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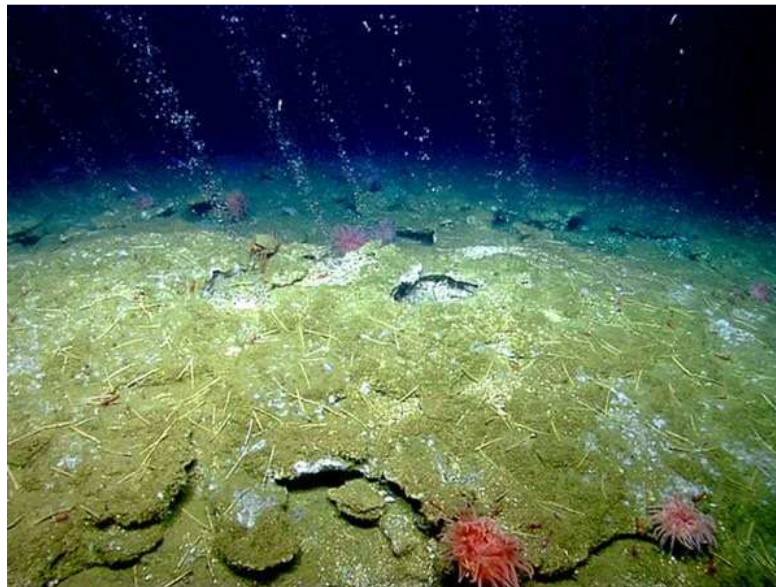


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<http://www.geologypage.com/2015/01/researchers-discover-scientific.html#ixzz3O86UPALM>
[Researchers discover scientific surprise studying underwater methane seeps](#)



*Natural methane seeps off the U.S. coast may have been active for thousands of years.
2013 Northeast U.S. Canyons Expedition/NOAA Okeanos Explorer Program*

Methane seeps—ever heard of them?

You might have this past summer. That's when the national news media featured stories about a recent discovery of hundreds of methane seeps—where methane gas bubbles up from the sea floor—in the North Atlantic Ocean. The discussion about this scientific find typically turned to important questions about the methane's impact on climate change, but there is another interesting question about methane seeps.

What are the creatures and ecosystems that exist there?

Researchers at Indiana State University have been studying methane seep ecosystems for a number of years, making trips underwater to investigate the unique association of organisms that live there. On their most recent trip to study seeps, Indiana State scientists made a big discovery regarding a tiny creature that lives in both seep and non-seep habitats.

In collaboration with Scripps Institute of Oceanography and California Institute of Technology, an Indiana State professor, graduate and

undergraduate students embarked on a series of cruises to the methane seeps near Oregon and Costa Rica in 2010. With little previously known about the biological communities living in and around the rocks common in these deep-sea environments, researchers pursued a variety of investigations to learn more about the organisms and ecosystems at different seep habitats and nearby non-seep environments.

One investigation, led by Indiana State professor Tony Rathburn and doctoral student Ashley Burkett, stumbled upon an overabundance of a microscopic organism—a species of "benthic foraminifera"—that could change how scientists understand past environments.

"We found over 1,000 individuals of this specific species," Burkett said. "The species is really interesting for us, and it's used to figure out what the climate was like in the geologic past."

Living on the sea floor, benthic foraminifera are microscopic creatures that produce an equally microscopic shell. The particular species of foraminifera that Rathburn and Burkett found was previously thought only to live in environments with high levels of dissolved oxygen. When scientists have found the shells of this creature in the fossil record, they have thought that the presence of the species indicated a well-oxygenated environment at a specific time in geologic history. With that idea in mind, scientists have developed a concept of what the ocean and climate was like in the past.

So, finding this species in abundance in both seep and non-seep environments where oxygen is limited was unexpected. Based on their research, Rathburn and Burkett speculate that it's not the abundance of oxygen that determines where these creatures are located. It may simply be that they're present where there are hard surfaces on the sea floor for them to live on.

"Scientists have used the presence of the species as an indicator of well-oxygenated environments," Burkett said. "But this may not be the case. It may have been that there was an absence of nice rocks to colonize in the soupy sediments of poorly oxygenated environments."

This important find was also just as unintended as it was unexpected. Rathburn and Burkett came upon these foraminifera while conducting a multifaceted seafloor experiment. Their original intent was to determine how long the tissue of foraminifera would remain on the sea floor after death. But to their delight, they got more than they asked for thanks to, of all things, plastic.

For their original experiment, they had placed test subjects inside a steel cage wrapped in plastic mesh, and this contraption was pushed half way into the sea floor sediment. Rathburn and Burkett chose the plastic mesh, because it was durable, easy to use and wouldn't deteriorate quickly. But it turns out that the mesh was a foraminifera magnet - after a year on the sea floor, the creatures had colonized on the plastic.

"We pulled the cages up (from the sea floor), and I started to disassemble them. We were looking at the tops of the cages and commented that there was all this goo on them One of us said, 'We should look at this.'"

And look she did. Using a microscope, Burkett examined the "goo" and discovered this unexpected creature. Many hours were spent painstakingly picking off all the foraminifera—about a thousand of them—from the cages, and examining the data.

Burkett presented her surprise findings this past October to the scientific community at a meeting of the Geologic Society of America in Vancouver, Canada. The response was positive.

"At this meeting, we shocked people with our results," Rathburn said. "(Our research) will shake up our ideas about how to use these creatures in the interpretation of the environments of the past."

Note : The above story is based on materials provided by Indiana State University.

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<http://www.geologypage.com/2014/04/heating-things-up-what-drives-elevation.html#ixzz3N9G3VWAv>

Heating Things Up: What Drives Elevation Along Mid-Ocean Ridges?

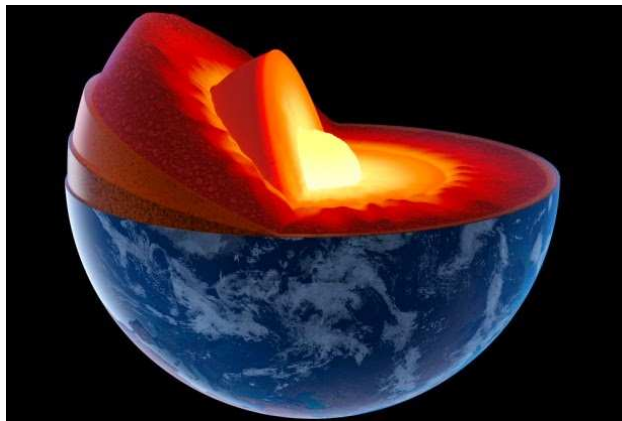


Image Credit: Johan Swanepoel / Shutterstock

The contours of the Earth's crust are influenced by the high temperatures deep within the Earth's mantle, according to a new study published in *Science*. A team of researchers, led by Brown University, demonstrated that those temperature differences control the elevation and volcanic activity along mid-ocean ridges, the colossal mountain ranges that line the ocean floor.

Forming at the boundaries of tectonic plates, mid-ocean ridges circle the globe like seams on a baseball. Magma from deep within the Earth rises up to fill in the cracks between the plates as they move apart, creating fresh crust on the ocean floor as it cools. This new crust is thicker in some places than others, forming ridges with widely varying elevations. In some parts of the world, these ridges are deep in the ocean, miles beneath the surface. In other places such as Iceland, the ridge tops are exposed above the ocean's surface.

"These variations in ridge depth require an explanation," said Colleen Dalton, assistant professor of geological sciences at Brown.

"Something is keeping them either sitting high or sitting low."

The research team discovered that the "something" was the temperature of the rocks deep below the Earth's surface.

At depths extending below 250 miles, the team was able to show that mantle temperatures along the ridges vary by as much as 250 degrees Celsius by analyzing the speeds of seismic waves generated by earthquakes. They found that, in general, higher points on the ridges are associated with higher temperatures, while lower points are associated with cooler temperatures. One unsurprising finding of this study is that volcanic hot spots along the ridges — such as volcanoes near Iceland, and the islands of Ascension and Tristan da Cunha — all sit above warm spots in the mantle.

"It is clear from our results that what's being erupted at the ridges is controlled by temperature deep in the mantle," Dalton told Brown University's Kevin Stacey. "It resolves a long-standing controversy and has not been shown definitively before."

The mid-ocean ridges function as a window to the interior of the planet for geologists by providing clues about the properties of the mantle below.

A thicker crust is suggested by a higher ridge elevation, indicating that a larger volume of magma erupted at the surface. The new study explains that this excess magma could have been caused by very hot temperatures in the mantle. The fact that hot mantle material is not the only way to produce excess magma, however, presents a challenge to this theory. The amount of melt is also controlled by the chemical composition of the mantle. Some rock compositions melt at lower temperatures, allowing for a larger volume of molten rock. Because of this, it has been unclear for the last several decades whether mid-ocean ridge elevations are caused by variations in the temperature of the mantle or variations in the rock composition of the mantle.

Dalton's team introduced two additional data sets to help them distinguish between these two possible scenarios.

One data set was the chemistry of basalts, the rock that forms from the solidification of magma at the mid-ocean ridge. Basalt

compositions can vary greatly depending on the temperature and composition of the mantle material from which they're derived. To create this data set, the researchers analyzed almost 17,000 basalts formed along mid-ocean ridges worldwide.

Seismic wave tomography made up the second data set. During earthquakes, seismic waves pulse through the rock of the crust and the mantle. Scientists measure the velocity of those waves to gather data about the characteristics of the rocks through which they passed. "It's like performing a CAT scan of the inside of the Earth," Dalton added. Temperature has a great effect on seismic wave speeds, with waves propagating more quickly in cooler rocks than in hotter ones.

By comparing the seismic data from hundreds of earthquakes to data on elevation and rock chemistry from the ridges, the team found correlations which revealed that temperatures deep in the mantle varied between 1,300 and 1,550 degrees Celsius underneath about 38,000 miles of ridge terrain. "It turned out," said Dalton, "that seismic tomography was the smoking gun. The only plausible explanation for the seismic wave speeds is a very large temperature range."

The results demonstrated that as mantle temperatures fall, so too do ridge elevations. The hottest point beneath the ridges was found to be near Iceland — also the site of the ridges' highest elevation — while the lowest temperatures were found near the lowest point, an area of very deep and rugged seafloor known as the Australian-Antarctic discordance in the Indian Ocean.

There has been a long-standing debate in the scientific community about whether a mantle plume — a vertical jet of hot rock originating from deep in the Earth — intersects the mid-ocean ridge in Iceland. The findings of this study provide strong support for this theory, as well as for mantle plumes being the culprit for the excess magma volume in all regions with above-average temperatures near volcanic hot spots.

The Earth's mantle does not sit still, despite being made of solid rock. It is constantly undergoing convection, where material from the depths of the Earth churns towards the surface and back again.

"Convection is why we have plate tectonics and earthquakes," Dalton said. "It's also responsible for almost all volcanism at the surface. So understanding mantle convection is crucial to understanding many fundamental questions about the Earth."

There are two main factors in the mechanism of convection: variations in the composition of the mantle and variations in its temperature. Dalton says that their findings point to temperature as a primary factor in how convection is expressed on the surface.

"We get consistent and coherent temperature measurements from the mantle from three independent datasets," Dalton said. "All of them suggest that what we see at the surface is due to temperature, and that composition is only a secondary factor. What is surprising is that the data require the temperature variations to exist not only near the surface but also many hundreds of kilometers deep inside the Earth."

Dalton says that the findings will be useful for future research using seismic waves because the temperature readings as indicated by seismology were backed up by the other datasets. This allows them to be used to calibrate seismic readings for places where geochemical samples aren't available, allowing scientists to estimate temperature deep in the Earth's mantle all over the globe.

