

Will Curiosity find 'Martians'?

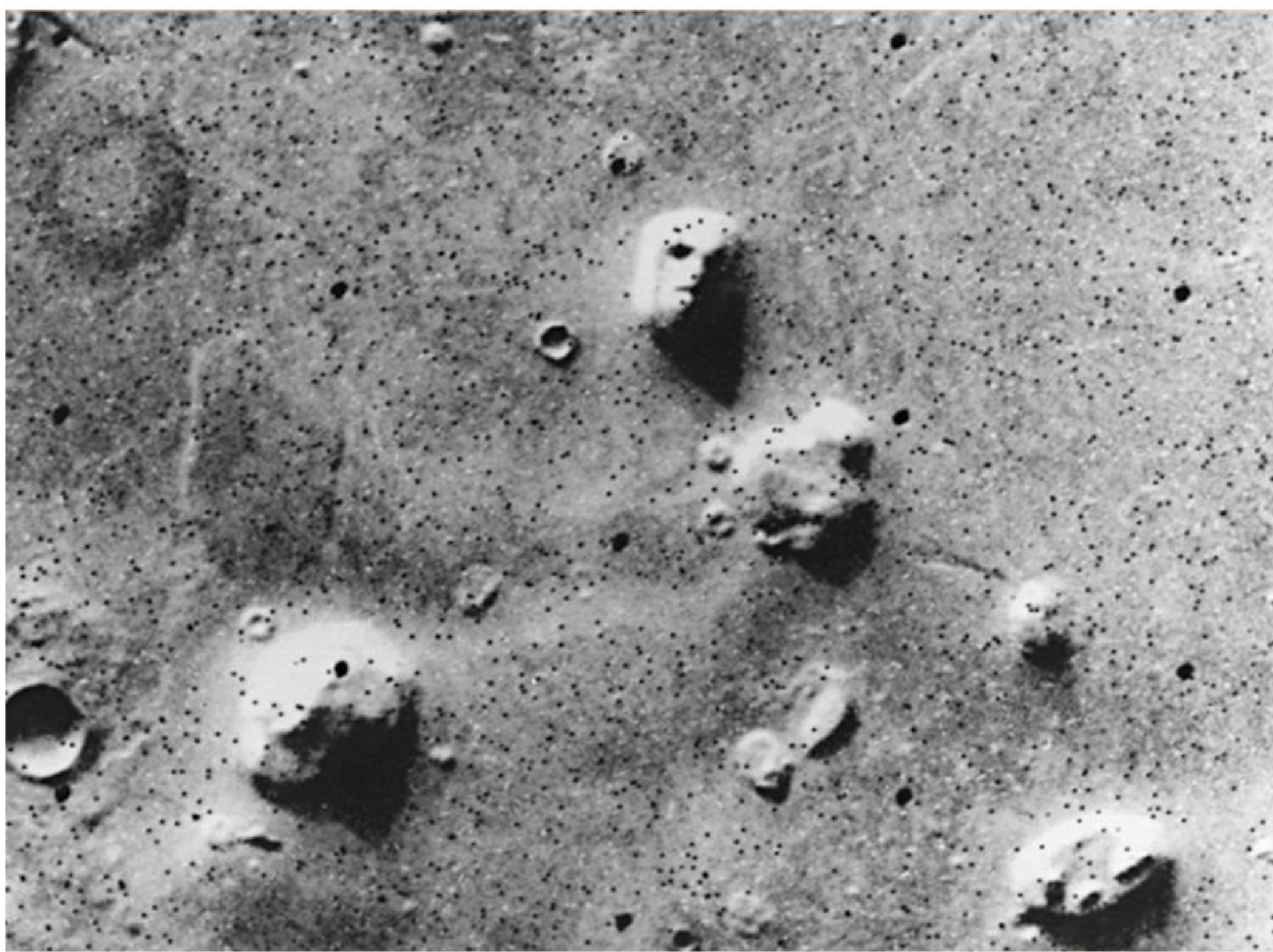
WITH the rover Curiosity now safely on Mars, the world will be seeing lots of video in the coming months and years from the planet's surface.

The six-legged, nuclear-powered \$2 billion robot has already sent back images of Gale Crater where it landed, and it's soon on its way toward a 3-mile-high mountain nearby. Scientists and indeed the entire world are watching with bated breath to see what Curiosity can find as it spends the next two years digging, sampling, probing, and analyzing on the Red Planet's rocky surface.

Many will also be looking for evidence of life on Mars, and Curiosity may provide it even if it's not there. NASA footage has long been fodder for UFO buffs and conspiracy theorists who comb through countless photos and hours of video looking for evidence of alien life (or evidence that NASA is covering up evidence of extraterrestrials).

Indeed, NASA images have previously been claimed to show evidence of Martian life.

