Not Quite Squid

Though the vampire squid's scientific name, *Vampyroteuthis infernalis*, means "vampire squid from hell," it's not actually a squid. The cephalopod is the sole member of its order, Vampyromorpha, a type of intermediate between squids and octopi. And at 1 foot long, it's not as terrifying as the name suggests, although its red eyes and black skin in some light levels give it an otherworldly appearance.

Making the Model

Preparator Carlisle Champalimaud crafted the vampire squid model for *Creatures of Light* using a squid from the market as a guide to re-creating the animal's gelatinous texture. While the model's tentacles are solid, the body is hollow and lightweight. After attaching the tentacles to the body, Champalimaud applied a two-part epoxy across the whole animal to make it appear as one piece. The final touch was the vampire squid's cloak, made of linen cloth painted with liquid plastic.

Bright Ideas

The vampire squid model gets its glow from interior LED lights in the tentacles and body. The whole animal was painted with black primer save for the arm tips and two large photophores so the model would glow in all the right places. Since a vampire squid's eyes reflect light rather than glow, Champalimaud painted them red from the inside and lined them with foil—yet another advantage of creating a hollow body mold.

Split Personality

The larger-than-life model shows the vampire squid in the process of switching between poses: not full "pineapple" position, yet with its beak and cirri visible. "The vampire squid is so transformative and elusive that the hardest part was narrowing it down to one form," says Champalimaud. "And being certain I've chosen the most interesting pose so viewers can see all the parts."

Make Your Own

Kids can make their own model that flashes, blinks, or glows with the "Make Your Own Creatures of Light" OLogy activity at **amnh.org/OLogy**. Grab a flashlight and art supplies to see what vampire squids, fireflies, anglerfishes, and other animals look like in the dark.

A Brilliant Defense

Humans marvel at the beauty of glowing organisms, but usually, nature's light displays serve a much more practical purpose.

When pushed to the limit by a predator, the vampire squid envelops its adversary in a smokescreen of glowing particles. After ejecting luminescent mucus from the tips of its eight tentacles, this master of disguise makes its escape, "flying" through water with its fins rather than jet-propelling like most other cephalopods. The sticky mucus, which glows for up to 10 minutes, may even coat the predator and make it more vulnerable to attack.

While this technique is the vampire squid's last resort, the animal has evolved a suite of finely controlled light tricks to avoid becoming a meal. When threatened, the creature curls its Dracula-like cloak of webbed arms around its soft body, exposing a black underside and fanglike projections, or cirri. From this "pineapple" position, meant to intimidate predators, the animal waves its glowing arm tips in a confusing display of fireworks. Should the predator bite off an arm tip, it can be sacrificed and regenerated, much like a lizard's tail.

Meanwhile, two large light organs that mimic eyes peer from beneath the cloak. The vampire squid can slowly contract the muscles around these photophores, giving the impression that the "eyes" are shrinking and that the squid has sped away. With all these moving and glowing parts, predators are often too disoriented to strike.

Scientists still have much to learn about this creature of light, which lives 3,000 feet below sea level in the zone of the ocean with the lowest concentration of oxygen.

Members receive free admission to *Creatures of Light: Nature's Bioluminescence*, which features a model of the vampire squid at 350 percent its natural size. For exhibition credits, see page 15.

Vampire squid model

FREE

Download the *Creatures of Light* app for iPad today

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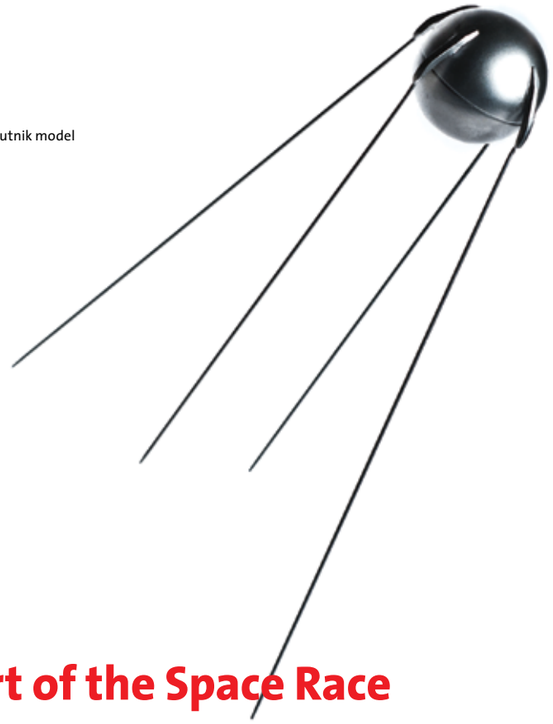

