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Inhibition of carbonate synthesis in acidic oceans on early Mars 423

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A Taylor vortex analogy in granular flows 433

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Fluids sheared between concentric rotating cylinders undergo a series of three-dimensional instabilities. Since Taylor's archetypal 1923 study, these have proved pivotal to understanding how fluid flows become unstable and eventually undergo transitions to chaotic or turbulent states. In contrast, predicting the dynamics of granular systems—from nano-sized particles to debris flows—is far less reliable. Under shear these materials resemble fluids, but solid-like responses, non-equilibrium structures and segregation patterns develop unexpectedly. As a result, the analysis of geophysical events and the performance of largely empirical particle technologies might suffer. Here, using gas fluidization to overcome jamming, we show experimentally that granular materials develop vortices consistent with the primary Taylor instability in fluids. However, the vortices observed in our fluidized granular bed are unlike those in fluids in that they are accompanied by novel mixing–segregation transitions. The vortices seem to alleviate increased strain by spawning new vortices, directly modifying the scale of kinetic interactions. Our observations provide insights into the mechanisms of shear transmission by particles and their consequent convective mixing.

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The magnetic polarity stratigraphy of the Mauch Chunk Formation, Pennsylvania Neil D. Opdyke and Victor J. DiVenere Proc. Natl. Acad. Sci. USA. 2004; 101(37): p. 13423-13427 <http://www.pnas.org/cgi/content/abstract/101/37/13423?ct>

The Cocos and Carnegie Aseismic Ridges: a Trace Element Record of Long-term Plume-Spreading Center Interaction KAREN S. HARPP, VIRGINIA D. WANLESS, ROBERT H. OTTO, KAJ HOERNLE, and REINHARD WERNER J. Petrology published 24 September 2004, 10.1093/petrology/egh064

<http://petrology.oupjournals.org/cgi/content/abstract/egh064v1?ct>

Bulk-rock Major and Trace Element Compositions of Abyssal Peridotites: Implications for Mantle Melting, Melt Extraction and Post-melting Processes Beneath Mid-Ocean Ridges YAOLING NIU J. Petrology published 24 September 2004, 10.1093/petrology/egh068

<http://petrology.oupjournals.org/cgi/content/abstract/egh068v1?ct>

The Gronnedal-Ika Carbonatite-Syenite Complex, South Greenland: Carbonatite Formation by Liquid Immiscibility RALF HALAMA, TORSTEN VENNEMANN, WOLFGANG SIEBEL, and GREGOR MARKL J. Petrology published 24 September 2004, 10.1093/petrology/egh069

<http://petrology.oupjournals.org/cgi/content/abstract/egh069v1?ct>

Natural radioactivity measurements in beach-rock samples of south-east coast of Tamilnadu, India V. Ramasamy, M. Dheenathayalu, R. Ravisankar, V. Ponnusamy, G. Victor Rajamanickam, DajKumar Sahayam, V. Meenakshisundram, and V. Gajendran Radiat. Prot. Dosimetry. 2004; 111(2): p. 229-235

<http://rpd.oupjournals.org/cgi/content/abstract/111/2/229?ct>

Fractionation of the Platinum-Group Elements During Mantle Melting Conny Bockrath, Chris Ballhaus, and Astrid Holzheid Science. 2004; 305(5692): p. 1951-1953

<http://www.sciencemag.org/cgi/content/abstract/305/5692/1951?ct>

GEOPHYSICS: Silent Heralds of Megathrust Earthquakes? Alfred Hirn and Mireille Laigle Science. 2004; 305(5692): p. 1917-1918

<http://www.sciencemag.org/cgi/content/summary/305/5692/1917?ct>

Sulfide-Driven Segregation Science. 2004; 305(5692): p. 1869e

<http://www.sciencemag.org/cgi/content/summary/305/5692/1869e?ct>

INVERTEBRATE BIOLOGY: Lobster Tales Esther Sternberg Science. 2004; 305(5692): p. 1914

<http://www.sciencemag.org/cgi/content/summary/305/5692/1914?ct>

PALEONTOLOGY: China Clamps Down on Mining to Preserve Cambrian Site Dennis Normile and Xiong Lei Science. 2004; 305(5692): p. 1893-1894

<http://www.sciencemag.org/cgi/content/summary/305/5692/1893?ct>

Ice Flow Direction Change in Interior West Antarctica Martin J. Siegert, Brian Welch, David Morse, Andreas Vieli, Donald D. Blankenship, Ian Joughin, Edward C. King, Gwendolyn J.-M. C. Leysinger Vieli, Antony J. Payne, and Robert Jacobel Science. 2004; 305(5692): p. 1948-1951