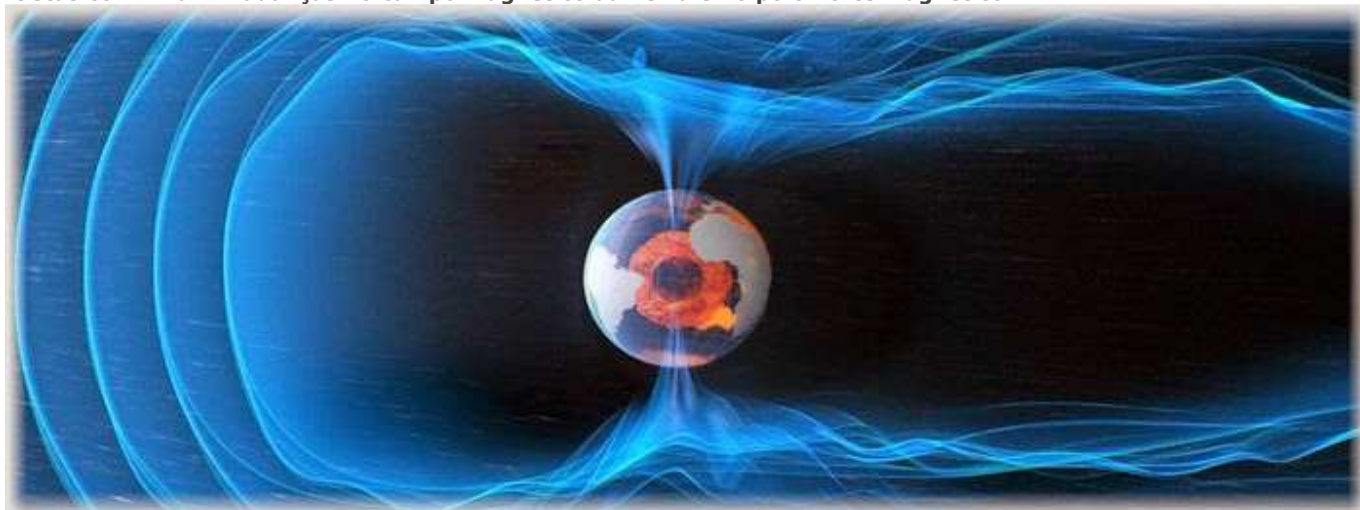
Note : The above story is based on materials provided by April Flowers for redOrbit

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http://www.galeriadometeorito.com/2014/07/cientistas-confirmam-mudancas-no-campo-magnetico-polo-norte-magnetico-terra.html#.VK8raSvF_Cs

Cientistas confirmam mudanças no campo magnético da Terra e no polo norte magnético



14/07/14 - Além disso, a Anomalia do Atlântico Sul está ainda mais intensa

Os primeiros resultados dos três satélites Swarm da Agência Espacial Europeia (ESA) revelam as mais recentes **mudanças no campo magnético** que protege o nosso planeta.

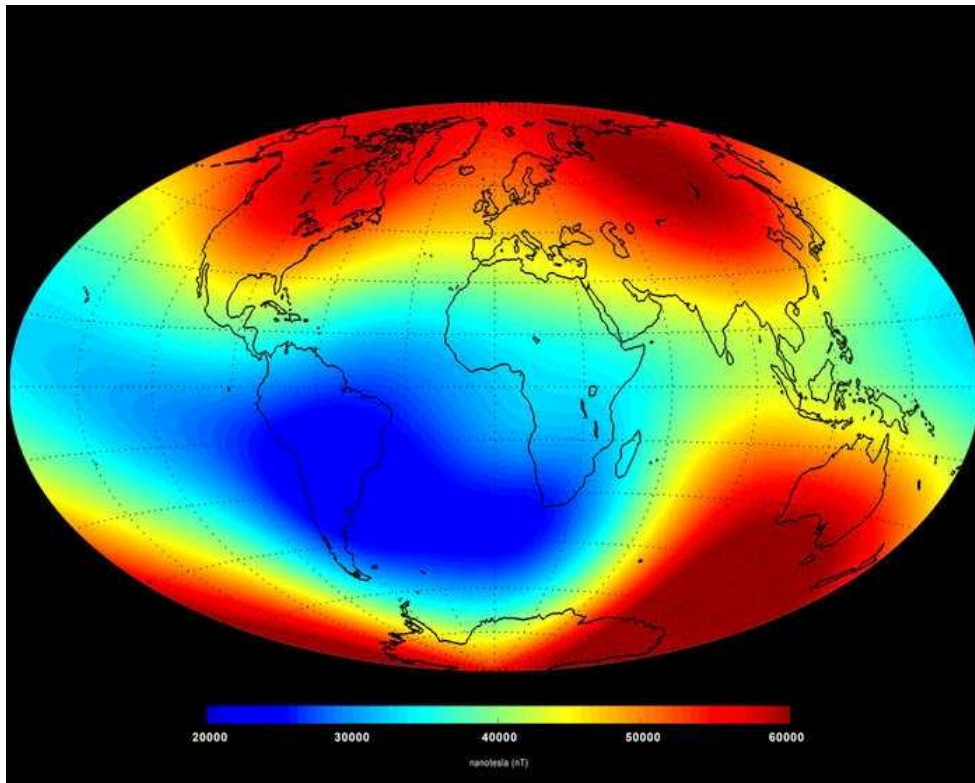
Lançado em novembro de 2013, Swarm está fornecendo informações sem precedentes sobre o complexo funcionamento do **campo magnético da Terra**, o que nos protege da radiação cósmica e das partículas carregadas que nos bombardeiam diariamente.

Medições feitas ao longo dos últimos seis meses confirmam a tendência geral de **enfraquecimento do campo magnético da Terra**, com as quedas mais dramáticas sobre o Hemisfério Ocidental. Já em outras áreas, como a região sul do Oceano Índico, o campo magnético tem se fortalecido.

As últimas medições confirmam também o **movimento do polo norte magnético para a Sibéria**.

Estas modificações são baseadas nos sinais magnéticos provenientes do núcleo da Terra. Nos próximos meses, os cientistas vão analisar os dados sobre os grandes contribuidores do **campo magnético terrestre**, como o manto, a crosta, os oceanos, a ionosfera e a magnetosfera.

O campo magnético é fraco por aqui

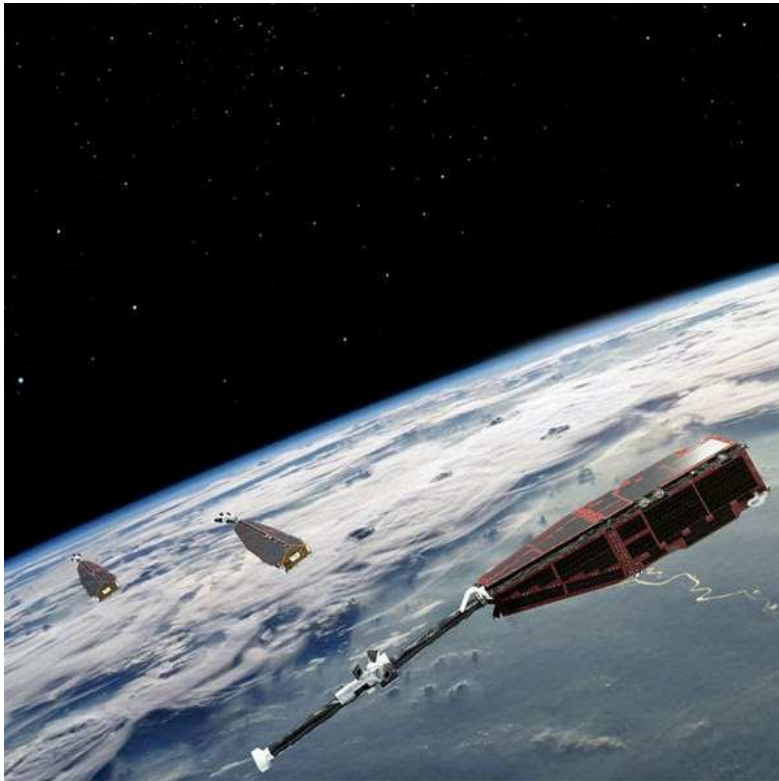


Dados de junho de 2014 mostram intensidade do campo magnético da superfície da Terra.
Créditos: ESA / DTU Space

A região do Brasil que é mostrada em azul no mapa, representa a **Anomalia do Atlântico Sul (AMAS)**. Essa anomalia ocorre devido a uma depressão ou achatamento nas linhas do **campo magnético da Terra** acima dessa região. A **AMAS** foi descoberta em 1958, e sofre alterações frequentemente.

Por conta do **campo magnético** ser **mais fraco** na região em azul (**acima do Brasil**), partículas carregadas se aproximam mais da alta atmosfera dessa região, e por conta disso, os **níveis de radiação são mais elevados** nesse perímetro.

Na superfície os efeitos são insignificantes, segundo os cientistas. Já em grandes altitudes, a **Anomalia do Atlântico Sul causa efeitos radioativos em satélites e espaçonaves.**



Satélites Swarm (conhecidos como constelação Swarm) orbitando a Terra.
Créditos: ESA / AOES Medialab

Os satélites que passam acima do Brasil, principalmente acima da região sudeste do país, enfrentam **fortes rajadas de radiação cósmica**, e por isso, necessitam de proteções especiais.

Conclusão

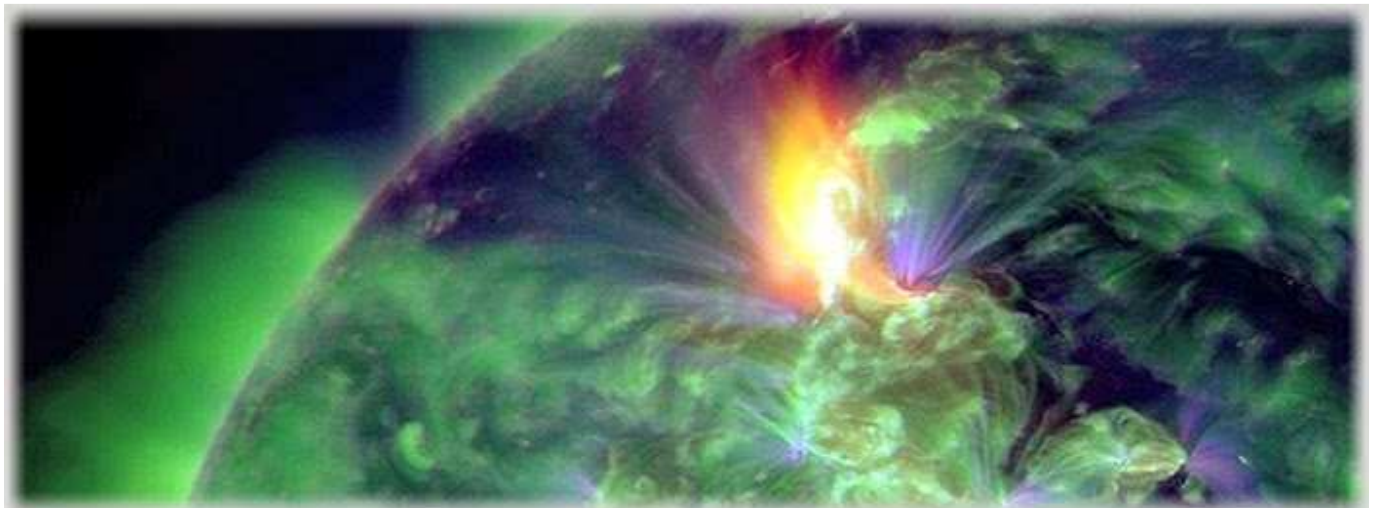
Esses estudos deverão proporcionar uma nova visão sobre muitos processos naturais, desde aqueles que ocorrem dentro do nosso planeta até a meteorologia espacial, que é desencadeada pela atividade solar. Tudo isso deverá produzir uma melhor compreensão das **causas do enfraquecimento do campo magnético da Terra**.

Os primeiros resultados desse estudo foram apresentados no Terceiro Encontro de Ciências do Swarm, em Copenhague, Dinamarca.

Fonte: ESA / Swarm

Imagens: ESA / ATG Medialab / DTU Space

http://www.galeriadometeorito.com/2013/12/descoberto-acelerador-cosmico-na-magnetosfera-terrestre.html#.VK8shSvF_Cs
Descoberto um colossal acelerador cósmico acima da Terra



06/12/13 - Ele é parecido com o Grande Colisor de Hádrons do CERN, porém muito, muito maior

Uma pesquisa recém divulgada identificou a existência de um acelerador cósmico gigante acima da terra. O acelerador natural do espaço "sincroton" tem escala de centenas de milhares de quilômetros, superando até mesmo os maiores aceleradores artificiais semelhantes, como o Grande Colisor de Hádrons do CERN, que tem uma circunferência de apenas 27 quilômetros.



Foto mostra as dependências do CERN e parte do colisor de partículas.
Créditos: CERN / Clique na imagem para ampliar

Ao analisar os dados das sondas de Van Allen da NASA, o físico Ian Mann, da Universidade de Alberta, junto com seus colegas da NASA e de outros institutos, foram capazes de medir e identificar a "arma de fumaça" de um processo de escala planetária que acelera partículas a velocidades próximas à velocidade da luz, e tudo isso acontece dentro do cinturão de radiação de Van Allen.

Ian Mann diz que este acelerador de partículas coleta energia a partir de flares e erupções solares que chegam até aqui através do vento solar, funcionando como uma central de energia aeólica. Este 'acelerador natural' se encontra na região dominada pelo campo magnético da Terra, a magnetosfera. A descoberta é um grande passo para a compreensão de tempestades espaciais e para proteger sistemas artificiais em Terra e no espaço de possíveis danos das tempestades espaciais e do clima espacial severo.

"O quebra-cabeça dessa nova descoberta é: como as partículas se aceleram até quase a velocidade da luz?" comenta Ian.

O perigo para a nossa tecnologia



Ilustração mostra danos que poderiam ser causados se uma grande tempestade como a de Carrington acontecesse nos dias atuais.
Clique na imagem para ampliar

Ian diz que esta aceleração de partículas pode danificar satélites e representa um risco para os astronautas durante as tempestades de clima espacial, e é semelhante à relação entre um surfista e uma onda, em que as partículas pegam uma "carona" em

uma onda que as envia como em um foguete e as colocam em órbita com a Terra. À medida que essas partículas circulam a Terra, elas podem ser pegadas por uma nova "onda", ou até mesmo pela mesma, o que irá aumentar a sua velocidade ainda mais. "O resultado é um ciclo perpétuo em que as partículas são aceleradas por ondas em escalas planetárias, abrangendo centenas de milhares de quilômetros", disse Ian.

