RESEARCH HIGHLIGHTS

Smithsonian
Institution

JUNE 2019

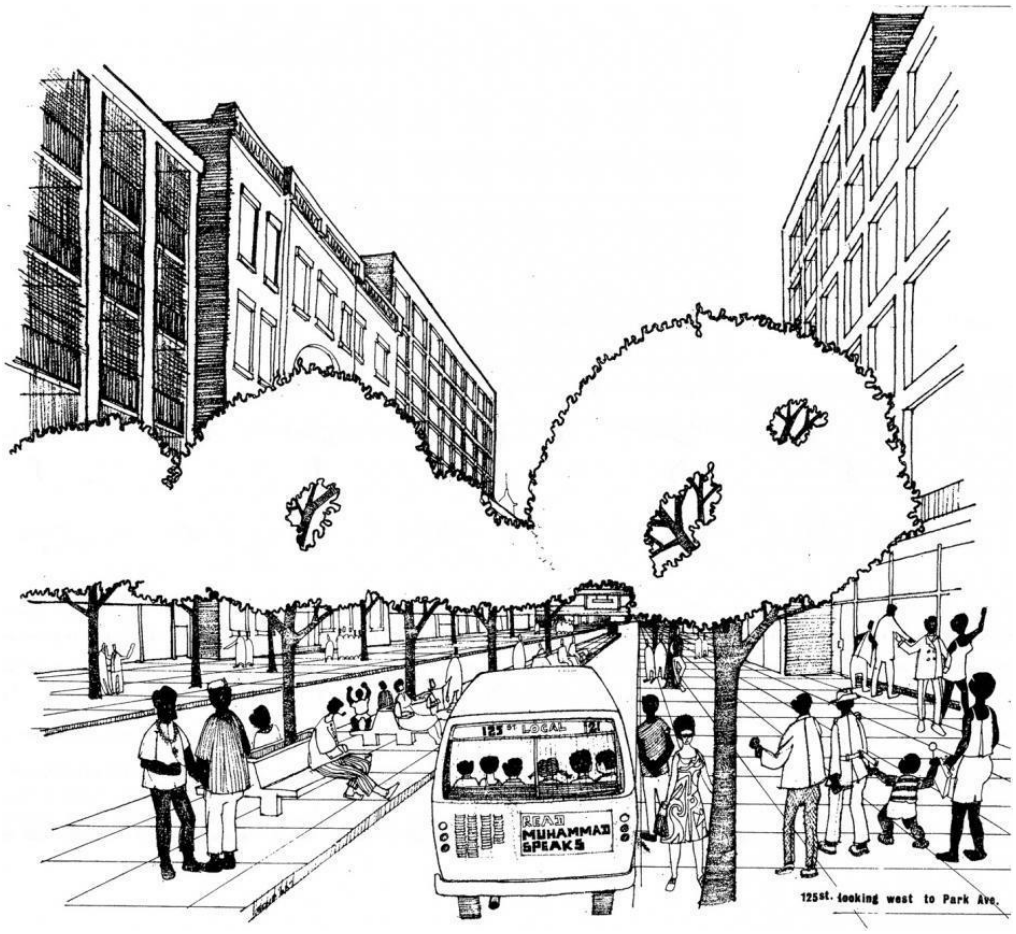
SHIFTING THE LANDSCAPE: BLACK ARCHITECTS AND PLANNERS, 1968 TO NOW

From September 27 - 29, 2018, the National Museum of African American History and Culture presented *Shifting the Landscape: Black Architects and Planners, 1968 to Now*, a symposium focused on the activism, engagement, and impact of black architects and planners over the past 50 years.

The 2018 symposium brought together architects, planners, and scholars of the built environment. Participants reflected on key events in the late 1960s that shaped architecture and planning in the decades that followed. Live-streamed presentations enhanced public access to black architects of today and highlighted projects of architects and planners currently working to create more equitable spaces. *Shifting the Landscape* also provided opportunities for high school and university students to engage with practicing architects and to learn about their different modes of practice.

Why 1968? In June 1968, Whitney M. Young Jr., Executive Director of the National Urban League, delivered a landmark address to the American Institute of Architects ("AIA"). He called for more diversity in the profession and challenged architects to act on critical issues facing urban communities. Following Young's speech, new funding initiatives opened doors for minority students to pursue architecture and planning degrees in greater numbers. Also during this era, architect J. Max Bond Jr. mentored several students and shaped their commitments to social justice and community needs.

Watch keynote presentations, panel discussions, and more from the 2018 symposium on NMAAHC's Ustream channel.



Architect J. Max Bond Jr. served as executive director of the Architects' Renewal Committee of Harlem ("ARCH"). In 1968, ARCH produced this community-oriented design for the 125th Street East Harlem Triangle Plan.
Drawing by E. Donald Van Purnell. Courtesy of Arthur Symes.

