invariant models of geosystems now range from atmospheric, oceanic and space plasma turbulence, to precipitation, seismic activity, topography, volcanoes and more. Even conventional numerical models of the weather and climate are accurately scale invariant over most of their ranges, so that we obtain powerful stochastic understandings of these complex deterministic models.

Don’t miss today’s Union session on ‘Geocomplexity and scales’ (US1: 08:30–12:00, Room Y1)!

Shaun Lovejoy

Nonlinear Processes in Geosciences
Division President

EGU Today helps you keep up with the many activities at the EGU General Assembly by highlighting sessions and events from the programme. If you have comments or questions, please email Bárbara Ferreira at media@egu.eu. The newsletter is also available online at www.egu2015.eu/egu_today.html.

The day’s highlights at a glance

- **08:30** – Geocomplexity and scales (US1: Room Y1) / Open session on geosciences instrumentation and methods (GI0.1: Room B11) / The impact of grazing on soil, landforms, water and biota resources (SSS9.3/BG2.15/GM4.6/HS10.13: Room B13)
- **10:30** – Climate engineering: new insights from (solar) radiation management studies (AS4.16/CL3.8: Room B10)
- **12:15** – Penck lecture (KL2: Room G2)
- **13:30** – A Voyage through Scales – archives of the continental crust (GL2: Room Y1) / Permafrost open session (CR1.1/SSS0.20: Room R13) / Geoethics for society: general aspects and case studies in geosciences (EOS8: Room R12) / Stable isotopes in the atmosphere – from vapor to precipitation (AS4.8/BG1.11/CL5.11/HS7.10: Room B12) / Achievements and perspectives in scientific ocean and continental drilling (SSP3.3.1/BG6.4/CL5.13/GMPV7.3: Room B1)
- **18:00** – EGU Award Ceremony (US0: Room R1)
- **All day** – Medal lectures (various rooms: see below) / Short courses & YS events (various rooms: see overleaf) / Meet EGU (EGU Booth)

Today’s medal lectures

- Christiaan Huygens Medal Lecture by Kristine M. Larson (ML11: 09:15–10:15 / Room B11)
- Milutin Milankovic Medal Lecture by Paul Valdes (ML21: 10:30–11:30 / Room Y9)
- Beno Gutenberg Medal Lecture by Göran Ekström (ML10: 11:00–12:00 / Room G3)
- Arne Richter Award for Outstanding YS Lecture by Katrin Schroeder (ML6: 12:00–12:30 / Room Y4)
- Arne Richter Award for Outstanding YS Lecture by Jérémie Mouginot (ML8: 12:00–12:30 / Room R13)
- Alfred Wegener Medal Lecture by Sergej Zilitinkevich (ML2: 12:15–13:15 / Room Y1)
- Hannes Alfvén Medal Lecture by Robert L. Lysak (ML13: 13:30–14:30 / Room Y5)
- Lewis Fry Richardson Medal Lecture by Daniel Schertzer (ML18: 13:30–14:30 / Room B10)



EGU Award Ceremony

The EGU announced the recipients, from both European and non-European countries, of the 2015 Union medals and awards, division medals, and division outstanding young scientists awards in October. Now, these individuals, will be honoured for their important contributions to the Earth, planetary and space sciences at the EGU Award Ceremony (US0), which is taking place today from **18:00 to 19:30 in Room R1**.

A Voyage through Scales – archives of the continental crust

A lecture by Chris Hawkesworth, from the School of Earth Sciences, Bristol, UK, seeking to explore how material analysed on a wide range of scales influences how models are developed and how they may be tested. The session (GL2), for a general geoscientific audience, is taking place in **Room Y1 from 13:30 to 14:30**.

Short courses & young scientist events

- How to write a successful ERC Starting Grant proposal (SC19/TS10.1: 15:30 - 17:00 / Room B4)
- Your career 2: job applications and interviews (SC31: 17:30–19:00 / Room R4)
- Open science goes geo – part II: scientific software (SC24: 17:30–19:00 / Room B1)
- How to write a paper in geomorphology (SC47/GM11.2: 17:30–19:00 / Room G2)
- Finding funding: how to apply for a research grant (SC39: 17:30–19:00 / Room B13)
- Climate workshop for young scientists: introduction to climate modelling (SC43: 19:00–20:00 / Room B12)

GeoCinema Highlights

Room GeoCinema



Chamousset, the Song from a Cliff, 12:15–12:50

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365 Days Under Antarctic Ice, 12:50–13:50