Assim como as tempestades climáticas da Terra, as tempestades espaciais podem ser leves, moderadas ou fortes. Ian diz que essas tempestades solares podem ter vários efeitos sobre a infra-estrutura tecnológica na Terra, desde leves interrupções das comunicações por satélites, ou até mesmo danos generalizados de sistemas de telégrafo, como ocorreu durante a tempestade solar Carrington de 1859, que se manifestam na Terra como brilhantes auroras boreais e austrais.

"Há relatos publicados em jornais de testemunhas oculares que viram linhas telegráficas se incendiando como resultado das correntes elétricas que penetraram na infra-estrutura terrestre devido à essas tempestades espaciais", disse Ian, acrescentando que o dano potencial de uma tempestade como essa, no mundo altamente tecnológico em que vivemos atualmente, poderia custar trilhões de dólares em perdas e reparos.

Ian diz que a compreensão do clima espacial ainda está em fase de descobertas, porém com resultados como este, os pesquisadores estão chegando cada vez mais próximos de produzir previsões do clima espacial mais precisas.

"Ainda estamos tentando compreender como uma grande tempestade espacial seria, e qual impacto que ela poderia ter sobre a infra-estrutura tecnológica atual (satélites, sistemas operacionais e de energia)", disse Ian. "Finalmente estamos tentando melhorar alguns dos nossos sistemas de proteção contra o clima espacial severo".

Fonte: Dailygalaxy ; University of Alberta

Imagem: NASA SDO

<http://www.geologypage.com/2011/10/possible-trigger-for-volcanic-super.html#ixzz3O8CmyQNO>
[Possible Trigger for Volcanic 'Super-Eruptions' Discovered](#)

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Volcano. (Credit: © Beboy / Fotolia)

The "super-eruption" of a major volcanic system occurs about every 100,000 years and is considered one of the most catastrophic

natural events on Earth, yet scientists have long been unsure about what triggers these violent explosions.

However, a new model presented this week by researchers at Oregon State University points to a combination of temperature influence and the geometrical configuration of the magma chamber as a potential cause for these super-eruptions.

Results of the research, which was funded by the National Science Foundation, were presented at the annual meeting of the Geological Society of America in Minneapolis, Minn.

Patricia "Trish" Gregg, a post-doctoral researcher at OSU and lead author on the modeling study, says the creation of a ductile halo of rock around the magma chamber allows the pressure to build over tens of thousands of years, resulting in extensive uplifting in the roof above the magma chamber. Eventually, faults from above trigger a collapse of the caldera and subsequent eruption.

"You can compare it to cracks forming on the top of baking bread as it expands," said Gregg, a researcher in OSU's College of Oceanic and Atmospheric Sciences. "As the magma chamber pressurizes at depth, cracks form at the surface to accommodate the doming and expansion. Eventually, the cracks grow in size and propagate downward toward the magma chamber.

"In the case of very large volcanoes, when the cracks penetrate deep enough, they can rupture the magma chamber wall and trigger roof collapse and eruption," Gregg added.

The eruption of super-volcanoes dwarfs the eruptions of recent volcanoes and can trigger planetary climate change by inducing Ice Ages and other impacts. One such event was the Huckleberry Ridge eruption of present-day Yellowstone Park about two million years ago, which was more than 2,000 times larger than the 1980 eruption of Mount St. Helens in Washington.

"Short of a meteor impact, these super-eruptions are the worst environmental hazards our planet can face," Gregg said. "Huge amounts of material are expelled, devastating the environment and creating a gas cloud that covers the globe for years."

Previous modeling efforts have focused on an eruption trigger from within the magma chamber, which scientists thought would leave a visible trace in the form of a precursor eruption deposits, according to Shanaka "Shan" de Silva, an OSU geologist and co-author on the study. Yet there has been a distinct lack of physical evidence for a pre-cursor eruption at the site of these super-volcanoes.

The model suggests the reason there may be no precursor eruption is that the trigger comes from above, not from within, de Silva pointed out.

"Instead of taking the evidence in these eruptions at face value, most models have simply taken small historic eruptions and tried to scale the process up to super-volcanic proportions," de Silva said. "Those of us who actually study these phenomena have known for a long time that these eruptions are not simply scaled-up Mt. Mazamas or Krakataus -- the scaling is non-linear. The evidence is clear."

It takes a "perfect storm" of conditions to grow an eruptible magma chamber of this size, Gregg says, which is one reason super-volcano eruptions have occurred infrequently throughout history. The magma reservoirs feeding the eruptions could be as large as 10,000- to 15,000-square cubic kilometers, and the chamber requires repeated intrusions of magma from below to heat the surrounding rock and make it malleable. It is that increase in ductility that allows the chamber to grow without magma evacuation in a more conventional manner.

When magma chambers are smaller, they may expel magma before maximum pressure is reached through frequent small eruptions. The Yellowstone eruption is one of the largest super-volcano events in history and it has happened several times. Other super-volcano sites include Lake Toba in Sumatra, the central Andes Mountains, New Zealand and Japan.

Gregg said that despite its explosive history, it doesn't appear that Yellowstone is primed for another super-eruption anytime soon, though the slow process of volcanic uplift is taking place every day.

"The uplift of the surface at Yellowstone right now is on the order of millimeters," she explained. "When the Huckleberry Ridge eruption

took place, the uplift of the whole Yellowstone region would have been hundreds of meters high, and perhaps as much as a kilometer."

Other authors on the investigation include Erik Grosfils, of Pomona College, and John Parmigiani, an OSU engineer.

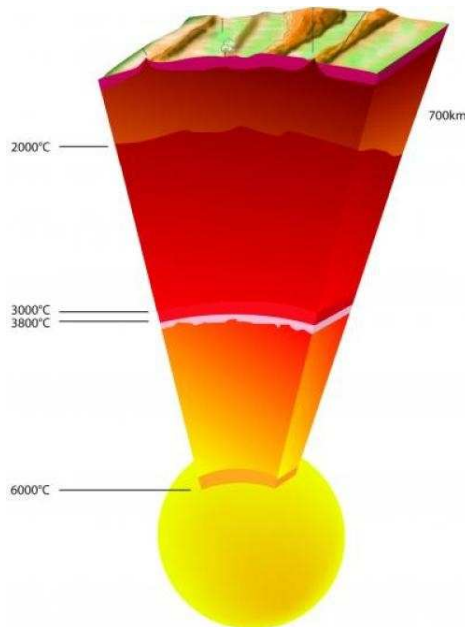
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<http://www.geologyin.com/2014/11/earths-center-is-1000-degrees-hotter.html>

[Earth's center is 1,000 degrees hotter than previously thought](#)



This artist's view depicts the different layers of the Earth and their representative temperatures: crust, upper and lower mantle (brown to red), liquid outer core (orange) and solid inner core (yellow). The pressure at the border between the liquid and the solid core (highlighted) is 3.3 million atmospheres, with a temperature now confirmed as 6000 degrees Celsius.

The research team was led by Agnès Dewaele from the French national technological research organization CEA, alongside members of the French National Center for Scientific Research CNRS and the European Synchrotron Radiation Facility ESRF in Grenoble (France). The Earth's core consists mainly of a sphere of liquid iron at temperatures above 4000 degrees and pressures of more than 1.3 million atmospheres. Under these conditions, iron is as liquid as the water in the oceans. It is only at the very centre of the Earth, where pressure and temperature rise even higher, that the liquid iron solidifies. Analysis of earthquake-triggered seismic waves passing through the Earth, tells us the thickness of the solid and liquid cores, and even how the pressure in the Earth increases with depth. However these waves do not provide information on temperature, which has an important influence on the movement of material within the liquid core and the solid mantle above. Indeed the temperature difference between the mantle and the core is the main driver of large-scale thermal movements, which together with the Earth's rotation, act like a dynamo generating the Earth's magnetic field. The temperature profile through the Earth's interior also underpins geophysical models that explain the creation and intense activity of hot-spot volcanoes like the Hawaiian Islands or La Réunion.

To generate an accurate picture of the temperature profile within the Earth's centre, scientists can look at the melting point of iron at different pressures in the laboratory, using a diamond anvil cell to compress speck-sized samples to pressures of several million atmospheres, and powerful laser beams to heat them to 4000 or even 5000 degrees Celsius. "In practice, many experimental challenges have to be met," explains Agnès Dewaele from CEA, "as the iron sample has to be insulated thermally and also must not be allowed to chemically react with its environment. Even if a sample reaches the extreme temperatures and pressures at the centre of the Earth, it will only do so for a matter of seconds. In this short timeframe it is extremely difficult to determine whether it has started to melt or is still solid."

This is where X-rays come into play. "We have developed a new technique where an intense beam of X-rays from the synchrotron can probe a sample and deduce whether it is solid, liquid or partially molten within as little as a second, using a process known diffraction," says Mohamed Mezouar from the ESRF, "and this is short enough to keep temperature and pressure constant, and at the same time avoid any chemical reactions."

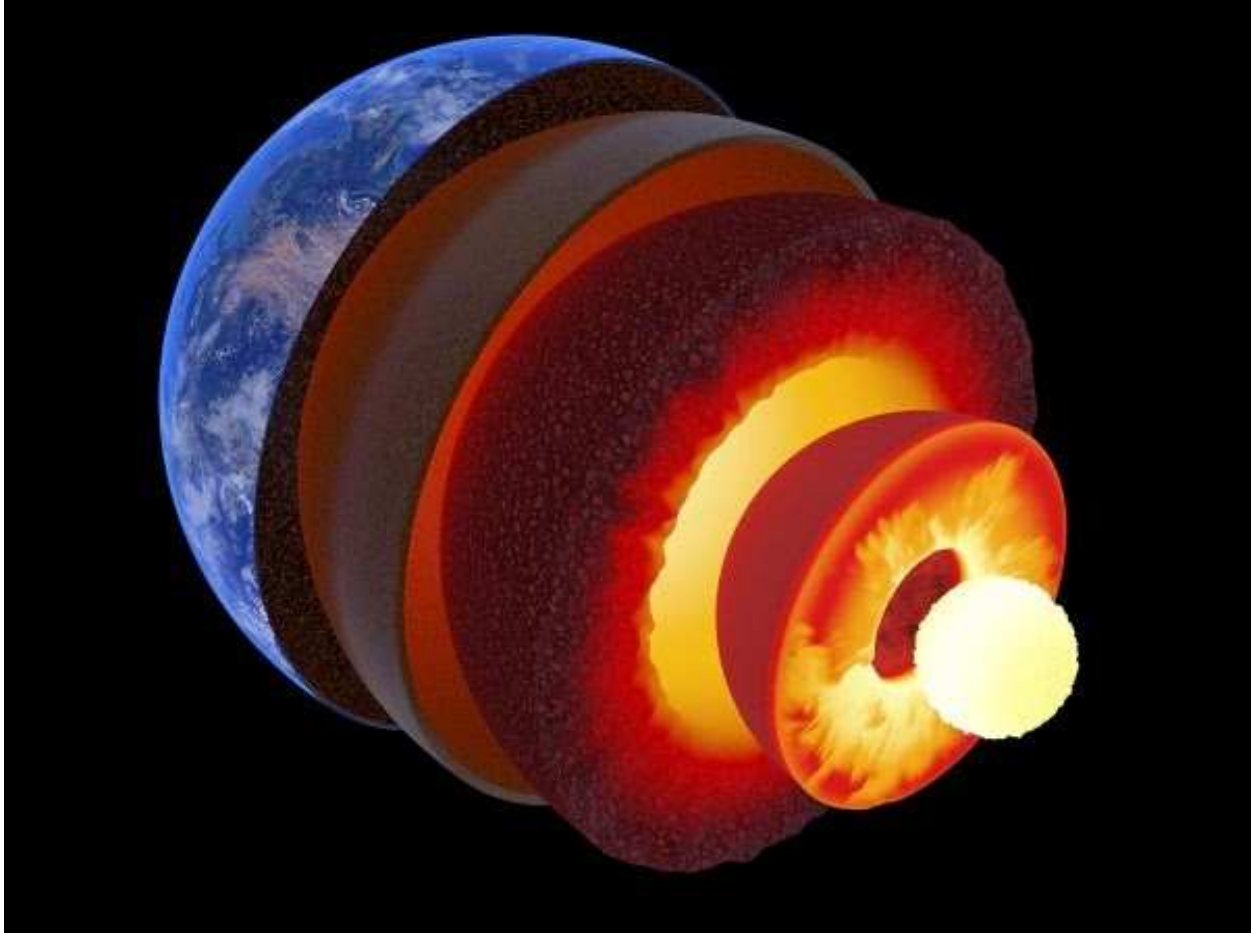
The scientists determined experimentally the melting point of iron up to 4800 degrees Celsius and 2.2 million atmospheres pressure, and then used an extrapolation method to determine that at 3.3 million atmospheres, the pressure at the border between liquid and solid core, the temperature would be 6000 +/- 500 degrees. This extrapolated value could slightly change if iron undergoes an unknown phase transition between the measured and the extrapolated values.