ForestGEO Network Provides Foundation for Remote Sensing of Forest Biomass

Tropical forests cycle more carbon and water than any other ecosystem, and they play critical roles in determining Earth's energy balance. Trees capture and store carbon from the atmosphere as they grow, and this may ameliorate the effects of increasing carbon emissions. Effectively using this in climate change models or in strategies to protect or restore forests depends on the ability to measure how much carbon is stored in forests and how that changes through time.

Several remote sensing missions by NASA and the European Space Agency will soon produce detailed carbon maps over all terrestrial ecosystems. These missions are dependent on accurate and representative ground-based datasets for the training and validating of their algorithms. There is now a renewed commitment to invest ground resources at sites where there currently is assurance of a long-term commitment locally and where a core set of data is already available—called "supersites." **Forest Global Earth Observatory** ("ForestGEO"), the global network of forest research sites, is engaged in these missions in several ways including through the Department of Energy's Next Generation Ecosystem Experiment with Brookhaven National Laboratory and other partners. ForestGEO has also proposed a strategy for enhanced coordination of global networks of forest plots, which would benefit biomass remote sensing.

What Stops Mass Extinctions? Lessons from the Amphibian Die-off in Panama

Black plague killed between 30 to 50 percent of people worldwide. The cause, *Yersinia pestis*, is still around, but people are not dying of the plague. An even more devastating modern disease caused by the chytrid fungus wiped entire frog and salamander populations off the map. New results from work at the **Smithsonian Tropical Research Institute** ("STRI") in Panama published in the March 29 edition of *Science*, reveal the outcomes of the chytridiomycosis epidemic and their implications for diseases of mass destruction.

"Imagine a deadly disease that affects not only humans but other mammal species like dogs, cats and cattle," said Roberto Ibáñez, STRI staff scientist and in-country director of the Panama Amphibian Rescue and Conservation Project. "Chytridiomycosis kills off most of the individuals in many different species of amphibians, but for some species it stops short of driving them to complete extinction."

Skin secretions from wild frogs that survived the epidemic inhibited growth of the fungus significantly more than secretions from frogs moved into captive breeding programs before the disease arrived. Researchers think that wild frogs became more resistant to the disease.

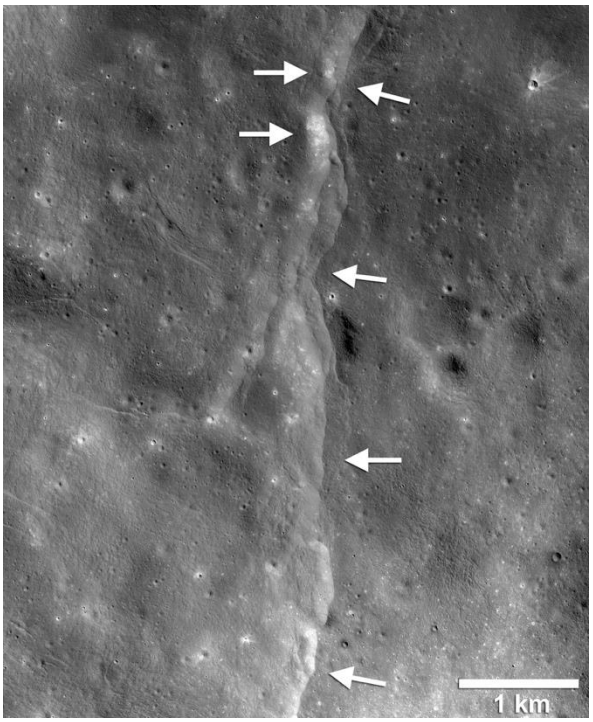
"The Panama Amphibian Rescue and Conservation Project collected healthy frogs before the outbreak," Ibáñez said. "We learned to breed them in captivity and are now releasing *Atelopus varius* in areas where the epidemic has passed, so it is extremely important for us to realize that the defenses of these frogs may be weaker than the defenses of frogs that survived the epidemic in the wild. Captive breeding programs must consider breeding and releasing frogs with stronger defenses and testing their skin secretions against the fungus is one useful tool to see which frogs are more resistant."

NASM Analysis Shows the Moon is Tectonically Active

Thousands of young cliff-like, fault scarps detected in images taken by NASA's Lunar Reconnaissance Orbiter Camera ("LROC") are evidence of a shrinking moon and recently active lunar faults. But just how recently these faults were active was not known. The Apollo astronauts placed seismometers on the moon that recorded shallow moonquakes, but the source of these quakes was also not known. New analysis of Apollo seismic data shows that some shallow moonquakes can be linked to young faults. This is evidence that the moon, like Earth, is tectonically active. The analysis is explained in "Shallow Seismic Activity and Young Thrust Faults on the Moon," a paper by lead author and **National Air and Space Museum** senior scientist Thomas R. Watters, published in the May issue of *Nature Geoscience*.

