**WEBCAST: *Forgotten Elephants of Deep Time with Paleontologist Advait Jukar***

The webcast program will be broadcast at 11am and 2pm ET on December 12, 2019. A recording of the live broadcast will be available later that evening.

**Participation Logistics**

* Participate in the webcast here: <https://naturalhistory.si.edu/education/distance-learning/forgotten-elephants-deep-time>.
* There will be a 3-minute video looping on this webpage before the live programs begin. The live shows should automatically start playing at 11am and 2pm ET. If they do not, try refreshing your page.
* See our Webcast Technology Guide (PDF) for troubleshooting guidance : https://naturalhistory.si.edu/sites/default/files/media/file/smithsonian-science-how-webcasts-tech-guide-updateoct24-2019.pdf
* Email ScienceHow@si.edu on if you continue to have connectivity problems.
* We recommend using a separate phone, tablet, or computer to facilitate your students’ questions and poll responses. Go directly to **Slido.com/ScienceHow** on any device.

**Pre- and Post- webcast Resources:**

1. **Watch this 3-minute video with students** to introduce them to paleontologist Advait Jukar and how he studies fossil elephants: <https://naturalhistory.si.edu/education/distance-learning/forgotten-elephants-deep-time/meet-scientist-paleontologist-advait-jukar>
2. **Distribute the student worksheet,** [**https://naturalhistory.si.edu/sites/default/files/media/file/student-worksheetsciencehow-fossil-elephants12122019.docx**](https://naturalhistory.si.edu/sites/default/files/media/file/student-worksheetsciencehow-fossil-elephants12122019.docx)**,** for use **before and after** the live webcast
3. **Start a conversation** with your students about who does science and how they do it.
* **Before watching the live webcast on 12/12:**
	+ Why do scientists study fossils?
	+ What can you learn from fossils?
	+ Can fossil elephants tell scientists about their habitat?
	+ What kind of skills do you think scientists use to study fossils? Do you use any of those same skills? (e.g. making observations, finding patterns, asking questions)
* **After watching the live webcast on 12/12:**
	+ Do you have new ideas about what a scientist does?
	+ Do you have any new ideas about what we can learn from fossils?
	+ Can you remember how Advait studies fossil elephants?
	+ What kind of skills do you and scientists have in common?
1. **Submit your students’ questions:** Do your students have more questions about fossil elephants or being a scientist? Send students’ questions to ScienceHow@si.edu.

**Background Information for Teachers**

* **About Paleontologist Advait Jukar**

As a kid, Advait Jukar loved the extinct monsters of deep time, like dinosaurs and mammoths. This is why he feels so lucky now, getting to study these fossil giants every day as a paleontologist at the National Museum of Natural History. Advait specializes in the study of fossil elephants and their extinct relatives, like mastodons, mammoths, and gomphotheres.

*“I love elephants not only because they’re charismatic and have an incredibly interesting evolutionary history, but also because in many ways, they’re like us; they live in complex social groups and exhibit a range of emotions. If we let the remaining species go extinct, that entire branch of the mammal tree of life is gone forever. I hope that never happens.”*

* **About Fossil Elephants**

The earliest elephant relatives originated in Africa about 60 million years ago and dispersed to every continent on earth, except Antarctica and Australia. There are about 165 known elephant species from the fossil record, and scientists estimate that there would have been many more that we haven't found yet, over the whole history of this special group, called a clade. In Earth’s more recent history, between 50,000 and 40,000 years ago, there were 16 species of elephants and their relatives living at the same time around the world, including at least 7 in the United States. Today, there are only three species of elephants that remain: the African savannah elephant (Loxodonta africana), the African forest elephant (Loxodonta cyclotis), and the Asian elephant (Elephas maximus). Populations of all three species are declining, with Asian elephants at a much higher risk of extinction.

Today’s elephants are part of the order Proboscidea which consists of modern elephants and their extinct relatives such as mastodons, mammoths, and gomphotheres. All the animals in this group have a proboscis, or trunk, that they use to eat and drink. While today there are only two surviving elephant genera, the African and Asian elephant, their evolutionary history is much more diverse.

Paleontologists use fossil elephant teeth to understand the animal’s diet and feeding behavior. There are two main types of teeth: high crowned and low-crowned teeth.

* **High-Crowned Teeth:** Animals that consume tougher, more abrasive foods are likely to wear down their teeth over time, and thus have evolved to have higher-crowned teeth as a result. These animals typically have an herbivorous **grazing** diet; they graze grasses.
* **Low-Crowned Teeth:** Animals that eat softer food have less wear, and therefore have low-crowned teeth. These animals typically have an herbivorous **browsing** diet; they browse branches, eating soft leaves.
* **Live Webcast Format- What to Expect**
	+ **Fossil Elephant Introduction-** Students will be introduced toPaleobiologistDr. Advait Jukar, who will provide an introduction to fossil elephants and how he studies them.
	+ **Body Size-** Advait will teach students how to examine fossil elephant skulls to determine how large the animal was. Students will do a simulated measuring activity, predicting the size of two mammoths based on skull measurements taken during the program.
	+ **Fossil Teeth-** Students will learn how fossil elephant teeth can be examined to reveal what the animal ate. Students will be shown a mystery tooth from an extinct elephant and asked to hypothesize what it ate based on the tooth’s patterns.
	+ **Evolution** Students will use newly acquired skills to determine which animal is more closely related to today’s elephants: mastodons or mammoths.
	+ Throughout the program, Dr. Jukar will show specimens from the Smithsonian’s collection, videos of living elephants from the National Zoo, and will interact with students through live polls and will answer as many questions from student viewers as possible.
* Additional resources, including real fossil elephant teeth from the Smithsonian’s collection, are available in this Smithsonian Learning Lab collection, <http://learninglab.si.edu/q/ll-c/XiCNg0Et1CUEVK36>
* Next Generation Standards Alignment for this program is listed on the landing page for this webcast, <https://naturalhistory.si.edu/education/distance-learning/forgotten-elephants-deep-time>