Department of Earth Sciences

The Geode

Issue 1
March/
April
2019

Hello, and Welcome!

A very big and warm welcome to the second term of 2019, Earth Sciencers! 2019 started with a bang (or an earthquake), and the department is in full swing.

Last term was quite an exciting one, with various get togethers hosted in the quad. We would like to thank each and every faculty member and student for their enthusiasm and attendance of these events. In case you weren't around, here is a recap:

- The Earth Sciences Welcoming Braai took place on 25 January, where we also got to meet the Honours group for 2019.
- Classes started on 2 February.
- As geos do, we had another braai on 14 February for those who didn't have any Valentine's Day plans.
- 23 February was Maties Open Day.
- 15 March saw a pub crawl for St Patrick's Day.
- On 27 March the Honours group hosted another braai, because why not?

If you have missed out, fear not! A few more events are in the pipeline, which will be communicated through email, posters, and Facebook. Make sure to try and join these events when you can. It's a great way to interact with the staff and students in the department. One upcoming event to save in your diary is Geology Quiz Night on Tuesday, 30 April. Keep your eyes peeled for more information!

This month we open with the very first issue of *The Geode*. Some of you may remember *The Geode* from its first appearance years ago, and some of you have no idea what it looked like or what to expect. The idea is to restart this departmental newsletter and share what has been happening with the Earth Sciences Department, as well as science in general. Luckily we have only missed two academic months this year, and April seems like a good place to start anyway.

Please remember that the Stellenbosch University Earth Science Society (SUESS) Committee Applications close on 5 April 2019. Students, please apply! This is a great way to be involved in the department, and being on the committee also develops your planning and interaction skills. If you are considering applying, follow https://forms.gle/T1YJx1eiba7Ajyv7A or follow the QR code below:

That's all for now, folks! Good luck with term two. Remember: work hard, play hard!

St Patrick's Day

Open Day

Valentines Braai

The Geode

What the Intredipus?

by Tanisha Schultz

"Early in their evolution, tyrannosaurs hunted in the shadows of archaic lineages, such as allosaurs, that were already established at the top of the food chain."

Tyrannosaurus Rex ("Tyrant Lizard King") is a well-known Tyrannosauroidea, with a reputation of being one of history's most ferocious predators. Fossil evidence shows that the Tyrannosaurus Rex (T.rex) was about 12 m long and between 4.6 m to 6 m tall, with massive jaws that could produce up to 5800 kg of force.

T.rex only lived for a short period of time, ± 3 million years total, during the end of the Cretaceous Period. The first fossils found date to ±67 million years old, and the last fossils found are ±65 million years old. At this time, North America was split in half, separated by the Western Interior seaway. T.rex shared the small continent of Laramidia (now western north America) with other species such as the Triceratops, Ankylosaurs and other, smaller therapods. Their extinction came about during the largest mass extinction event 65 million years ago (Cretaceous-Tertiary Period).

The T.rex wasn't always such a large size and right at the top of the food chain. A large gap in the mid-Cretaceous record left scientists speculating on the evolution of these beasts. Aside from isolated teeth, palaeontologists were missing skeletal evidence of the North American Tyrannosaurs from ±150 million years to 80 million years ago. Researchers struck gold in 2013, when Lindsay Zanno stumbled across fossilised remains - a partial right leg jutting out of Utah's mid-Cretaceous Cedar Mountain formation. Through the efforts of a team of scientists, including Dr Ryan Tucker from the Department of Earth Sciences at Stellenbosch, light was shed on the origin of the T.rex lineage.

Cue Moros Intredipus, an ±78 kg new member of the Tyrannosauroidea, 90 times lighter than the famous T.rex, dated to ±96 million years ago. M. Intrepidus is the oldest Cretaceous tyrannosaur skeleton found in the region, pushing the date record back by 15 million years.

The size of the dinosaur meant that it was of light weight, and exceptionally fast. As a result, these members could take advantage of new opportunities that came with warming temperatures, raising sea levels, and shrinking ranges, reconstructing the ecosystems at the beginning of the Late Cretaceous. This new fossil is helping paleontologists better understand North America's tyrannosaurs and their evolution to becoming the large, apex predators that they are so well known for.

