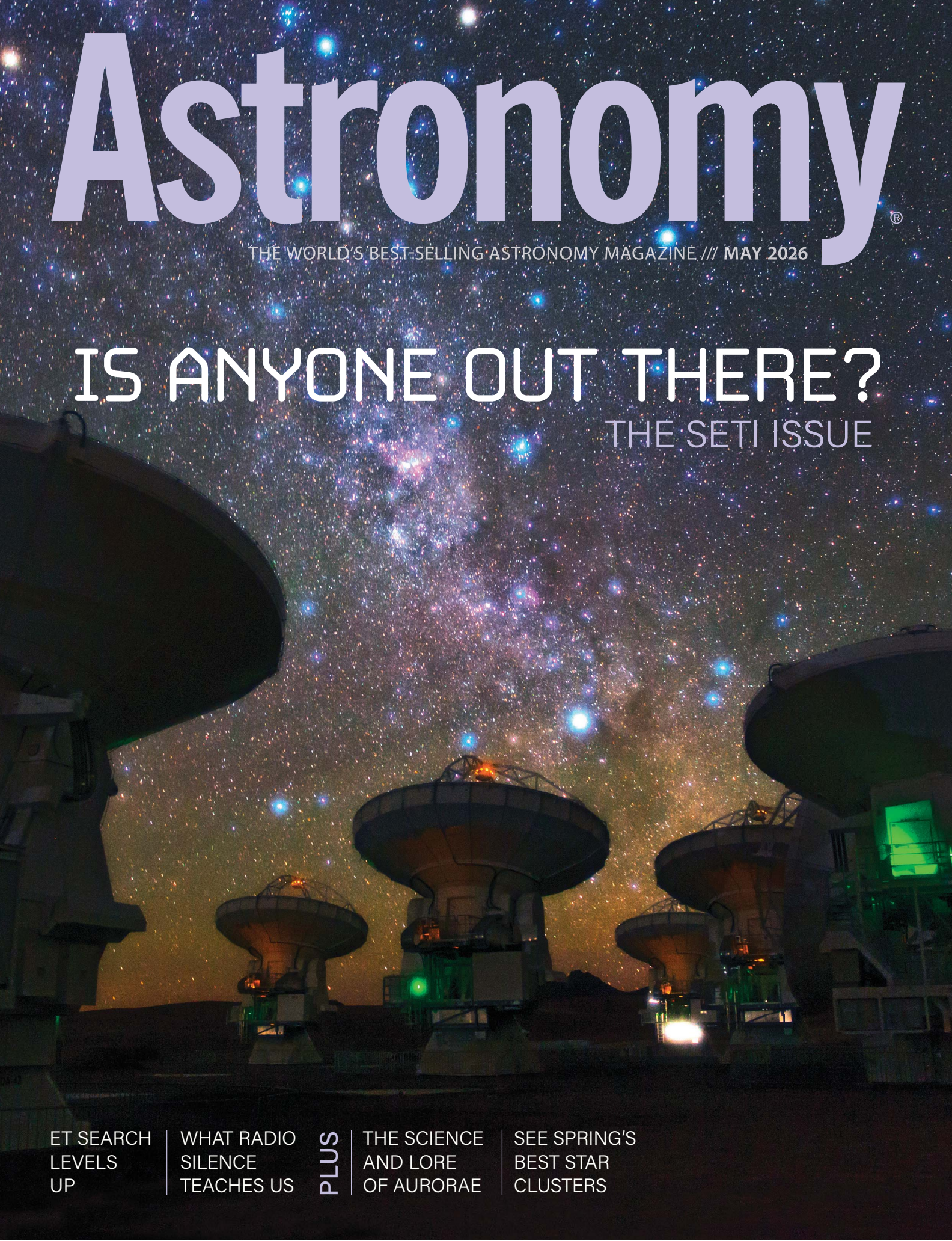
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SCHMIDT SCIENCES TO FUND FOUR NEW OBSERVATORIES

The philanthropic organization will build a space telescope and fund three ground-based facilities.

DESERT ARRAY. Telescopes of the Deep Synoptic Array stand at the ready in the Nevada desert in an artist's rendering. The DSA is one of three ground-based facilities Schmidt Sciences will fund. K. MILLER, A. MEJÍA (DSA)

ON JAN. 7, the Schmidt Sciences organization — funded by former Google CEO Eric Schmidt and his wife, Wendy Schmidt — announced it will build a space telescope larger than Hubble and fund construction of three ground-based observatories. All four facilities, called the Eric and Wendy Schmidt Observatory System, should be operational by 2029.

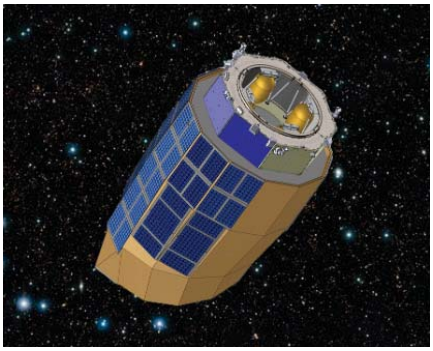
The news came at the annual winter meeting of the American Astronomical Society (AAS) in Phoenix and marks a major expansion of the Schmidts' philanthropic efforts in astronomy. "For 20 years, Eric and I have pursued philanthropy to seek new frontiers … committing our resources to novel research that reaches beyond what might be funded by governments or the private sector," said Wendy Schmidt in a statement.

WIDE-RANGING CAPABILITIES

A privately funded space telescope of this scale is unprecedented. Called Lazuli, its capabilities will "approach Hubble" but "for a ridiculously low price," said Pete Klupar, executive director of Schmidt Sciences and leader of the Lazuli engineering team, at the AAS session. Aiming to launch in 2028 with a 3-meter mirror and a coronagraph to block the glare of stars, Lazuli will observe exoplanets and study their atmospheres. It will also be designed to rapidly slew across the sky to catch cosmic explosions as they occur.