Sputnik model

Start of the Space Race

On October 4, 1957, the Soviet Union launched Sputnik-1, the first man-made satellite to successfully orbit the Earth, its beeping signal picked up by radio operators around the globe. Weighing in at just under 184 pounds and measuring 22.8 inches in diameter, Sputnik soared to space amid the tensions of the Cold War between the United States and the Soviet Union, creating significant political and scientific fallout. A life-sized model of the satellite, whose name means "fellow traveler" in Russian, is featured in the current exhibition *Beyond Planet Earth: The Future of Space Exploration.*

Sputnik's success sparked a space race in which the U.S. would eventually claim victory when it landed a crew on the Moon on July 20, 1969. But the story of jockeying for supremacy in space obscures the lasting, positive legacy of Sputnik—the myriad technological advances that this first leap into space inspired and the countless subsequent satellites that have seemingly compressed distances on Earth while expanding our knowledge of the vast universe beyond.

Unmanned missions have explored every planet in the solar system and continue to travel beyond it, seeking images of the oldest, most distant galaxies. The International Space Station has hosted more than 200 men and women from countries around the world who conduct experiments and live and work in space. Private companies are also in the mix, developing commercial vehicles to ferry astronauts, private citizens, and cargo beyond Earth's atmosphere. Scientists talk of lunar bases, elevators from the Moon to Earth, mining asteroids, sending manned missions to Mars, and even creating a habitable environment there for humans through a process called terraforming.

"We've made some fabulous discoveries but there's much more yet to learn," says astrophysicist Michael Shara, curator of *Beyond Planet Earth.* "In the next 50, 75, 100, 300 years, if we put our minds to it, the solar system can be ours, the detection of life beyond Earth can be ours, and eventually all of the stars in the Milky Way, the 200 billion stars, the trillion planets can be ours to explore. We just have to have the will to do it."

Don't miss *Beyond Planet Earth: The Future of Space Exploration*, on view until August 12 and free for Members. For exhibition credits, see pages 15–16.

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Competitive Advantage

A generation of schoolchildren felt the reverberation of Sputnik in the classroom. On September 2, 1958, Congress passed and President Dwight D. Eisenhower signed the National Defense Education Act, which poured federal money into elementary and high schools across the country to boost math, science, and foreign language education.

Good Connections

It is impossible to overestimate the impact that satellites have had on everyday life, from the first television signals transmitted by AT&T's Telstar satellite in 1962 to the thousands of satellites supporting global positioning systems, the telecommunications industry, world-wide weather monitoring, scientific research, and more.

Picturing Space

Satellites help generate images and data used by the Museum's astrovisualization team to create popular Space Shows in the Hayden Planetarium and to update the Digital Universe Atlas, the scientifically accurate, three-dimensional map of the universe. The monthly Hayden Planetarium Astronomy Live! programs sometimes show all the satellites in Earth-orbit now.

The Hubble Legacy

For more than 22 years now, the Hubble Space Telescope has been orbiting Earth every 96 minutes at a distance of 380 miles, well beyond the distorting effects of Earth's atmosphere. Named for astronomer Edwin P. Hubble (1889–1953), it has sent back incomparable views of the universe and enabled such key discoveries as dark energy—the force thought to drive the expansion of the universe—and exoplanets, planets orbiting other stars.

On the Horizon

Scientists look forward to the planned 2018 launch of the James Webb Space Telescope. Named for the NASA administrator who oversaw the Apollo manned missions to the Moon, this telescope is designed to orbit about 1 million miles above the Earth and detect celestial objects much fainter and further back in time than even Hubble can detect.