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Monitoring Himalayan Glaciers, 13:50–14:00

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Cold Seeps in the Deep Sea/ Hydrothermal Vents in the Deep Sea, 15:45–16:00

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The Sahel Climate Laboratory, 18:25–18:45

Meet EGU at the EGU Booth

- PC Officer for Outreach to Young Scientists (Samuel Illingworth), 08:30–10:45
- EGU Outreach Committee Chair & Division President of Geochemistry, Mineralogy, Petrology & Volcanology (Nicholas Arndt), 10:00–10:45
- Division President of Energy, Resources and the Environment (Christopher Juhlin), 10:45–11:30
- Division President of Biogeosciences (Alina Stadnitskaia), 13:30–14:15
- Division President of Geodesy, 13:30–14:15
- Division President of Ocean Sciences (Peter Brandt), 14:15–15:00
- Executive Editor of Ocean Science (John M. Huthnance), 16:30–17:15

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Climate engineering: new insights from (solar) radiation management studies

The current stalemate on climate policy has brought the topic of climate engineering – or geoengineering – onto the research agenda as a potential option alongside mitigation and adaptation. A number of climate engineering techniques have been proposed as tools to ameliorate some of the effects of climate change. This session, which has Ken Caldeira (Carnegie Institution, US) and Hannele Korhonen (Finnish Meteorological Institute) as invited speakers, will present new findings from studies involving stratospheric aerosol injections, marine sky brightening and cirrus cloud thinning.

AS4.16/CL3.8: 10:30–12:00 / Room B10 & Blue Posters

Permafrost open session

A platform for the presentation and discussion of current research focusing on permafrost and associated natural systems, the interaction of permafrost and climate, and related topics.

CR1.1/SSS0.20: 13:30–17:00 / Room R13 & Yellow Posters

Open session on geosciences instrumentation and methods

The session aims to inform the scientific and engineering geosciences communities about new and/or improved instrumentation and methods, and their related new or existing applications. It includes the Christiaan Huygens Medal Lecture by Kristine M. Larson (University of Colorado, Boulder, US).

GI0.1: 08:30–12:00 / Room B11 & Red Posters



Geoethics for society: general aspects and case studies in geosciences

This session, organised by the International Association for Promoting Geoethics (www.iapg-geoethics.org), focuses on the ethical and social implications in geoscience. The two main themes this year are 'Putting geoethics at the heart of geoscience' and 'Geoethics and geohazards'.

EOS8: 13:30–17:00 / Room R12 & Red Posters

Stable isotopes in the atmosphere – from vapor to precipitation

This session brings together scientists studying the abundance of oxygen and hydrogen stable isotopes in vapor and precipitation and their relationship with climate (and other controlling factors), based on observations and models.

AS4.8/BG1.11/CL5.11/HS7.10: 13:30–17:00 / Room B12 & Blue Posters

The impact of grazing on soil, landforms, water and biota resources

This session features contributions dealing with the occurrence of land degradation processes, such as soil erosion and compaction, the importance of landform elements, the hydrologic impact of grazing and the effects on pasture yield and fodder quality in grazing areas worldwide.

SSS9.3/BG2.15/GM4.6/HS10.13: 08:30–10:15 / Room B13 & Blue Posters

Penck lecture

A lecture by Ann Rowan organised by the EGU Geomorphology Division. This year's topic is 'What can mountain glaciers tell us about climate change? Quantifying past and future discharge variations in the Southern Alps and Himalaya'.

KL2: 12:15–13:15 / Room G2

Achievements and perspectives in scientific ocean and continental drilling

This session includes contributions that present and review recent scientific results from deep Earth sampling and monitoring through ocean and continental drilling projects.

SSP3.3.1/BG6.4/CL5.13/GMPV7.3: 13:30–17:15 / Room B1 & Blue Posters

Exhibition and EGU & Friends

Exhibition booths (open Mon–Thu, 09:00–18:00 and Fri, 09:00–17:00) for companies, publishers, research facilities, and scientific organisations, are scattered throughout the Blue (Basement), Yellow (Ground Floor), and Green (First Floor) Levels. The EGU & Friends exhibition area (same opening hours) in Hall X, Blue Level, is the place to go to learn more about the EGU and its partner organisations.

What's on tomorrow

- Negotiating climate policy – resigning to resilience? (GDB3: 15:30–17:00 / Room Y1)
- Geophysics and resilience: what is at stake? (US3: 13:30–17:00 / Room B14)