"It's a great testament to the continued benefits of the Apollo program that seismic data collected over 40 years ago is helping to confirm that the moon is likely tectonically active today," Watters said. "The connection between the location and timing of shallow moonquakes and known young faults is further evidence that our moon is a dynamic world."

The Apollo 11, 12, 14, 15, and 16 astronauts placed seismometers—instruments that measure the shaking produced by quakes—at their landing sites. Four of the seismometers operated from 1969 to 1977 and recorded 28 shallow moonquakes. Watters is lead author of the study that analyzed data from these seismometers using an algorithm, or mathematical program, developed to pinpoint quake locations detected by a sparse seismic network. The new analysis gave a better estimate of the moonquake locations.



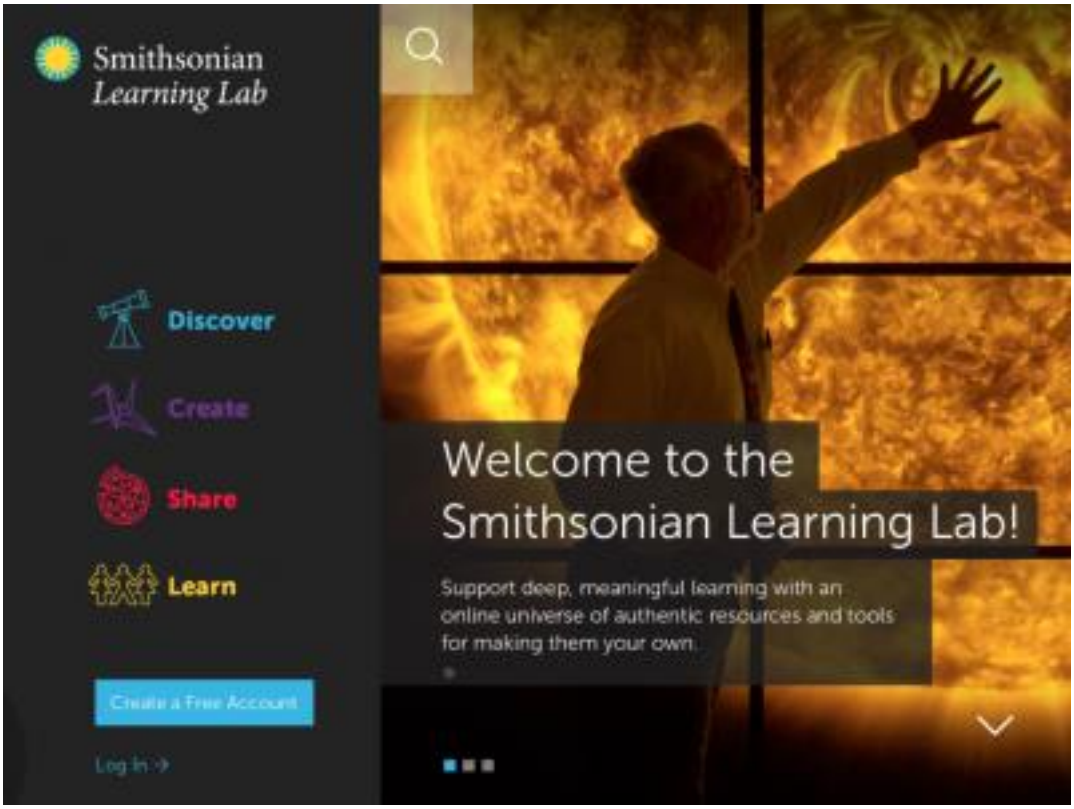
This prominent lunar lobate thrust fault scarp is one of thousands discovered in Lunar Reconnaissance Orbiter Camera ("LROC") images. The fault scarp or cliff is like a stair-step in the lunar landscape (left-pointing white arrows) formed when the near-surface crust is pushed together, breaks, and is thrust upward along a fault as the Moon

contracts. Boulder fields, patches of relatively high bright soil or regolith, are found on the scarp face and back scarp terrain (right-pointing arrows). *Credit: NASA/GSFC/Arizona State University/Smithsonian*

SMITHSONIAN LEARNING LAB NAMED BEST EDUCATION WEBSITE

The **Smithsonian Center for Learning and Digital Access** has announced that its Smithsonian Learning Lab (learninglab.si.edu) was named the Best Education Website in the 23rd Annual Webby Awards. Hailed as the "internet's highest honor" by the *New York Times*, the Webby Awards, presented by the International Academy of Digital Arts and Sciences, is the leading international awards organization honoring excellence on the internet. The center and the Smithsonian Learning Lab were honored at the Webby Awards ceremony Monday, May 13, in New York City.