Read more: *"Diminutive fleet-footed tyrannosauroid narrows the 70-million-year gap in the North American fossil record"* by Lindsay E. Zanno, Ryan T. Tucker, Aurore Canoville, Haviv M. Avrahami, Terry A. Gates and Peter J. Makovicky published in Nature Communications Biology.

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The Geode

Trending in Science

by Liam Quinlan

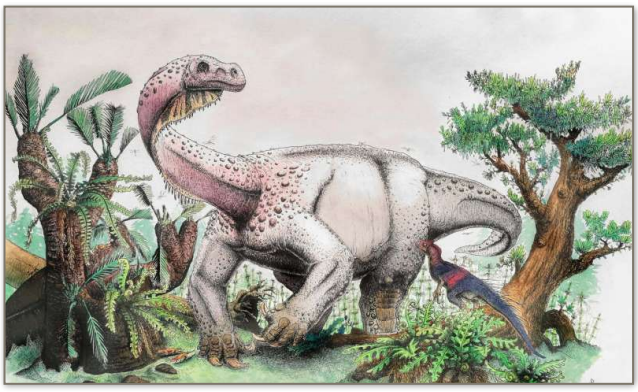
Methane on Mars

Mars rover Curiosity's discovery of methane in the Martian atmosphere was just the beginning. Analysis of a 3 billion-year-old mudstone from Mars has revealed organic molecules and volatiles (thiopene, methylthiophenes methanethiol and dimethylsulfide). Although rudimentary, these molecules are comparable to organic rich sedimentary rocks on Earth. These molecules may be representative of fragments of larger molecules that existed in the Gale meteor impact crater, believed to have held a lake between 3.5 and 3.8 billion years ago. Curiosity has been on Mars for 6 years and 240 days since landing in 2012, far surpassing its 2 year expected lifetime, and still going strong. Curiosity will celebrate its 7th anniversary on the red planet on the 6th of August this year.

Read more: **https://edition.cnn.com/2018/06/07/us/nasa-mars-curiosity-rover-findings/index.html**

Ledumahadi

Ledumahadi, which is Sesotho for "a giant thunderclap at dawn", is the name of a new species of sauropod dinosaurs discovered in South Africa. The 200 million year old relative of the Brontosaurus weighed in at almost 12 tons, twice the size of a large African elephant (yes, elephants weigh up to 7 tons Michelle). A team of international scientists, led by University of the Witwatersrand palaeontologist Professor Jonah Choiniere, described the new species found in the Clarens area of the Free State Province.



Read More: https://edition.cnn.com/2018/09/27/world/new-giant-dinosaur-brontosaurus-relative/index.html

Mansourasaurus Shahinae

A discovery from the Dakhla Oasis in central Egypt yielded several bones detailing the most complete remains of any mainland African land vertebrate yet discovered. The titanosaurian Cretaceous dinosaur, Mansourasaurus shahinae, lived ±80 million years ago near the shore of an ancient ocean that preceded the Mediterranean Sea, weighing about 5.5 tons with a juvenile body length of about 8 to 10 m. Paleontologist Hesham Sallam of Egypt's Mansoura University led the study that recovered parts of its skull; lower jaw, neck and back vertebrae; ribs, shoulder and forelimb; back foot; and osteoderms.

Read More: https://www.reuters.com/article/us-science-dinosaur/fossil-of-school-bus-sized-dinosaur-dug-up-in-egyptian-desert-idUSKBN1FI215