The ground-based facilities were previously in development by existing teams. The Argus Array, led by the University of North Carolina, will combine more than 1,000 small telescopes into one with roughly the collecting area of an 8-meter mirror, on par with existing large observatories. It will continuously observe the northern sky, quickly finding light from supernovae as well as events that create gravitational waves. The full array should be on sky in 2027, Argus team leader Nicholas Law said at the session, but he did not announce a location.

The Large Fiber Array Spectroscopic Telescope (LFAST) is designed for spectroscopy, including searching exoplanet atmospheres for biosignatures. Its mirrors are organized into subarrays of twenty 30-inch telescopes on a single structure. Team leader Chad Bender of the University of Arizona said the number of subarrays has not been determined. Each subarray has



SPACE SCOPE. Lazuli (seen in an artist's concept) is a privately funded space telescope larger than Hubble but will cost less, thanks in part to a shorter design cycle. SCHMIDT SCIENCES

the collecting area of a 3-meter telescope; they are aiming for the equivalent of a 30-meter-class telescope. The preferred site is Kitt Peak, with Mount Lemmon and Mount Hopkins as backups.

The Caltech-led Deep Synoptic Array (DSA) of 1,650 radio dishes will be built in Spring Valley, Nevada, using new astronomical radio receivers developed at Caltech that don't need complex cooling systems. The massive number of receivers will form a more complete combined beam than existing arrays, reducing the intensive data processing typically necessary to create radio imagery and allowing the capture of images in real time.

Arpita Roy, director of the Astrophysics and Space Institute at Schmidt Sciences, told *Astronomy* Lazuli will cost "hundreds of millions" of dollars. The combined budget for the three ground-based facilities is less than that, but "not small, either." All four projects are now officially proceeding.

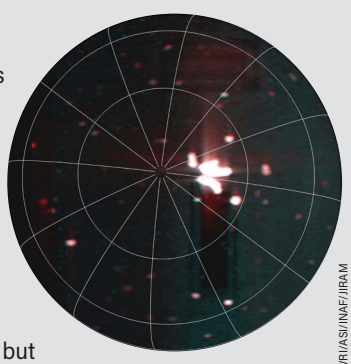
'COMPLEMENTARY AND ADDITIVE'

Schmidt leaders hope to show it is possible to build missions that embrace increased risk and launch quickly for less money. But the foundation does not intend to replace NASA missions or the National Science Foundation (NSF), which funds most U.S. ground-based astronomy. The projects are "meant to be complementary and additive," said Roy. She also said Schmidt is not intending to be a general funding agency.

Many astronomers were excited by the announcement. In particular, Schmidt Sciences' commitment to an open data model, with no reserved time for particular groups, is "very admirable," said Melodie Kao, a radio astronomer at the University of California, Santa Cruz. "One of the criticisms of private money is that you pick the winners and the losers. And so I commend them … for putting in the ground rules that the data will be public for everyone so that the whole community can benefit."

Kao also hopes the ground-based facilities will be funded for more than their announced lifespans of three to five years. "Pairing these observatories with the public assets built by NSF and NASA will be extraordinarily powerful," she said. "And also I hope that they'll be around for a while." – MARK ZASTROW

Io's most powerful volcanic eruption — ever



NASA/JPL-CALTECH/SWRI/ASI/INAF/JIRAM

TRAPPED BETWEEN the gravity of Jupiter and two of its fellow Galilean moons, Io is the most volcanically active body in the solar system. But a hot spot imaged in infrared light by NASA's Juno mission on Dec. 27, 2024, set a new record even for this amazing world. Located on the moon's southern hemisphere, the hotspot is larger than North America's Lake Superior. And according to NASA, its eruptions put out some six times more energy than all of Earth's power plants combined. Based on the data, researchers believe it isn't just one volcano, but several closely spaced ones, which indicates a huge system of magma chambers just beneath the surface there. Following the discovery, researchers tasked Juno with looking on future flybys for changes in the landscape caused by the immense eruption. – A.K.

QUICK TAKES

INNA IS OUTTA HERE

Energy giant AES Andes announced the cancellation of its controversial INNA project, which astronomers had warned would cause irreversible damage to the telescopes at ESO's Paranal Observatory and the Atacama Desert's dark skies.

NASA FULLY FUNDED

On Jan. 15, Congress passed a bill funding NASA with a $24.4 billion budget, rejecting the cuts proposed by President Trump, who signed the bill into law on Jan. 23.

SPONTANEOUS PEPTIDES

Scientists modeling the dust clouds where stars are born found that complex organic compounds like peptides — the precursors for proteins — can form spontaneously in space when simple molecules like glycine are bombarded by cosmic rays. This suggests the universe contains more of life's necessary building blocks than previously thought.

SHAKING THINGS UP

By collecting data from seismometers — originally designed to detect earthquakes — researchers can now track reentering space debris by the sonic booms it generates as it falls to Earth. This can help authorities quickly find debris on the ground and reduce potential contamination from hazardous materials.

ALAN SAYS 'ACHOO'

According to a new study, artificial light at night, or ALAN, can alter plants' biological cycles, making pollen season start earlier and last longer, increasing allergen exposure and posing a public health risk.

RUBIN MAKES HEADS SPIN

Among the 1,900 asteroids discovered in the First Look results released by the Vera C. Rubin Observatory last June, a new 0.3-mile-wide (0.5 kilometer) world was found to be spinning faster than any asteroid previously observed.

– BROOKS MENDENHALL