When the scientists scanned the area of pressures and temperatures, they observed why Reinhard Boehler, then at the MPI for Chemistry in Mainz (Germany), had in 1993 published values about 1000 degrees lower. Starting at 2400 degrees, recrystallization effects appear on the surface of the iron samples, leading to dynamic changes of the solid iron's crystalline structure. The experiment twenty years ago used an optical technique to determine whether the samples were solid or molten, and it is highly probable that the observation of recrystallization at the surface was interpreted as melting.

"We are of course very satisfied that our experiment validated today's best theories on heat transfer from the Earth's core and the

generation of the Earth's magnetic field. I am hopeful that in the not-so-distant future, we can reproduce in our laboratories, and investigate with synchrotron X-rays, every state of matter inside the Earth," concludes Agnès Dewaele. The above story is based on [materials](#) provided by **European Synchrotron Radiation Facility**. *Note: Materials may be edited for content and length.* Read more at <http://www.geologyin.com/2014/11/earths-center-is-1000-degrees-hotter.html#WfmosmfytUpumEr1.99>

<http://www.geologyin.com/2014/11/dark-magma-could-explain-mystery.html>
[Dark magma' could explain mystery volcanoes](#)
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The structure of Earth's interior, showing the solid inner core and molten outer core and the surrounding mantle. Hot plumes of rock rise from the base of the mantle and erupt on the surface at hot spots like Iceland. JOHAN SWANEPOEL/ISTOCKPHOTO/THINKSTOCK

The magma fueling the volcanoes of Hawaii and Yellowstone National Park pipes up from deep inside the planet. Scientists have struggled to understand why there are hot spots there, so far from the grinding tectonic plate boundaries at which volcanoes normally appear. New research chalks the mystery up to "dark magma": deep underground pockets of red-hot molten rock that siphon energy from Earth's core.

"It's a very provocative paper ... a bit speculative," says Thomas Duffy, a geoscientist at Princeton University who was not involved with the study. "But it's taking us in an important step on the road to understanding the deep Earth."

Most volcanoes form because tectonic plates, vast sections of Earth's crust, smash against or slide underneath each other. The pushing and melting there feed the volcanoes in the infamous Ring of Fire around the Pacific Ocean. But hot spot–spawned volcanoes like Hawaii's are a different breed. They are nowhere near tectonic plate edges, and yet millions of years ago they spewed out so much lava that they nearly blanketed whole continents with molten rock or covered the globe with soot. Geologists believe the source of this magma is coming from just above Earth's outer core, but they're not exactly sure how.

Alexander Goncharov, a geophysicist at the Carnegie Institution for Science in Washington, D.C., and colleagues think that there are patches of magma—remnants from an early molten stage of our planet's history—quilted around the outer core. Because the bottom of Earth's mantle is nearly 3000 kilometers below the surface—about a 3-day journey if you could drive there by car—temperatures and pressures reach such hellish extremes that the atomic structures of these magmas are different from those they would have at lesser pressures. Duffy says that "can really change physical properties a lot," including the way the material looks and absorbs heat.

To test how magma might behave near the core, Goncharov and his colleagues squeezed a sliver of a dark, opaque glass, made from iron and silicate to mimic the composition of deep Earth magmas, between two diamonds to simulate pressures near the core. The team then shined an infrared light through the glass and measured how much light passed through. As the pressure increased, so did the amount of light the glass absorbed, and the team saw a change in the atomic structure of the glass, the researchers report online today in *Nature Communications*.

Goncharov says that means magmas at high pressures in the lower mantle must be sponging up heat emanating from the core. As these patches of magma around the core get hotter, they start to act as a door for heat to pass into the mantle by convection. The heated mantle rocks then move up through the planet in a massive plume until they erupt on the surface, creating large volcanoes in strange

places like Hawaii, Yellowstone, Easter Island, and Mount Etna, and some of the most violent eruptions. If the team is right, its work could illuminate a key part of Earth's geology. Duffy says these plumes are "one of the most important things to understand," because the movement of heat powers many processes on the planet. For one, Earth's magnetic field depends on how the core spins and flows inside the planet. As a result, Duffy says, "the way heat flows from the core to the mantle could potentially affect the way Earth's magnetic field evolves over time."

Not everybody is ready to get behind Goncharov and his colleagues' new hypothesis. "There are two fundamental limitations of the paper," Duffy says. "First that they're studying a glass and not [melted rock], and there's the fact that [the experiment] is at room temperature and not high temperature." Until scientists perform the experiment with molten rock heated to about 3200°C, Duffy says, they can't be sure how the magma really behaves.

And geologists still contest whether the pockets of magma around Earth's outer core actually exist. To probe Earth's interior, scientists rely on seismic waves from large earthquakes that have to travel through 3000 kilometers of rock. At that depth, the measurements become "a little bit ambiguous," Duffy says. "And there's a question as to why the liquid wouldn't just all drain [away]." Because these dark magma pockets float above the core, it's a bit like imagining an ocean rising tens of kilometers above sea level. "It's not impossible," he says, "but the idea that there's melt in the deep mantle is controversial."

Read more at <http://www.geologyin.com/2014/11/dark-magma-could-explain-mystery.html#VXd4wq0ICkU707TB.99>

<http://www.geologyin.com/2015/01/isotopes-as-tracers-of-magmatic-sources.html>

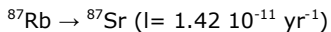
0 Magma, volcano 7:34 PM



I. Rb-Sr isotopes and evolution in course of time

A. Basic equation of the Rb-Sr system

The Rb-Sr (and Sm-Nd) system is somehow more complicated than the U-Pb (on zircon) system, because real rocks and minerals always contain some of the daughter nuclide (D, ^{87}Sr in this case). This problem is overcome by the use of the "isochron" technique that involves the non-radiogenic isotope of Sr, ^{86}Sr (see G214).



^{86}Sr is stable.

Establish the basic isochron equation, which is a relation between $^{87}\text{Sr}/^{86}\text{Sr}$, $(^{87}\text{Sr}/^{86}\text{Sr})_0$ and $^{87}\text{Rb}/^{86}\text{Sr}$ – in yesterday's notation, it's a relation involving N , D and D_0 .

This equation can be used in several ways:

- By building an isochron diagram (as you did last year in G214), i.e. $^{87}\text{Sr}/^{86}\text{Sr} = f(^{87}\text{Rb}/^{86}\text{Sr})$. In this diagram, a suite of cogenetic samples plot along a line, whose slope is a function of the time.
- By building "isotopic evolution diagrams", $^{87}\text{Sr}/^{86}\text{Sr} = f(t)$. In this diagram, a sample evolves along a line of slope = $^{87}\text{Rb}/^{86}\text{Sr}$.

B. Using isotopic evolution diagrams

1. Forward evolution

The primitive mantle has the following isotopic characteristics: its $^{87}\text{Rb}/^{86}\text{Sr}$ ratio is 0.027, and its original (at $T=4.5$ Ga) $^{87}\text{Sr}/^{86}\text{Sr}$ value was 0.699.

Draw the line of evolution of this mantle ("CHondritic Uniform Mantle", or CHUR) from past to present.

At time $T = 3.65$ Ga (that's yesterday's sample...), the mantle melted and produced a magma which eventually cooled into a rock of $^{87}\text{Rb}/^{86}\text{Sr} = 0.15$.

Draw its line of evolution. What is the present-day $^{87}\text{Sr}/^{86}\text{Sr}$ of this sample?

Now consider a sediment formed at 3.2 Ga from this rock, with a $^{87}\text{Rb}/^{86}\text{Sr}$ of 0.25.

Draw its line of evolution.

2. From present to past

Now plot on your previous diagram a granitic sample with present-day values as follows, and draw its evolution line back into the past.

$^{87}\text{Rb}/^{86}\text{Sr}$	$^{87}\text{Sr}/^{86}\text{Sr}$
0.35	0.7145

This rock formed at 2.0 Ga.

1. What was its $^{87}\text{Sr}/^{86}\text{Sr}$ at this time? (i.e., original Sr value).

2. Among the 3 rocks plotted above, what is its most likely source (i.e., the rock that melted to form the granitic magma)
3. If that rock was a pure product from the mantle, what would be its age?

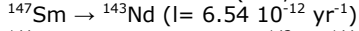
This "pseudo-age" is often referred to as a " T_{CHUR} ".

Note that, as rock "evolves" by successive melting or erosion event, they "move" to higher $^{87}\text{Rb}/^{86}\text{Sr}$ ratios – i.e. to rock that are richer in Rb. This is because Rb is, in general, a more incompatible elements than Sr and therefore it is more readily concentrated in the melts.

II. Various isotopic tracers

A. Sm-Nd system

The isochron method (and, consequently, the use of initial ratios) can be used for many other systems, e.g.



^{144}Nd is stable; the ratio $^{143}\text{Nd}/^{144}\text{Nd}$ can be used to interpret rock sources.

This ratio has a very restricted range of variation; therefore, the "e" notation is commonly used. It works just like the d for O isotopes (G214), by calculating the deviation from a standard, except that an e unit is 10^{-4} , whereas a d unit is 10^{-3} difference with the standard. The standard for Nd isotopes is commonly the "CHUR", or CHondritic Uniform Reservoir:

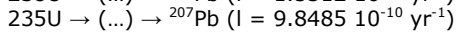
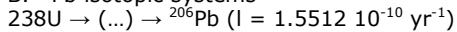
$$\epsilon_{Nd} = \left(\frac{(^{143}\text{Nd}/^{144}\text{Nd})_{\text{sample}}}{(^{143}\text{Nd}/^{144}\text{Nd})_{\text{CHUR}}} - 1 \right) \times 10,000$$

Typical variations for ϵ_{Nd} are between -10 and +10.

Note that, for Sm-Nd system, more "evolved" rocks have lower $^{147}\text{Sm}/^{144}\text{Nd}$ values than more "primitive" rocks: in other terms, they evolve "under" the CHUR line instead of above as previously.

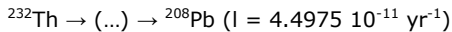
1. Plot a (quantitative) Sm-Nd evolution diagram for the mantle, and for a more evolved sample (as we did above).
2. Indicate on the graph what ϵ_{Nd} represents.

B. Pb isotopic systems



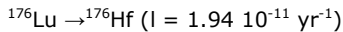
(yes, the same systems we looked at yesterday –but they're not used in the same way here ! And yes, it is possible to get isochron ages from any of the two systems, without needing the Concordia method).

^{204}Pb is stable in both case; $^{206}\text{Pb}/^{204}\text{Pb}$ and $^{207}\text{Pb}/^{204}\text{Pb}$ are therefore used as tracers.



^{204}Pb is stable again; $^{208}\text{Pb}/^{204}\text{Pb}$ is yet another tracer.

C. Other systems

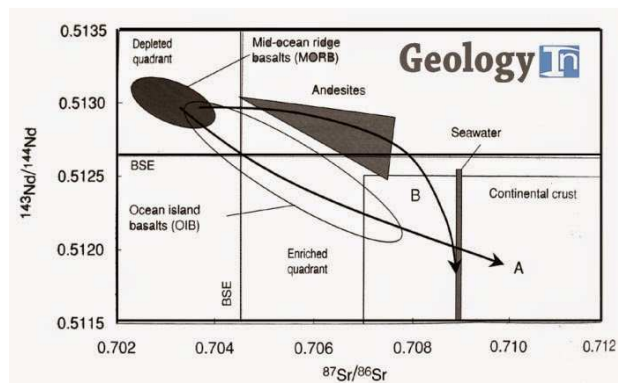


(^{178}Hf stable, $^{176}\text{Hf}/^{178}\text{Hf}$ or ϵ_{Hf})

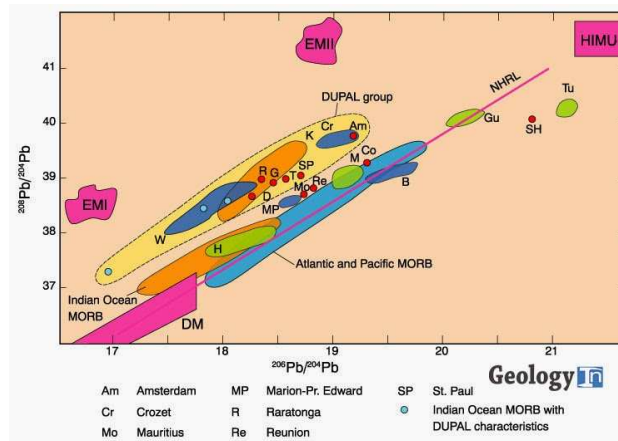
D. Isotopic characteristic of Earth's reservoirs

Empirically determined. Different part of the Earth appear to have different characteristics. Two example:

- Mantle/crust difference. Clearly seen using Sr-Nd diagrams.