The Learning Lab, which launched in 2016, makes available more than 3 million digitized resources from across the Smithsonian's 19 museums, as well as its research centers, libraries, archives and the National Zoo. These resources and online collections offer new ways of learning for teachers and students, who, through digital tools, can customize and share collections to match their educational needs.

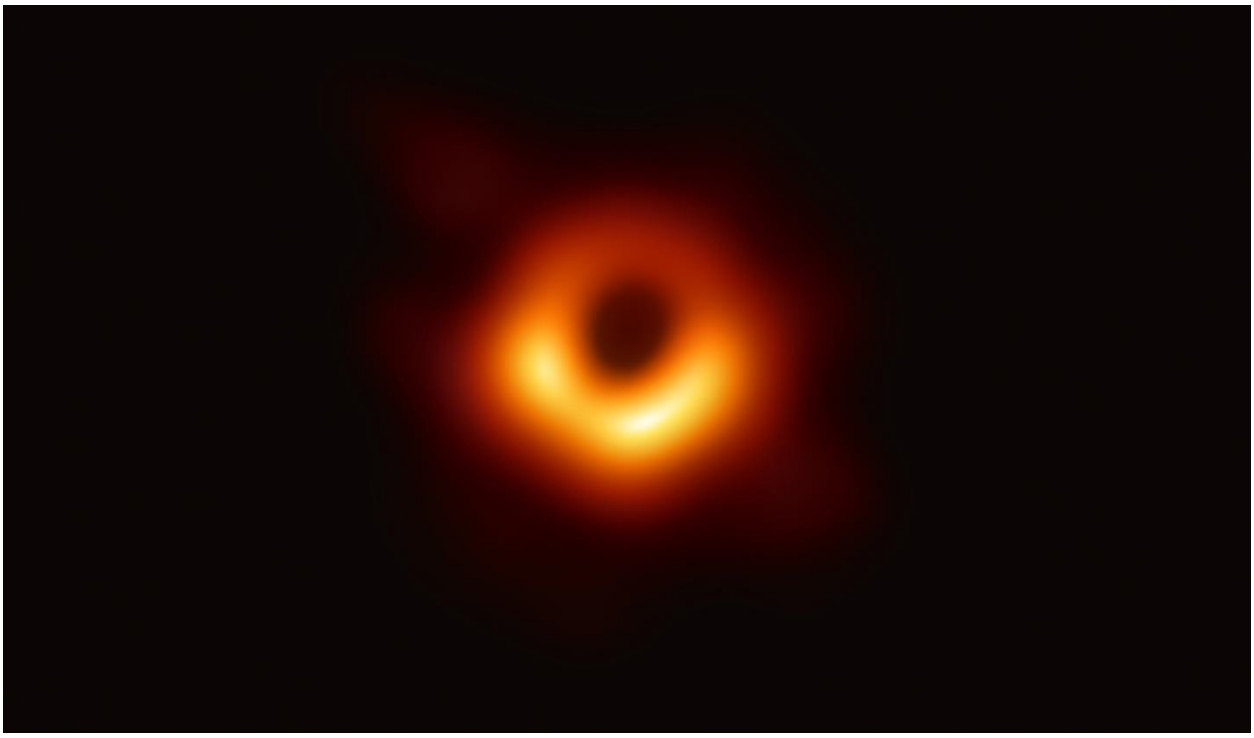


SMITHSONIAN PLAYS CRITICAL ROLE IN CAPTURING LANDMARK BLACK HOLE IMAGE

The first-ever image of a black hole was seen on April 10. This monumental achievement was made possible, in part, by key leadership and funding from the **Center for Astrophysics | Harvard & Smithsonian** ("CfA"). The Event Horizon Telescope, or EHT, is a global array of radio telescopes involving dozens of institutions and hundreds of scientists. The breakthrough discovery by the EHT is an image of Messier 87's "(M87's") supermassive black hole in the center of the Virgo galaxy cluster, 55 million light-years away. This black hole contains 6.5 billion times the mass of the Earth's sun.

Six papers were published in the *Astrophysical Journal Letters* to describe this groundbreaking result.
Black holes are extremely compressed cosmic objects containing extraordinary amounts of mass within a tiny region. This mass is shrouded by an event horizon, that is, the boundary beyond which nothing—not even light—can escape from the black hole's powerful gravitational pull.

The presence of these objects affects their surroundings in extreme ways, including warping space-time and heating surrounding material to hundreds of billions of degrees. General relativity predicts that a black hole will cast a circular shadow upon this bright, glowing material. The newly released image of M87 from the EHT reveals this shadow.



Credit: Event Horizon Telescope Collaboration