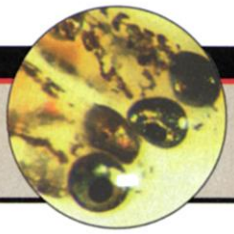

sweepstakes entry the highest. A 153,478-genes entry came in from Sam LaBrie of Incyte Genomics, a California-based company that in September 1999 announced that the human genome had at least 140,000 genes.

But Rubin and other gene minimalists were undeterred, arguing that complexity comes from how genes are regulated or expressed—not in the number of genes themselves. "We don't need large numbers of genes to be an intelligent species," Rosenthal explains. Weissenbach agrees, arguing that "once people go through the EST data, they will realize that many of the clusters [cover] the same gene." His bet: 28,700. And yours?

–ELIZABETH PENNISI

ASTRONOMY

Fly's Eye Spies Highs in Cosmic Rays' Demise

LONG BEACH, CALIFORNIA—On an October evening in 1991, an extraterrestrial intruder tore through the sky over North America. The interloper was a cosmic ray, a high-energy particle from deep space. Astronomers at the Fly's Eye observatory in Utah detected it as a flicker of light from the cascade of secondary particles it left in its wake. On analyzing the glow, they realized that the particle had packed a shocking 320 exa–electron volts (EeV) of energy, the same punch as an 88-kilometer-an-hour baseball pitch. Astrophysicists call it the "Oh-My-God" particle.

Now, observations from Fly's Eye's replacement have shown that the 320-EeV monster was not a freak of nature. This month at an American Physical Society meeting here, astronomers from the High-Resolution Fly's Eye detector, or HiRes, announced that they had found a handful of ultra-superhigh-energy cosmic rays that deepen the mystery about the origin of these strange particles.

Since it began operating in 1997, HiRes has nearly doubled the number of known ultrahigh-energy cosmic rays. It has recorded seven particles with energies greater than 100 EeV, including one that clocked in at an estimated 280 EeV, the second highest cosmic ray energy ever recorded. HiRes has also detected 13 other cosmic rays with energies over 60 EeV. "People are beginning to think these events are real," says Charles Jui, a physicist at the University of Utah in Salt Lake City.

They had reason to be skeptical. In the 1960s, scientists realized that particles with more than about 60 EeV of energy would tend to smack into the ubiquitous microwave background photons left over from the big bang. Such energetic collisions would produce pions, destroying the cosmic rays in the process. "You shouldn't expect these particles to survive for more than 20 to 50 megaparsecs," Jui says. As a result, physicists expected that there would be a sharp cutoff in cosmic ray energies at about 60 EeV, and any particles with energies above that level must have come from nearby. Such energetic particles, they thought, should be easy to trace back to their sources. The HiRes data don't show an abrupt 60 EeV cutoff, however, and no obvious sources have turned up for the superenergetic particles. Indeed, astrophysicists have trouble even figuring out what might give them such a punch. Supernovae, for instance, can't accelerate particles to more than about 1/1000 of an EeV of energy. "This is a burning astrophysical problem that needs to be solved," says University of Chicago astrophysicist Rene Ong.

Fly specs. Clusters of phototubes give HiRes an eye for cosmic rays.

Astrophysicists are hoping that HiRes, with its high sensitivity and ability to pinpoint a cosmic ray's direction and mass, will eventually provide the data that point to the answer. "Given that they've already doubled the sample, every few years they'll probably double it again," Ong says. "HiRes could make a very important statement."

–CHARLES SEIFE

CONSERVATION BIOLOGY

Orangutans Face Extinction in the Wild

LISLE, ILLINOIS—Orangutans, our third-closest living relative, are in crisis, reported several leading primatologists at a meeting here last week on apes.* Indeed, the plight of the orangutans, whose range is now restricted to the shrinking forests of Borneo and Sumatra, dominated the 4-day meeting and sparked two late-night sessions at which researchers and zookeepers hatched a conservation plan. Without urgent action, warns Biruté Galdikas, a biological anthropologist and conservationist who teaches at Simon Fraser University in Burnaby, British Columbia, the apes could be extinct in the wild within 20 years. The culprit is wholesale logging and other habitat destruction, which will be difficult to halt.

Ignorance is bliss. A young orangutan plays in the water, heedless of the threat.

Exact numbers are hard to come by because orangutans, highly intelligent but mostly solitary apes, hang out high in the forest canopy where they are difficult to spot. But two recent surveys, one of which was presented at last week's meeting, show clearly that populations are crashing. Carel van Schaik of Duke University and his colleagues estimated the size of orangutan populations in a section of the 24,000-km^2 Leuser region on Sumatra in 1993 and 1999. Relying on data from satellite imaging and aerial photos of the animals' habitat—combined with their own knowledge from 24 years of field-

* "The Apes: Challenges for the 21st Century," 10 to 13 May, Lisle, Illinois, sponsored by the Brookfield Zoo.

CREDITS: (TOP) MICHAEL TURCO; (BOTTOM) D. BIRD