- Differences within the mantle itself, reflected in the chemistry of erupted lava. Mostly seen with the various Pb isotopes. It appears that there is a geographic logic behind this (why??)



Read more at <http://www.geologyin.com/2015/01/isotopes-as-tracers-of-magmatic-sources.html#WDEY4TJWATdRbZ19.99>

NEWS METEORITICA DA SEMANA

<http://www.geologyin.com/2015/01/study-casts-doubt-on-mammoth-killing.html>

[Study casts doubt on mammoth-killing cosmic impact](#)

[1 dinosaur](#) 8:16 PM



Large asteroid hitting Earth (stock illustration).

The Younger Dryas lasted a thousand years and coincided with the extinction of mammoths and other great beasts and the disappearance of the Paleo-Indian Clovis people. In the 1980s, some researchers put forward the idea that the cool period, which fell between two major glaciations, began when a comet or meteorite struck North America.

In the new study, published online in the *Journal of Archaeological Science*, scientists analyzed siliceous scoria droplets -- porous granules associated with melting -- from four sites in northern Syria dating back 10,000 to 13,000 years ago. They compared them to similar scoria droplets previously suggested to be the result of a cosmic impact at the onset of the Younger Dryas.

"For the Syria side, the impact theory is out," said lead author Peter Thy, a project scientist in the UC Davis Department of Earth and Planetary Sciences. "There's no way that can be done."

The findings supporting that conclusion include:

- The composition of the scoria droplets was related to the local soil, not to soil from other continents, as one would expect from an intercontinental impact.
- The texture of the droplets, thermodynamic modeling and other analyses showed the droplets were formed by short-lived heating events of modest temperatures, and not by the intense, high temperatures expected from a large impact event.
- And in a key finding, the samples collected from archaeological sites spanned 3,000 years. "If there was one cosmic impact," Thy said, "they should be connected by one date and not a period of 3,000 years."

So if not resulting from a cosmic impact, where did the scoria droplets come from? House fires. The study area of Syria was associated with early agricultural settlements along the Euphrates River. Most of the locations include mud-brick structures, some of which show signs of intense fire and melting. The study concludes that the scoria formed when fires ripped through buildings made of a mix of local soil and straw.

The above story is based on [materials](#) provided by **University of California - Davis**. *Note: Materials may be edited for content and length.*

Read more at <http://www.geologyin.com/2015/01/study-casts-doubt-on-mammoth-killing.html#jwCLMEIrrAq8gCbM.99>

<http://www.geologyin.com/2015/01/rare-rock-with-30000-diamonds-examined.html>

[Rare rock with 30,000 diamonds examined](#) <http://www.geologyin.com/2015/01/isotopes-as-tracers-of-magmatic-sources.html>



The golf-ball sized chunk of rock contains more than 30,000 diamonds, each less than a millimeter in size (rendering them worthless), along with speckles of red and green garnet and other minerals.

The rock was found in Russia's Udachnaya diamond mine in northern Siberia. The diamond company of Russia, ALROSA, loaned it to Earth and Planetary Sciences Professor Larry Taylor and a team of researchers from the Russian Academy of Sciences so they could study the rock to uncover the diamonds' genesis.

Scientists believe that diamonds form at some 100 miles deep in Earth's mantle and are carried to the surface by special volcanic eruptions. However, most mantle rocks crumble during this journey. This rock is one of only a few hundred recovered in which the diamonds are still in their original setting from within the Earth.

"It is a wonder why this rock has more than 30,000 perfect teeny tiny octahedral diamonds -- all 10 to 700 micron in size and none larger," said Taylor. "Diamonds never nucleate so homogeneously as this. Normally, they do so in only a few selective places and grow larger. It's like they didn't have time to coalesce into larger crystals."

Taylor and his colleagues examined the sparkly chunk using a giant X-ray machine to study the diamonds and their relationships with associated materials. They also beamed electrons at the materials inside the diamonds -- called inclusions -- to study the chemicals trapped inside.

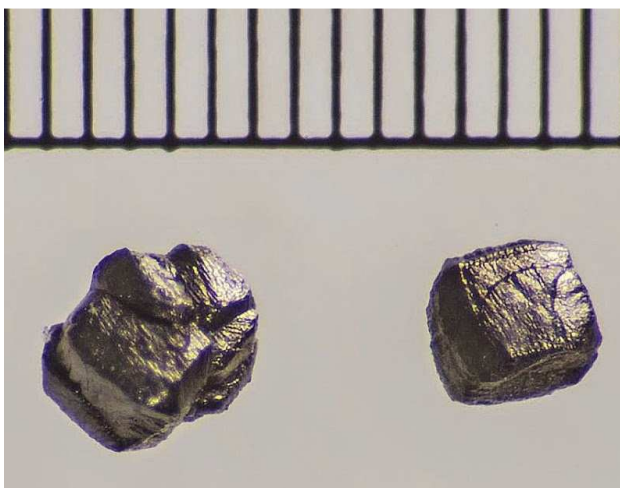
This created two- and three-dimensional images which revealed a relationship between minerals. Analyses of nitrogen indicated the diamonds were formed at higher-than-normal temperatures over longer-than-normal times. The images also showed abnormal carbon isotopes for this type of rock, indicating it was originally formed as part of the crust of Earth, withdrawn by tectonic shifts and transformed into the shimmery rock we see today.

"These are all new and exciting results, demonstrating evidences for the birth mechanism of diamonds in this rock and diamonds in general," said Taylor. The findings were presented at the American Geophysical Union's annual conference in San Francisco in December and will be published in a special issue of *Russian Geology and Geophysics* this month.

The above story is based on [materials](#) provided by [University of Tennessee at Knoxville](#). Note: Materials may be edited for content and length.

<http://www.geologyin.com/2014/12/asteroid-impacts-on-earth-make.html>

[Asteroid impacts on Earth make structurally bizarre diamonds](#)



Diamond grains from the Canyon Diablo meteorite are shown. The tick marks are spaced one-fifth of a millimeter (200 microns) apart. - Arizona State University/Laurence Garvie

The scientists' report is published in *Nature Communications*, Nov. 20, by Péter Németh, a former ASU visiting researcher (now with the Research Centre of Natural Sciences of the Hungarian Academy of Sciences), together with ASU's Laurence Garvie, Toshihiro Aoki and Peter Buseck, plus Natalia Dubrovinskaia and Leonid Dubrovinsky from the University of Bayreuth in Germany. Buseck and Garvie are with ASU's School of Earth and Space Exploration, while Aoki is with ASU's LeRoy Eyring Center for Solid State Science.

"So-called lonsdaleite is actually the long-familiar cubic form of diamond, but it's full of defects," says Péter Németh. These can occur, he explains, due to shock metamorphism, plastic deformation or unequilibrated crystal growth.

The lonsdaleite story began almost 50 years ago. Scientists reported that a large meteorite, called Canyon Diablo after the crater it formed on impact in northern Arizona, contained a new form of diamond with a hexagonal structure. They described it as an impact-related mineral and called it lonsdaleite, after Dame Kathleen Lonsdale, a famous crystallographer.

Since then, "lonsdaleite" has been widely used by scientists as an indicator of ancient asteroidal impacts on Earth, including those linked to mass extinctions. In addition, it has been thought to have mechanical properties superior to ordinary diamond, giving it high potential

industrial significance. All this focused much interest on the mineral, although pure crystals of it, even tiny ones, have never been found or synthesized. That posed a long-standing puzzle.

The ASU scientists approached the question by re-examining Canyon Diablo diamonds and investigating laboratory samples prepared under conditions in which lonsdaleite has been reported.

Using the advanced electron microscopes in ASU's Center for Solid State Science, the team discovered, both in the Canyon Diablo and the synthetic samples, new types of diamond twins and nanometer-scale structural complexity. These give rise to features attributed to lonsdaleite.

"Most crystals have regular repeating structures, much like the bricks in a well-built wall," says Peter Buseck. However, interruptions can occur in the regularity, and these are called defects. "Defects are intermixed with the normal diamond structure, just as if the wall had an occasional half-brick or longer brick or row of bricks that's slightly displaced to one side or another."

The outcome of the new work is that so-called lonsdaleite is the same as the regular cubic form of diamond, but it has been subjected to shock or pressure that caused defects within the crystal structure.

One consequence of the new work is that many scientific studies based on the presumption that lonsdaleite is a separate type of diamond need to be re-examined. The study implies that both shock and static compression can produce an intensely defective diamond structure.

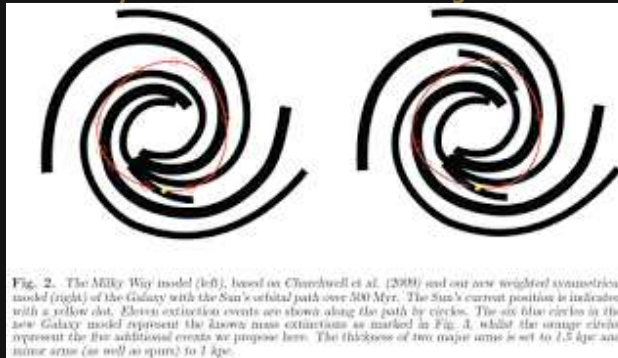
The new discovery also suggests that the observed structural complexity of the Canyon Diablo diamond results in interesting mechanical properties. It could be a candidate for a product with exceptional hardness.

The above story is based on [materials](#) provided by [Arizona State University](#). *Note: Materials may be edited for content and length.*

Read more at <http://www.geologyin.com/2014/12/asteroid-impacts-on-earth-make.html#6ESdO6YPKZk8rdWs.99>

<http://thedragonstales.blogspot.com.br/2013/09/some-astronomers-wont-give-up.html>

Some Astronomers Won't Give Up: Periodicity & Mass Extinctions Rides Again



Mass Extinction And The Structure Of The Milky Way

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Abstract:

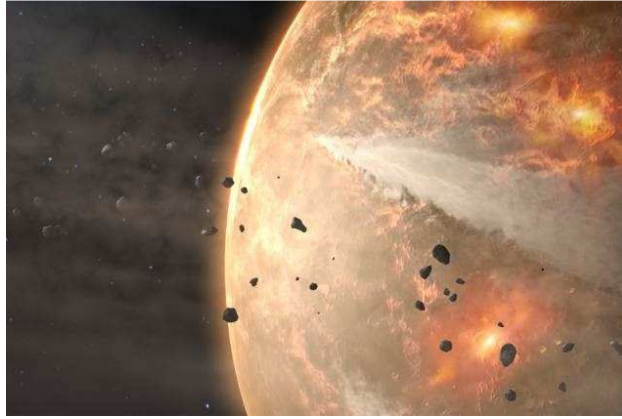
We use the most up to date Milky Way model and solar orbit data in order to test the hypothesis that the Sun's galactic spiral arm crossings cause mass extinction events on Earth. To do this, we created a new model of the Milky Way's spiral arms by combining a large quantity of data from several surveys. We then combined this model with a recently derived solution for the solar orbit to determine the timing of the Sun's historical passages through the Galaxy's spiral arms. Our new model was designed with a symmetrical appearance, with the major alteration being the addition of a spur at the far side of the Galaxy. A correlation was found between the times at which the Sun crosses the spiral arms and six known mass extinction events. Furthermore, we identify five additional historical mass extinction events that might be explained by the motion of the Sun around our Galaxy. These five additional significant drops in marine genera that we find include significant reductions in diversity at 415, 322, 300, 145 and 33 Myr ago. Our simulations indicate that the Sun has spent ~60% of its time passing through our Galaxy's various spiral arms. Also, we briefly discuss and combine previous work on the Galactic Habitable Zone with the new Milky Way model.

The problem with periodicity is the extinctions in question often have wildly disparate basal causes. Periodicity requires a single driver which is extraterrestrial in nature. Exceedingly few of these look like that is even a remote possibility: especially the Eocene.

Posted by Will Baird at [1:00 PM](#)

<http://www.geologypage.com/2014/12/losing-airnew-study-finds-barrage-of.html>

Losing airnew study finds barrage of small impacts likely erased much of the Earth's primordial atmosphere



Today's atmosphere likely bears little trace of its primordial self: Geochemical evidence suggests that Earth's atmosphere may have been completely obliterated at least twice since its formation more than 4 billion years ago.

Credit: Image courtesy of NASA

Today's atmosphere likely bears little trace of its primordial self: Geochemical evidence suggests that Earth's atmosphere may have been completely obliterated at least twice since its formation more than 4 billion years ago. However, it's unclear what interplanetary forces could have driven such a dramatic loss.

Now researchers at MIT, Hebrew University, and Caltech have landed on a likely scenario: A relentless blitz of small space rocks, or planetesimals, may have bombarded Earth around the time the moon was formed, kicking up clouds of gas with enough force to permanently eject small portions of the atmosphere into space.

Tens of thousands of such small impacts, the researchers calculate, could efficiently jettison Earth's entire primordial atmosphere. Such impacts may have also blasted other planets, and even peeled away the atmospheres of Venus and Mars.