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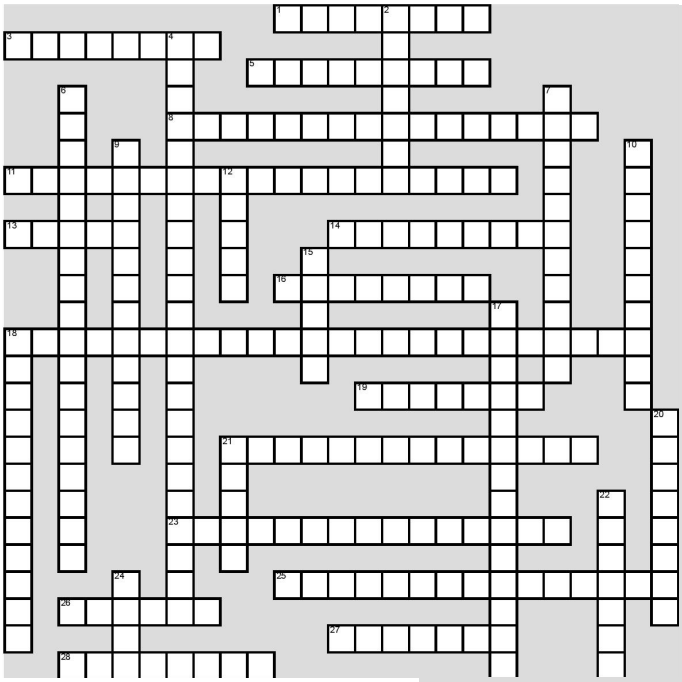

Across

1 The first amphibians began to evolve from this fish.
3 The time it takes for half of radioactive atoms to decay.
5 The magma cools and hardens into a mass of igneous rock.
8 Over time elements break down or decay by releasing particles and energy.
11 A record of the life forms and geological events in Earth's history.
13 A solid copy of an organism.
14 A group of hard shelled animals that evolved 500 million years ago.
16 All the organisms evolved in this era and they all lived in the sea.
18 Fossils and rocks formed at this time.
19 Earth's continents moved to form a supercontinent.
21 Many types of organisms or living things become extinct at the same time.
23 A type of rock that is made of hardened sediment.
25 The time period where life appeared on Earth.
26 All plants and animals contain this and it is a radioactive form of carbon.
27 When all the atoms of a particular type of matter are the same.
28 It was 225 million years ago and this is when the first dinosaurs appeared.

Down

2 The preserved remains of living things.
4 Scientists had a hypothesis that Earth formed at the same time as this planet and the sun.
6 To determine the relative ages of sedimentary rock layers.
7 The first vertebrates.
9 Provides evidence about the history of life on Earth and shows groups of organisms that have changed over time.
10 Lava that hardens on the surface.
12 All matter you see including rocks and is made up of tiny little particles.
15 A break in Earths surface.
17 Scientist who study fossils.
18 Provide evidence of the activities of ancient organisms.
20 Animals that have scaly skin and are cold blooded.
21 Is a hollow area in sediment in the shape of an organism or part of an organism.
22 Eras that are divided into units of geological time.
24 Geologists divide this into three times: Paleozoic, Mesozoic, and Cenozoic.

SU Earth Science Society

@suearthsciences

DON'T FORGET!

Wednesday Lunch Seminars have moved to room 2041.

WANT TO BE INVOLVED?

If you would like to be involved in *The Geode*, email Tanisha at 18191010@sun.ac.za or Tahnee at tahneeotto@sun.ac.za.

Anyone welcome!

EMERGENCY CONTACTS

SU Crisis Hotline: 010 205 3032

Campus Security Emergency: 021 808 2333

SAPS Emergency: 10111

SAPS Stellenbosch: 021 809 5015

Ambulance: 10177

Fire Department: 021 808 8888

Traffic Department: 021 808 8813

Public Hospital Stellenbosch: 021 808 6147/84

Medi-Clinic Stellenbosch: 021 861 2094/5

Important Dates

20 March 2019 : First Term Ends

21-31 March 2019: Recess

1 April 2019: Recess

17 May 2019: Second Term Ends

28 June 2019: First Semester Ends

29 June - 21 July 2019: Recess

22 July 2019: Third Term Starts

6 September 2019: Third Term Ends

7-15 September 2019: Recess

16 September 2019: Fourth Term Starts

25 October 2019: Fourth Term Ends

13 December 2019: Second Semester Starts

Exams

June

21 May-10 June 2019: First Round

11 June-28 June 2019: Second Round

November

29 October - 20 November 2019: First Round

21 November - 7 December 2019: Second Round

Editing and Layout: Tahnee Otto. All articles by respective Authors.