<http://www.sciencemag.org/cgi/content/abstract/305/5692/1948?ct>

A Triassic Aquatic Protorosaur with an Extremely Long Neck Chun Li, Olivier Rieppel, and Michael C. LaBarbera Science. 2004; 305(5692): p. 1931

<http://www.sciencemag.org/cgi/content/abstract/305/5692/1931?ct>

Spatial and temporal patterns of phytoplankton composition in subtropical coastal lagoon, the Indian River Lagoon, Florida, USA S. Badylak and E. J. Philips J. Plankton Res. 2004; 26(10): p. 1229-1247

<http://plankt.oupjournals.org/cgi/content/abstract/26/10/1229?ct>

Alicyclobacillus vulcanalis sp. nov., a thermophilic, acidophilic bacterium isolated from Coso Hot Springs, California, USA Jessica Simbahan, Rhae Drijber, and Paul Blum IJSEM. 2004; 54(5): p. 1703-1707 <http://ijs.sgmjournals.org/cgi/content/abstract/54/5/1703?ct>

Desulfovibrio bastinii sp. nov. and Desulfovibrio gracilis sp. nov., moderately halophilic, sulfate-reducing bacteria isolated from deep subsurface oilfield water Michel Magot, Odile Basso, Christele Tardy-Jacquenod, and Pierre Caumette IJSEM. 2004; 54(5): p. 1693-1697 <http://ijs.sgmjournals.org/cgi/content/abstract/54/5/1693?ct>

A Ruffell and P Wiltshire Conjunctive use of quantitative and qualitative X-ray diffraction analysis of soils and rocks for forensic analysis. Forensic Sci Int 4 Oct 2004 145(1): p. 13. <http://highwire.stanford.edu/cgi/medline/pmid:15374590>

A Poletini and R Pomi The leaching behavior of incinerator bottom ash as affected by accelerated ageing. J Hazard Mater 10 Sep 2004 113(1-3): p. 209. <http://highwire.stanford.edu/cgi/medline/pmid:15363533>

L Cox, MC Fernandes, A Zsolnay, MC Hermosin, and J Cornejo Changes in dissolved organic carbon of soil amendments with aging: effect on pesticide adsorption behavior. J Agric Food Chem 8 Sep 2004 52(18): p. 5635. <http://highwire.stanford.edu/cgi/medline/pmid:15373404>

RA Kerr Geochemistry. In mass extinction, timing is all. Science 17 Sep 2004 305(5691): p. 1705. <http://highwire.stanford.edu/cgi/medline/pmid:15375244>

A Halliday Geochemistry: the clock's second hand. Nature 16 Sep 2004 431(7006): p. 253. <http://highwire.stanford.edu/cgi/medline/pmid:15372013>

RP Liferovich and RH Mitchell Geikielite-ecandrewsite solid solutions: synthesis and crystal structures of the Mg(1-x)Zn(x)TiO(3) ($0 \leq x \leq 0.8$) series. Acta Crystallogr B 1 Oct 2004 60(Pt 5): p. 496. <http://highwire.stanford.edu/cgi/medline/pmid:15367784>

SA Buckley, KA Clark, and RP Evershed Complex organic chemical balms of Pharaonic animal mummies. Nature 16 Sep 2004 431(7006): p. 294. <http://highwire.stanford.edu/cgi/medline/pmid:15372029>

M Krachler, J Zheng, D Fisher, and W Shotyk Direct Determination of Lead Isotopes ((206)Pb, (207)Pb, (208)Pb) in Arctic Ice Samples at Picogram per Gram Levels Using Inductively Coupled Plasma-Sector Field MS Coupled with a High-Efficiency Sample Introduction System. Anal Chem 15 Sep 2004 76(18): p. 5510. <http://highwire.stanford.edu/cgi/medline/pmid:15362914>

H. BRADLEY Shaffer, GREGORY B. Pauly, JEFFREY C. Oliver, and PETER C. Trenham The molecular phylogenetics of endangerment: cryptic variation and historical phylogeography of the California tiger salamander, Ambystoma californiense. Mol Ecol 1 Oct 2004 13(10): p. 3033. <http://highwire.stanford.edu/cgi/medline/pmid:15367118>

R Lopez, M Garcia-Talavera, R Pardo, L Deban, and JC Nalda Natural radiation doses to the population in a granitic region in Spain. Radiat Prot Dosimetry 1 Jan 2004 111(1): p. 83. <http://highwire.stanford.edu/cgi/medline/pmid:15367774>