In fact, the researchers found that small planetesimals may be much more effective than giant impactors in driving atmospheric loss. Based on their calculations, it would take a giant impact -- almost as massive as Earth slamming into itself -- to disperse most of the atmosphere. But taken together, many small impacts would have the same effect, at a tiny fraction of the mass.

Hilke Schlichting, an assistant professor in MIT's Department of Earth, Atmospheric and Planetary Sciences, says understanding the drivers of Earth's ancient atmosphere may help scientists to identify the early planetary conditions that encouraged life to form.

"[This finding] sets a very different initial condition for what the early Earth's atmosphere was most likely like," Schlichting says. "It gives us a new starting point for trying to understand what was the composition of the atmosphere, and what were the conditions for developing life."

Schlichting and her colleagues have published their results in the journal *Icarus*.

Efficient ejection

The group examined how much atmosphere was retained and lost following impacts with giant, Mars-sized and larger bodies and with smaller impactors measuring 25 kilometers or less -- space rocks equivalent to those whizzing around the asteroid belt today.

The team performed numerical analyses, calculating the force generated by a given impacting mass at a certain velocity, and the resulting loss of atmospheric gases. A collision with an impactor as massive as Mars, the researchers found, would generate a shockwave through Earth's interior, setting off significant ground motion -- similar to simultaneous giant earthquakes around the planet -- whose force would ripple out into the atmosphere, a process that could potentially eject a significant fraction, if not all, of the planet's atmosphere.

However, if such a giant collision occurred, it should also melt everything within the planet, turning its interior into a homogenous slurry. Given the diversity of noble gases like helium-3 deep inside Earth today, the researchers concluded that it is unlikely that such a giant, core-melting impact occurred.

Instead, the team calculated the effects of much smaller impactors on Earth's atmosphere. Such space rocks, upon impact, would generate an explosion of sorts, releasing a plume of debris and gas. The largest of these impactors would be forceful enough to eject all gas from the atmosphere immediately above the impact's tangent plane -- the line perpendicular to the impactor's trajectory. Only a fraction of this atmosphere would be lost following smaller impacts.

To completely eject all of Earth's atmosphere, the team estimated, the planet would need to have been bombarded by tens of thousands of small impactors -- a scenario that likely did occur 4.5 billion years ago, during a time when the moon was formed. This period was one of galactic chaos, as hundreds of thousands of space rocks whirled around the solar system, frequently colliding to form the planets, the moon, and other bodies.

"For sure, we did have all these smaller impactors back then," Schlichting says. "One small impact cannot get rid of most of the atmosphere, but collectively, they're much more efficient than giant impacts, and could easily eject all the Earth's atmosphere."

Runaway effect

However, Schlichting realized that the sum effect of small impacts may be too efficient at driving atmospheric loss. Other scientists have measured the atmospheric composition of Earth compared with Venus and Mars. These measurements have revealed that while each planetary atmosphere has similar patterns of noble gas abundance, the budget for Venus is similar to that of chondrites -- stony meteorites that are primordial leftovers of the early solar system. Compared with Venus, Earth's noble gas budget has been depleted 100-fold.

Schlichting realized that if both planets were exposed to the same blitz of small impactors, Venus' atmosphere should have been similarly depleted. She and her colleagues went back over the small-impactor scenario, examining the effects of atmospheric loss in more detail, to try and account for the difference between the two planets' atmospheres.

Based on further calculations, the team identified an interesting effect: Once half a planet's atmosphere has been lost, it becomes much easier for small impactors to eject the rest of the gas. The researchers calculated that Venus' atmosphere would only have to start out slightly more massive than Earth's in order for small impactors to erode the first half of the Earth's atmosphere, while keeping Venus' intact. From that point, Schlichting describes the phenomenon as a "runaway process -- once you manage to get rid of the first half, the second half is even easier."

Time zero

During the course of the group's research, an inevitable question arose: What eventually replaced Earth's atmosphere? Upon further calculations, Schlichting and her team found the same impactors that ejected gas also may have introduced new gases, or volatiles. "When an impact happens, it melts the planetesimal, and its volatiles can go into the atmosphere," Schlichting says. "They not only can deplete, but replenish part of the atmosphere."

The group calculated the amount of volatiles that may be released by a rock of a given composition and mass, and found that a significant portion of the atmosphere may have been replenished by the impact of tens of thousands of space rocks.

"Our numbers are realistic, given what we know about the volatile content of the different rocks we have," Schlichting notes.

Jay Melosh, a professor of earth, atmospheric, and planetary sciences at Purdue University, says Schlichting's conclusion is a surprising one, as most scientists have assumed Earth's atmosphere was obliterated by a single, giant impact. Other theories, he says, invoke a strong flux of ultraviolet radiation from the sun, as well as an "unusually active solar wind."

"How the Earth lost its primordial atmosphere has been a longstanding problem, and this paper goes a long way toward solving this enigma," says Melosh, who did not contribute to the research. "Life got started on Earth about this time, and so answering the question about how the atmosphere was lost tells us about what might have kicked off the origin of life."

Going forward, Schlichting hopes to examine more closely the conditions underlying Earth's early formation, including the interplay between the release of volatiles from small impactors and from Earth's ancient magma ocean.

"We want to connect these geophysical processes to determine what was the most likely composition of the atmosphere at time zero, when the Earth just formed, and hopefully identify conditions for the evolution of life," Schlichting says.

Reference:

Hilke E. Schlichting, Re'em Sari, Almog Yalinewich. Atmospheric mass loss during planet formation: The importance of planetesimal impacts. *Icarus*, 2015; 247: 81 DOI: [10.1016/j.icarus.2014.09.053](https://doi.org/10.1016/j.icarus.2014.09.053)

Note : The above story is based on materials provided by Massachusetts Institute of Technology. The original article was written by Jennifer Chu.

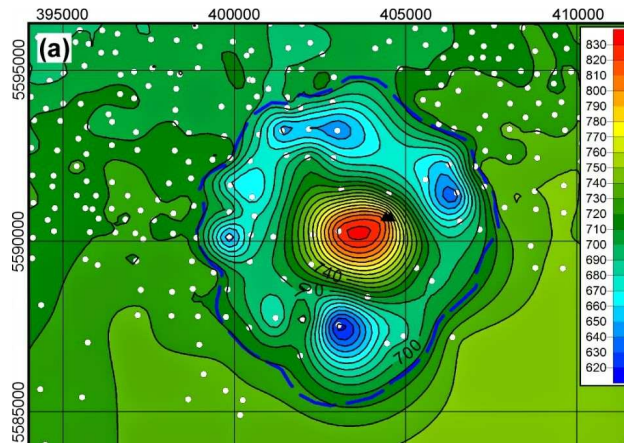
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[Ancient crater points to massive meteorite strike](#)

[O Meteorite, News 8:02 PM](#)



This is a map showing the structure and contour of the Bow City crater. Color variation shows meters above sea level.

Read more at <http://www.geologyin.com/2014/12/ancient-crater-points-to-massive.html#XPYuUf0rXtyEuVO3.99>

The first hints about the impact site near the southern Alberta hamlet of Bow City were discovered by a geologist with the Alberta Geological Survey and studied by a U of A team led by Doug Schmitt, Canada Research Chair in Rock Physics.

Time and glaciers have buried and eroded much of the evidence, making it impossible at this point to say with full certainty the ring-like structure was caused by a meteorite impact, but that's what seismic and geological evidence strongly suggests, said Schmitt, a professor in the Faculty of Science and co-author of a new paper about the discovery.

"We know that the impact occurred within the last 70 million years, and in that time about 1.5 km of sediment has been eroded. That makes it really hard to pin down and actually date the impact."

Erosion has worn away all but the "roots" of the crater, leaving a semicircular depression eight kilometres across with a central peak. Schmitt says that when it formed, the crater likely reached a depth of 1.6 to 2.4 km -- the kind of impact his graduate student Wei Xie calculated would have had devastating consequences for life in the area.

"An impact of this magnitude would kill everything for quite a distance," he said. "If it happened today, Calgary (200 km to the northwest) would be completely fried and in Edmonton (500 km northwest), every window would have been blown out. Something of that size, throwing that much debris in the air, potentially would have global consequences; there could have been ramifications for decades."

The impact site was first discovered in 2009 by geologist Paul Glombick, who at the time was working on a geological map of the area for the Alberta Geological Survey. Glombick relied on existing geophysical log data from the oil and gas industry when he discovered a bowl-shaped structure.

The Alberta Geological Survey contacted the U of A and Schmitt to explore further, peeking into Earth by analyzing seismic data donated by industry. Schmitt's student, Todd Brown, later confirmed a crater-like structure.

Read more at <http://www.geologyin.com/2014/12/ancient-crater-points-to-massive.html#XPYuUf0rXtyEuVO3.99>

AMBIENTE BRASIL

09 / 01 / 2015 [Egito anuncia descoberta de castelos militares do Império Médio](#)

Entre estes castelos, situados na região de Tel Habua, na província de Ismailia, estão os que formam a chamada "Muralha do Emir", mencionada com frequência nos livros da história do Antigo Egito.

09 / 01 / 2015 [Policiais flagram desmatamento de mangue no interior de Sergipe](#)

Após denúncias do Ministério Público Estadual, os agentes identificaram atividades de carcinicultura - criação de camarões feita em pequenos reservatórios - em uma propriedade rural.

09 / 01 / 2015 [Testes finais de vacina contra Ebola terão início em janeiro ou fevereiro](#)

OMS anunciou prazo após reunião com fabricantes e ministérios da Saúde. Caso sejam eficazes, injeções estarão disponíveis poucos meses depois.

09 / 01 / 2015 [Governo do Acre discute plano de ação para enchentes de rios](#)

O objetivo é constituir uma força-tarefa para lidar com os desafios e danos ocasionados pelas cheias.

09 / 01 / 2015 [Com 330 casos em três meses, Porto Ferreira/SP enfrenta epidemia de dengue](#)

200 notificações foram feitas em oito dias deste ano, segundo vigilância. Cidade começa a fazer arrastões em bairros a partir deste sábado (10).

09 / 01 / 2015 [SpaceX tentará no sábado pousar foguete sobre plataforma flutuante](#)

A SpaceX, que está fazendo esforços por reutilizar os foguetes usados para levar as naves à ISS, adiou o lançamento na última hora de terça-feira devido a uma anomalia no segundo estágio do Falcon 9.

09 / 01 / 2015 [Vaticano vai destinar 3 milhões de euros para combater ebola na África](#)

Verba vai principalmente para Guiné, Libéria e Serra Leoa. Vírus matou 8.235 pessoas, de um total de 20.747 casos conhecidos.

09 / 01 / 2015 [Governo vai rever inclusão de peixes na lista de espécies em extinção](#)

A lista foi questionada por entidades do setor pesqueiro e provocou protestos como o bloqueio da circulação de navios um porto em Santa Catarina.

09 / 01 / 2015 [Chuva de granizo atinge Cascavel/PR e temperatura cai cerca de 9° C](#)

Temporal caiu no fim da tarde desta quinta-feira (8) e causou estragos. Segundo Simepar, previsão é de mais chuva com temperaturas altas.

09 / 01 / 2015 [Brasil teve 587,8 mil casos de dengue em 2014; queda foi de 59% ante 2013](#)

Também houve queda de 40% no número de mortes pela doença. Brasil já teve 2.258 casos de infecção pelo vírus chikungunya.

09 / 01 / 2015 [Adição de 1 segundo em 2015 pode atrapalhar serviços de internet](#)

Dia 30 de junho terá 86.401 segundos; último acréscimo foi feito em 2012. Parte dos sistemas computacionais não 'sabem' lidar com segundo extra.

09 / 01 / 2015 [Bill Gates investe em máquina que extrai água potável de fezes humanas](#)

Equipamento pode gerar 85 mil litros de água, além de eletricidade. Primeiro protótipo está funcionando nos EUA e será enviado para Senegal.

09 / 01 / 2015 [Sedimentos encontrados em Marte podem ser prova de vida](#)

As imagens reveladas por cientistas demonstram a presença de sedimentos que, na Terra, são formados por micróbios.

09 / 01 / 2015 [Recipientes de isopor passam a ser proibidos em Nova York/EUA](#)

Nova York se junta a outras 70 cidades dos Estados Unidos que adotaram uma medida parecida.

09 / 01 / 2015 [Cientistas americanos desenvolvem antibiótico 'revolucionário'](#)

Em testes feitos em ratos de laboratório, medicamento foi eficaz no combate a bactérias resistentes a antibióticos atuais.

09 / 01 / 2015 Poá/SP decreta situação de emergência por causa da chuva

Objetivo é de mobilizar os órgãos municipais na reabilitação da cidade. Temporal do dia 29 de dezembro também causou estragos em Ferraz.

08 / 01 / 2015 2014 foi o mais seco dos últimos 32 anos no sistema Cantareira, em SP

Formado em 1974, o Cantareira conta com cinco represas e abastece 6,2 milhões de pessoas nas regiões de São Paulo e Campinas. A Sabesp começou a coletar e sistematizar dados sobre chuva na forma atual em 1983.

08 / 01 / 2015 Desastres naturais de 2014 foram menos destrutivos, afirma seguradora

Catástrofes provocaram menos mortes e danos materiais em 30 anos. Dados de 2014 'não permitem criar a ilusão de segurança', diz relatório.

08 / 01 / 2015 Vacas 'nazistas' são sacrificadas em fazenda britânica

Animais de cruzamento experimental feito por cientistas de Hitler atacaram funcionários de proprietário de terras no sul da Inglaterra.

08 / 01 / 2015 Escultura incomum de mais de 2.300 anos é descoberta no Egito

Arqueólogos suecos descobriram no Egito uma escultura mural pouco comum de mais de 2.300 anos representando o deus sol Amon-Rá e o deus escriba Tot, informou o ministério das Antiguidades.

08 / 01 / 2015 OMS diz que há sinais de estabilidade nos casos de ebola em Serra Leoa

Epidemia matou 8.235 pessoas, de um total de 20.747 infectados. Apesar de estabilização, Serra Leoa ainda é o mais afetado no momento.

08 / 01 / 2015 Moradores da Ilha de Páscoa teriam morrido após chegada dos europeus

Os cientistas acreditam que a sociedade pré-histórica Rapa Nui, como são conhecidos os moradores da ilha, desmoronou por causa de séculos de crescimento populacional descontrolado que causou o desmatamento da região.

08 / 01 / 2015 'Cápsula do tempo' de 220 anos é aberta nos EUA e conteúdo surpreende pesquisadores

Caixa foi deixada por heróis da independência americana com moedas, jornais e uma placa de prata.

08 / 01 / 2015 ONG é inundada com ofertas de ajuda para cão abandonado em estação

Kai foi encontrado na sexta-feira com uma mala que continha seus pertences.

08 / 01 / 2015 Terra-alien está entre 8 novos planetas habitáveis descobertos

Todos os planetas foram vistos pelo telescópio espacial Kepler, da Nasa. Assim, o registro de tais "exoplanetas" passou de mil. Mas apenas três deles estão com segurança dentro da "zona habitável" de sua estrela-mãe - e um em particular é rochoso, como a Terra, e apenas um pouco mais quente.

08 / 01 / 2015 Novo antibiótico destrói bactérias e impede que desenvolvam resistência

Resistência de bactérias a antibióticos é problema para saúde pública. Teixobactin tem vários alvos, por isso resistência deve demorar a surgir.

08 / 01 / 2015 Conta Verde estimula usuário a compensar emissões pelo consumo de energia

O Conta Verde, como está sendo chamado no Ceará, faz parte do programa Ecoelce, que estimula a troca de material reciclável por descontos nas contas de energia.

08 / 01 / 2015 São Paulo terá novo modelo de sacola de supermercado a partir de fevereiro

As novas sacolas de supermercado, verdes e maiores que as tradicionais, serão feitas com material renovável e poderão ser usadas somente para descarte do lixo reciclável. Quem usar a sacola padronizada para descartar lixo orgânico, poderá ser advertido e até multado.

08 / 01 / 2015 Estudo liga atividade solar ao nascer à expectativa de vida

Quem vem ao mundo durante calmaria solar tem chance de viver mais. Pesquisadores compararam dados demográficos de noruegueses.

08 / 01 / 2015 Peixes-boi reabilitados serão soltos em ambiente natural no Amazonas

Os animais estão sob os cuidados da equipe do Instituto Mamirauá e moradores de comunidades ribeirinhas, no Centro de Reabilitação de Peixe-Boi Amazônico de Base Comunitária, o "Centrinho", localizado na Reserva de Desenvolvimento Sustentável Amanã, território do município de Maraã (AM).

08 / 01 / 2015 Farmacêutica faz primeiro teste em humanos de vacina contra ebola

O grupo farmacêutico americano Johnson & Johnson já produziu mais de 400.000 doses da vacina e prevê fabricar 2 milhões este ano, o que significa uma aceleração do cronograma anunciado em outubro.

07 / 01 / 2015 Planeta parecido com a Terra seria habitat ideal para aliens

Kepler 438B é um pouco maior que a Terra e recebe cerca de 40% mais de calor que o nosso planeta recebe do sol.

07 / 01 / 2015 Sobre cometa, robô Philae deve despertar novamente em março

Módulo espacial foi lançado pela Sonda Rosetta em novembro passado. Cometa deve chegar mais perto do Sol e recarregar baterias da Philae.

07 / 01 / 2015 Cães que virariam comida na Coreia do Sul chegam aos EUA para adoção

Cães foram resgatados de fazenda que os criava para consumo humano. Fazendeiro sul-coreano recebeu compensação e passará a cultivar mirtilos.

07 / 01 / 2015 Astrônomos calculam idade de estrelas a partir da velocidade de rotação

Pesquisadores conseguiram reduzir margem de erro de 100% para 10%.

07 / 01 / 2015 Ebola já matou mais de 8,1 mil pessoas na África Ocidental

Quase todos os casos de infecção e mortos foram registrados nos três países mais afetados: Serra Leoa, Libéria e Guiné-Conacri.

07 / 01 / 2015 Japão proíbe entrada de 11 ecologistas da Sea Shepherd

Os ativistas da Sea Shepherd têm boicotado regularmente as campanhas de caça a baleias e a golfinhos, que todos os anos ocorrem na localidade de Taiji, em Wakayam.

07 / 01 / 2015 Sistema Cantareira tem nova queda e chega a 6,9% da capacidade

Nos primeiros seis dias do mês foram registrados 15 milímetros (mm) de chuva nas cabeceiras do sistema. A média histórica do mês é 271,1mm.

07 / 01 / 2015 Tunas do Paraná registra tremor de terra

Abalo sísmico marcou 3.1 na escala Richter e durou menos de um minuto. O tremor não causou estragos, mas assustou a cidade.

07 / 01 / 2015 Libéria quer reabrir escolas em fevereiro após controlar o ebola

Surto já matou mais de 3.400 pessoas no país da África Ocidental. Escolas serão reabertas em 2 de fevereiro, mas se sabem quantas unidades.

07 / 01 / 2015 Eucaliptos centenários em Friburgo/RJ serão cortados e podados

Decisão do município foi anunciada nesta terça-feira (6). Operação acontecerá nos finais de semana, das 7h às 17h.

07 / 01 / 2015 Raio mata dois trabalhadores rurais na Grande São Paulo

Homens trabalhavam em Embu-Guaçu quando temporal começou. Eles tentaram se abrigar, mas foram atingidos; outros dois se feriram.

07 / 01 / 2015 Secretaria paulista de Saúde confirma morte por dengue em Catanduva

No ano passado, Catanduva registrou 322 casos de dengue na cidade. Em 2013 ocorreram 726 casos de dengue, sem registro de morte.

07 / 01 / 2015 Japão retoma pesquisa sobre baleias na Antártica mas sem capturá-las

Estudos não letais são de observação e extração de amostras de pele. País renunciou à caça de baleias após sentença em Tribunal Internacional.

07 / 01 / 2015 Exemplar de puma morre após ser atingido por carro nos EUA

Felino foi atropelado em estrada dos arredores de São Francisco, Califórnia. Animal vive em áreas altas e é chamado também de leão-da-montanha.

07 / 01 / 2015 Lançamento de foguete é cancelado 'em cima da hora' nos EUA SpaceX planeja usar o propulsor descartado pelo foguete para um teste sem precedentes.

06 / 01 / 2015 Sul da Flórida está vulnerável à elevação do mar, dizem cientistas

Autoridades reconheceram que a região enfrenta sério problema ambiental. Dos 5,5 milhões de habitantes do sul do estado, 75% estão

perto do mar.

06 / 01 / 2015 Itaipu mantém liderança na geração de energia acumulada

Após mais de duas décadas de liderança mundial no ranking de geração de energia anual, a Usina Hidrelétrica de Itaipu foi ultrapassada, em 2014, pela chinesa Três Gargantas. Em produção acumulada, no entanto, nenhuma outra gerou tanta energia quanto a usina brasileiro-paraguaia.

06 / 01 / 2015 Temporal coloca SP em atenção e alaga bairro de Osasco/SP

Jardim Rochdale voltou a sofrer com enchentes nesta segunda-feira. Ao menos 11 árvores caíram na capital paulista durante a chuva forte.

06 / 01 / 2015 Cientistas descobrem tratamento contra malária baseado em uso de planta

Durante décadas, médicos e servidores de saúde pública em todo mundo tiveram suas tentativas de tratar a malária frustradas pela capacidade do parasita de desenvolver resistência aos medicamentos.

06 / 01 / 2015 Total de mortos por ebola ultrapassa 8 mil na África Ocidental

Ao todo, foram 20.656 pessoas infectadas, das quais 8.153 morreram. Serra Leoa teve maior aumento no número de mortos, segundo relatório.

06 / 01 / 2015 Tartaruga-oliva encalha e biólogos fazem a soltura em praia do Piauí

Animal foi encontrado encalhado por moradores da Praia Peito de Moça. Tartaruga chegou a passar quatro dias em monitoramento até ser solta.

06 / 01 / 2015 SpaceX tentará pouso de precisão do foguete Falcon no Atlântico

Empresa trabalha em tecnologia que permita recuperar 1ª seção de foguete. Objetivo é reduzir custos; pouso em plataforma é 'muito difícil', diz SpaceX.

06 / 01 / 2015 Equipe descobre nova espécie de esponja de cristal no Mediterrâneo

A descoberta foi uma surpresa porque as esponjas de cristal costumam viver em áreas frias como as polares ou as grandes profundezas marinhas, enquanto no Mediterrâneo, inclusive em suas zonas mais profundas, a temperatura de água não costuma ser menor do que os 13 graus centígrados.

06 / 01 / 2015 2014 foi o ano mais quente no Reino Unido desde 1910

De acordo com os números provisórios divulgados na segunda-feira (5), 2014 registrou uma temperatura média de 9,9°C, o que representa um aumento de 0,2°C em relação ao recorde anterior, em 2006.

06 / 01 / 2015 Primeiro filhote de tubarão-bambu nasce no Aquário de Paranaquá/PR

O animal tem 13 centímetros e 11,2 gramas. Ele já pode ser visto pelos visitantes.

06 / 01 / 2015 Por chifre, rinocerontes são mortos em parque na Índia

Há algumas semanas, uma fêmea foi massacrada para a retirada do chifre do mesmo parque.

06 / 01 / 2015 Grão integral reduz risco de doenças cardíacas, mas não de câncer

Cada porção de grão está associada a um risco 5% menor de mortalidade. Cientistas observaram histórico médico de 74 mil mulheres e 44 mil homens.

06 / 01 / 2015 Cientistas criam 'nanoequipamento' que pode detectar vida fora da Terra

Sensor será apresentado a agências espaciais para investigar planetas. Testes foram feitos com bactérias, células humanas e levedura.

06 / 01 / 2015 Vegetação na Europa absorve mais CO2 do que era esperado inicialmente

Resultado foi obtido com dados de satélites dos EUA, Europa e Japão. Apesar disso, o volume de CO2 na atmosfera ainda é bastante alto.

06 / 01 / 2015 Bombeiros lutam contra os incêndios na Austrália

Cerca de 13.000 hectares foram arrasados nesta zona, e muitas casas estão ameaçadas pelo fogo, segundo o corpo de bombeiros e as equipes de socorro do Estado.

05 / 01 / 2015 Cantareira mantém nível de água em 7,1% há três dias, diz Sabesp

O nível dos seis reservatórios que formam o Sistema Cantareira, principal manancial da região metropolitana de São Paulo, manteve-se no mesmo patamar registrado desde o dia 2 de janeiro.

05 / 01 / 2015 Arroz de Fukushima supera pela primeira vez os controles de radiação

Em 2014, 10,75 milhões de sacos de arroz foram submetidos a testes. Todos tiveram resultado abaixo da média nacional, segundo jornal.

05 / 01 / 2015 Obesidade não significa estar mal de saúde

Os resultados confirmam o que os cientistas já haviam observado entre a população: aproximadamente um quarto das pessoas obesas não sofre complicações passíveis de provocar problemas cardíacos, acidentes vasculares cerebrais ou diabetes.

05 / 01 / 2015 Pesquisadores encontram tratamento celular contra a demência

Estudo com células-tronco foi feito na Universidade de Louvain, na Bélgica. Descoberta seria o primeiro passo no desenvolvimento de um remédio.

05 / 01 / 2015 Férias sempre sustentáveis

Brasileiros preferem destinos de praia e sol e vale todo cuidado para desfrutar desses locais de forma consciente.

05 / 01 / 2015 Municípios do RJ têm chuva forte após domingo de sol e calor

Rios da Baixada Fluminense entraram em estágio de alerta máximo. Rajada de vento forte foi registrada próximo ao Galeão, 59,2 Km/h.

05 / 01 / 2015 Alerta de saúde é decretado em Medellín por causa do chikungunya

Estado onde fica capital colombiana detectou 600 casos suspeitos do vírus. Dentre os infectados, 10 foram importados de outros lugares do país.