S Oke Alternative designs for petroleum product storage tanks for groundwater protection. J Toxicol Environ Health A 22 Oct 2004 67(20-22): p. 1717. <http://highwire.stanford.edu/cgi/medline/pmid:15371211>

A Widerlund, G Eben, and J Landin Potential biogeochemical and ecological development of a flooded tailings impoundment at the Kristineberg Zn-Cu mine, northern Sweden. Sci

Total Environ 15 Oct 2004 333(1-3): p. 249.
<http://highwire.stanford.edu/cgi/medline/pmid;15364533>

QZ Yin Planetary science. Predicting the Sun's oxygen isotope composition. Science 17 Sep 2004 305(5691): p. 1729. <http://highwire.stanford.edu/cgi/medline/pmid;15375257>

AM Williams Shaping the practice of home care: critical case studies of the significance of the meaning of home. Int J Palliat Nurs 1 Jul 2004 10(7): p. 333.
<http://highwire.stanford.edu/cgi/medline/pmid;15365486>

Integrated geophysical surveys on waste dumps: evaluation of physical parameters to characterize an urban waste dump (four case studies in Italy) Ettore Cardarelli and Gerardina Di Filippo Waste Management Research. 2004; 22(5): p. 390-402
<http://wmr.sagepub.com/cgi/content/abstract/22/5/390?ct>

The influence of sulfur and iron on dissolved arsenic concentrations in the shallow subsurface under changing redox conditions Peggy A. O'Day, Dimitri Vlassopoulos, Robert Root, and Nelson Rivera Proc. Natl. Acad. Sci. USA. 2004; 101(38): p. 13703-13708 <http://www.pnas.org/cgi/content/abstract/101/38/13703?ct>

Generation of methane in the Earth's mantle: In situ high pressure-temperature measurements of carbonate reduction Henry P. Scott, Russell J. Hemley, Ho-kwang Mao, Dudley R. Herschbach, Laurence E. Fried, W. Michael Howard, and Sorin Bastea Proc. Natl. Acad. Sci. USA published 20 September 2004, 10.1073/pnas.0405930101
<http://www.pnas.org/cgi/content/abstract/0405930101v1?ct>

Riparian deforestation, stream narrowing, and loss of stream ecosystem services Bernard W. Sweeney, Thomas L. Bott, John K. Jackson, Louis A. Kaplan, J. Denis Newbold, Laurel J. Standley, W. Cully Hession, and Richard J. Horwitz Proc. Natl. Acad. Sci. USA published 20 September 2004, 10.1073/pnas.0405895101
<http://www.pnas.org/cgi/content/abstract/0405895101v1?ct>

Electronic spin state of iron in lower mantle perovskite Jie Li, Viktor V. Struzhkin, Ho-kwang Mao, Jinfu Shu, Russell J. Hemley, Yingwei Fei, Bjorn Mysen, Przemek Dera, Vitali Prakapenka, and Guoyin Shen Proc. Natl. Acad. Sci. USA published 17 September 2004, 10.1073/pnas.0405804101 <http://www.pnas.org/cgi/content/abstract/0405804101v1?ct>

Drug Discovery, CAM and Natural Products Edwin L. Cooper Evid. Based Complement. Alternat. Med. published 17 September 2004, 10.1093/toxsci/neh032
<http://ecam.oupjournals.org/cgi/content/abstract/neh032v2?ct>

PLANETARY SCIENCE: Predicting the Sun's Oxygen Isotope Composition Qing-zhu Yin Science. 2004; 305(5691): p. 1729-1730
<http://www.sciencemag.org/cgi/content/summary/305/5691/1729?ct> IMAGES: Not of This World Science. 2004; 305(5691): p. 1687b
<http://www.sciencemag.org/cgi/content/summary/305/5691/1687b?ct>

Age and Timing of the Permian Mass Extinctions: U/Pb Dating of Closed-System Zircons Roland Mundil, Kenneth R. Ludwig, Ian Metcalfe, and Paul R. Renne Science. 2004; 305(5691): p. 1760-1763
<http://www.sciencemag.org/cgi/content/abstract/305/5691/1760?ct>

Middle Miocene Southern Ocean Cooling and Antarctic Cryosphere Expansion Amelia E. Shevenell, James P. Kennett, and David W. Lea Science. 2004; 305(5691): p. 1766-1770
<http://www.sciencemag.org/cgi/content/abstract/305/5691/1766?ct>

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