05 / 01 / 2015 Temporais causam alagamentos em várias cidades do norte do Paraná

Chuva na tarde deste domingo deixou ruas de Maringá embaixo d'água. Em Apucarana, acumulado passou de 73mm, segundo o Simepar.

05 / 01 / 2015 Sobe para 6 o número de mortos após fortes chuvas e enchentes na Argentina

O temporal provocou a evacuação de pelo menos 200 pessoas em vários municípios localizados entre Posadas, a capital da província de Misiones, e a cidade de Monte Carlo, junto à fronteira com o Brasil, a cerca de 150 quilômetros ao norte de Posadas.

05 / 01 / 2015 Combates afugentam passarinhos do Iraque

Estorninhos, que são iguarias e símbolos de boa sorte, costumam migrar ao país durante o inverno europeu.

05 / 01 / 2015 Incêndios destroem 12 mil hectares de vegetação no sul da Austrália

Altas temperaturas no verão contribuem para aumento de incêndios no país. Milhares de pessoas foram obrigadas a deixar suas residências.

05 / 01 / 2015 Arqueólogos descobrem tumba de uma rainha do Antigo Egito

Jentkaus III era esposa de um faraó da V dinastia que reinou há cerca de 4.500 anos.

05 / 01 / 2015 Sol começa o ano com enorme 'buraco' perto do polo sul do astro

Buraco coronal é caracterizado por região mais escura. Foto foi tirada por instrumento da Nasa em 1º de janeiro.

05 / 01 / 2015 Temporal em São Paulo registra 359 raios e 3.913 relâmpagos

Ventos de até 96 km/h arrancaram 326 árvores em um violento temporal. Especialistas explicam o que você precisa saber para se proteger de raios.

29 / 12 / 2014 Inundações na Malásia e Tailândia matam pelo menos 24

É a pior enchente na Malásia em mais de uma década. Foram dez mortes na Malásia e outras 14 na Tailândia.

29 / 12 / 2014 Com árvore sagrada, projeto busca criar 'pequena África' em Piracicaba/SP

Área de lazer que abrigou quilombo entre 1750 e 1805 recebeu 13 plantas. Projeto de professor tem a intenção de instalar biblioteca temática no local.

29 / 12 / 2014 Uruguai decreta alerta amarelo por fortes tempestades

Uma massa de ar frio e instável chegou ao país e pode provocar a formação de tempestades pontualmente intensas.

29 / 12 / 2014 Desmatamento na Amazônia tem alta de 427% em novembro, diz Imazon

Dado se refere ao mesmo mês de 2013; monitoramento é não-oficial. Estado que mais desmatou foi o Pará, indica a ONG.

29 / 12 / 2014 Chuvas não mudam realidade de reservatórios do noroeste paulista

Três usinas hidrelétricas da região ainda operam no limite. Sistema Ilha Solteira - Três Irmãos continua com 0% da capacidade.

29 / 12 / 2014 Após 'recuperação', Rio Piracicaba volta a ter pedras e volume cai 85%

Vazão do manancial neste domingo (28) é de 71,8 mil litros por segundo. Chuvas do início da semana garantiram o retorno do turismo ao local.

29 / 12 / 2014 Sensação térmica em Antonina/PR chega a 54°C neste domingo, diz Simepar

Em Paranaguá, segundo Simepar, sensação foi de 51°C neste domingo (28). Depois da chuva, temperatura caiu mais de 10°C em Antonina, litoral do PR.

29 / 12 / 2014 Terremoto de 4,9 graus estremece extremo norte do Chile

Um terremoto de magnitude 4,9 na escala Richter afetou neste domingo às regiões de Arica, Parinacota e Tarapacá, no extremo norte do Chile, porém ainda sem informações sobre vítimas ou danos materiais.

29 / 12 / 2014 Brasileiras fazem três vezes menos mamografias do que recomenda a OMS

Das mais de 10 milhões de mamografias esperadas pelo Instituto Nacional do Câncer (Inca) em mulheres entre 50 e 60 anos de idade em 2013, somente 2,5 milhões foram realizadas.

29 / 12 / 2014 Hipopótamo fica ferido após saltar de caminhão em Taiwan

Animal teria ficado assustado quando motorista freou veículo. Hipopótamo quebrou perna e teve ferimentos em seus longos dentes.

29 / 12 / 2014 Segunda-feira será de calor e chuva em Mato Grosso do Sul, prevê Inmet

Temperaturas chegam a 38°C em algumas regiões do estado. Também deve chover na virada do ano.

29 / 12 / 2014 Seca tornou 2014 um ano difícil para os produtores do Alto Tietê

Eles precisaram trabalhar em dobro para vencer desafios. Com a época das chuvas, esperança se renova.

30 / 12 / 2014 'Beijo de mosca em flor' vence concurso de fotos da Sociedade Ecológica Britânica

Imagens de libélulas, cobras, gaivotas em locais históricos e até de uma zebra morta foram selecionadas.

30 / 12 / 2014 Número de casos de ebola ultrapassa 20 mil na África Ocidental, diz OMS

Ao todo, morreram 7.842 pessoas vítimas da doença até o momento. Serra Leoa é atualmente o país que foi mais afetado pela epidemia.

30 / 12 / 2014 Chuvas fazem reservatório de Furnas subir 27 centímetros no Sul de MG

Volume de água já traz esperança para quem mora às margens do lago. Comerciantes que vivem do turismo esperam melhorar negócios nas férias.

30 / 12 / 2014 Raio mata 4 da mesma família e deixa 4 feridos em praia de SP

De acordo com informações dos bombeiros, oito pessoas foram atingidas. Temporal atingiu o litoral de São Paulo por volta das 14h desta segunda-feira (29).

30 / 12 / 2014 Objeto que caiu em sítio de MS pode ser lixo espacial, acredita especialista

Professor da UFMS diz que deve ser tanque de combustível de foguete. Cilindro foi encontrado em chácara na zona rural de Santa Rita do Pardo.

30 / 12 / 2014 Índio cursa mestrado na UFG para garantir melhor educação em aldeia

Com melhor formação, estudante espera que indígenas mantenha sua cultura. Ercivaldo é o 1º indígena a cursar o mestrado em direitos humanos pela UFG.

30 / 12 / 2014 Chuvas deixam São Paulo em estado de atenção

Nesta terça-feira (30) será outro dia de muito calor na capital, mas os termômetros devem ficar em torno de 30 graus Celsius, um pouco mais baixo do que nos dias anteriores. À tarde e à noite deve chover.

30 / 12 / 2014 ICMBio altera normas de visita da Área de Proteção Ambiental da Costa dos Corais

O objetivo é ordenar a visitação nas áreas onde estão as piscinas naturais, compatibilizando as atividades com a conservação ambiental, além de inserir uma nova categoria de transporte de passageiros – a escuna.

30 / 12 / 2014 Com chuvas, nível do Cantareira fica estável em 7,3%

As chuvas têm ajudado a manter o nível do Cantareira acima do patamar de 7% desde o último dia 24.

30 / 12 / 2014 Caso de ebola é diagnosticado na Escócia, diz governo

Governo escocês confirmou um caso de ebola diagnosticado em Glasgow. Trata-se de um profissional da saúde que voltou de Serra Leoa.

30 / 12 / 2014 Mais de 42 mil mudas são plantadas e distribuídas em João Pessoa em 2014

Número representa um crescimento 82,6% em relação a 2013. Entre os locais que recebem mudas estão escolas.

30 / 12 / 2014 Japão sacrifica 42 mil frangos por novo surto de gripe aviária

É o segundo surto no arquipélago em menos de um mês. Sacrifício dos animais ocorre a 10 km ao redor da área contaminada.

30 / 12 / 2014 França e Peru buscam acordo ambicioso sobre mudança climática em 2015

França e Peru demonstraram nesta segunda-feira (29) intenção de que sejam alcançados "acordos ambiciosos" com relação à mudança climática na cúpula de Paris, em dezembro de 2015, sobre as bases dos resultados obtidos na realizada em Lima neste mês.

31 / 12 / 2014 Inundações deixam pelo menos 30 mortos nas Filipinas

Pelo menos 30 pessoas morreram na sequência das inundações e consequentes deslizamentos de terras, provocados pela tempestade tropical Jangmi que atinge o Sul e o Centro das Filipinas, pelo segundo dia, informaram as autoridades.

31 / 12 / 2014 Tartaruga marinha é libertada em mar de Vitória após reabilitação

Animal foi encontrado na praia de Manguinhos, na Serra, no início do mês. Tartaruga chegou a passar por uma cirurgia para retirada de tumores.

31 / 12 / 2014 Especialista ensina como se proteger de uma tempestade com raios

Andar de cócoras é uma forma de se salvar quando não há abrigo. Para-raios devem ter manutenção a cada cinco ou dez anos.

31 / 12 / 2014 Japão ordena sacrifício de mais 37 mil frangos por surto de gripe aviária

Este é o terceiro foco da doença no país em menos de um mês. Na segunda, outros 42 mil animais foram sacrificados.

31 / 12 / 2014 De pontapé na Copa a pouso em cometa, a ciência marcou presença em 2014

Foram apenas 72 horas, mas o simples fato de seres humanos terem pousado um robô com sucesso em um cometa é algo para ser celebrado não somente em 2014, mas durante os próximos anos.

SCIENCE

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Lucas Reusser, Paul Bierman, and Dylan Rood

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Slip re-orientation in oblique rifts

M. Philippon, E. Willingshofer, D. Sokoutis, G. Corti, F. Sani, M. Bonini, and S. Cloetingh

Geology published 7 January 2015, 10.1130/G36208.1

<http://geology.gsapubs.org/cgi/content/abstract/G36208.1v1?source=gsw>

The source of gypsum in Mammoth Cave, Kentucky

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<http://geology.gsapubs.org/cgi/content/abstract/G36131.1v1?source=gsw>

Re-Os dating of pyrite confirms an early diagenetic onset and extended duration of mineralization in the Irish Zn-Pb ore field

Danny Hnatyshin, Robert A. Creaser, Jamie J. Wilkinson, and Sarah A.

Gleeson

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Terrestrial acidification during the end-Permian biosphere crisis?

Mark A. Sephton, Dan Jiao, Michael H. Engel, Cindy V. Looy, and Henk

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Synchronous crustal growth and reworking recorded in late Paleoproterozoic granitoids in the northern Tarim craton: In situ zircon U-Pb-Hf-O isotopic and geochemical constraints and tectonic implications

Rongfeng Ge, Wenbin Zhu, Simon A. Wilde, Jingwen He, and Xiang Cui

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Tibetan chromitites: Excavating the slab graveyard

Nicole M. McGowan, William L. Griffin, Jose M. Gonzalez-Jimenez, Elena

Belousova, Juan Carlos Afonso, Rendeng Shi, Catherine A. McCammon, Norman

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The enigma of crustal zircons in upper-mantle rocks: Clues from the Tumut ophiolite, southeast Australia

Elena A. Belousova, Jose Maria Gonzalez Jimenez, Ian Graham, William L.

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Precise chronology of Little Ice Age expansion and repetitive surges of Langjokull, central Iceland

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Cyclic steps along the South Taiwan Shoal and West Penghu submarine canyons on the northeastern continental slope of the South China Sea

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D. A. Dodge and W. R. Walter

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Modelling of dissolution-precipitation ion-exchange reactions for the
development of flame perthite in a suite of sheared alkaline rocks: an
example from Chimakurthy, Eastern Ghats, India
Sudip Bhattacharyya, P. Sengupta, and K. Pfaff
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Hlouekite, (Ni,Co)Cu₄(AsO₄)₂(AsO₃OH)₂(H₂O)₉, a new member of the
lindackerite supergroup from Jachymov, Czech Republic
J. Plašil, J. Sejkora, R. Koda, M. Novak, A. V. Kasatkin, P.
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Bluebellite and mojaveite, two new minerals from the central Mojave Desert,
California, USA
S. J. Mills, A. R. Kampf, A. G. Christy, R. M. Housley, G. R. Rossman, R.
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from presentations at the Goldschmidt 2013 conference
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[Ca(OH)₂] surfaces under geological disposal facility conditions
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Recent advances in clean-up strategies of waters polluted with
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The crystal structure of rabejacite, the Ca^{2+} -dominant member of the zippeite group
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S. Kharbish and P. Andráš
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Modelling of dissolution–reprecipitation ion-exchange reactions for the development of flame perthite in a suite of sheared alkaline rocks: an example from Chimakurthy, Eastern Ghats, India
Sudip Bhattacharyya and P. Sengupta
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Bluebellite and mojaveite, two new minerals from the central Mojave Desert, California, USA
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Hloušekite, (Ni,Co)Cu₄(AsO₄)₂(AsO₃OH)₂(H₂O)₉, a new member of the lindackerite supergroup from Jáchymov, Czech Republic
J. Plášil, J. Sejkora, R. Škoda, M. Novák, A. V. Kasatkin, P. Škácha, F. Veselovský, K. Fejfarová, and P. Ondruš
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- BGS launches geological maps portal (24 Oct 2014)
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