A man named Richard Hoagland claimed that 1976 photographs of the Cydonia region of Mars showed a human-like face. The so-called "Face on Mars" rose to international fame as Hoagland waxed speculatively about the significance of the stunning find: Was it a sign for us from extraterrestrials? Where were the builders of this magnificent monument? On April 5, 1998, the Mars Global Surveyor took photographs of the same region in far higher resolution than was possible in 1976. The new images clearly showed an area heavily eroded, and that the "face" was simply the result of low image quality, the brain's tendency to see human forms and faces, and tricks of light and shadow. [5 Mars Myths and Misconceptions]



The original "Face on Mars" image taken by NASA's Viking 1 orbiter, in grey scale, on July 25, 1976. Image shows a remnant massif located in the Cydonia region.

In 2001 an amateur astronomer found what he believed to be a mysterious rectangular structure on the surface of Mars while looking at a program called Google Mars featuring satellite images of the planet. Professional astronomers explained that it was in fact an artifact created by the interference of cosmic rays; the anomalous shape was created in

ity, the brain's tendency to see human forms and faces, and tricks of light and shadow. [5 Mars Myths and Misconceptions]

History and human psychology tell us that sooner or later, one or more of the thousands of images beaming to us from Curiosity 352 million miles away will contain some glitch, anomaly, or trick of light that will be interpreted by someone as evidence of Martians. Of course it's possible that the rover will find real, actual evidence of life on Mars but it probably won't be in the form of alien bases.

the camera, not on the surface of Mars.

Photos of the surface of Mars taken by the NASA robot Spirit in 2008 were said to show a humanlike figure. Several Internet sites posted the image and suggested the figure could be alive, sparking speculation and controversy. The real explanation, according to astronomer Phil Plait of the Bad Astronomy website, is that "The rock on Mars is actually just a few inches high and a few yards from the camera. A few million years of Martian winds sculpted it into an odd shape, which happens to look like, well, a Bigfoot!"

Then in 2010 a team of psychics led by Courtney Brown, a researcher at Emory University, claimed to have found evidence not only of life on Mars in NASA photos, but also a large industrial dome and a plume of waste coming from it. In a video presentation titled "Evidence of Artificiality on Mars," Brown claimed to have found "a very large dome that is highly reflective, it looks like it's made of some sort of resin material." Needless to say, no other evidence of an alien dome has ever been found.

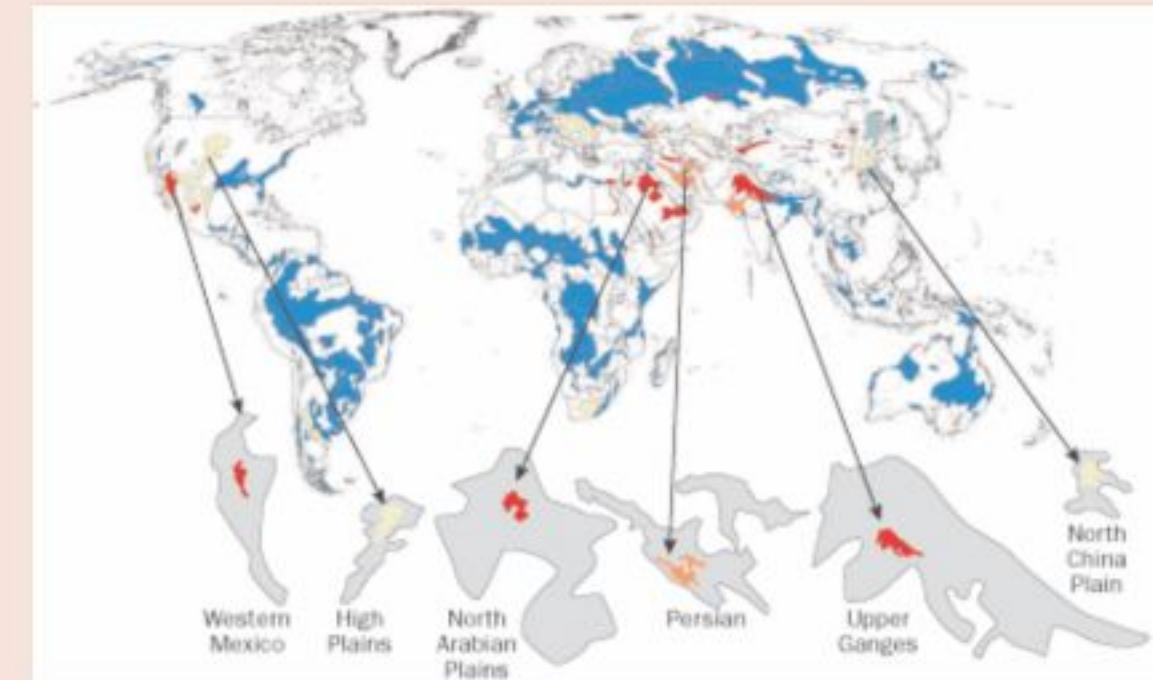
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Source: Live Science



OVERTAPPED

Groundwater level dips globally



Overuse of just a few global aquifers (red, yellow, orange) is straining the world's groundwater supply.

A handful of thirsty countries are guzzling their groundwater reserves much faster than those resources can be renewed.

India, Pakistan, Saudi Arabia, Iran, Mexico, and the United States lead the global pack of water-thirsty nations, researchers report online August 8 in Nature. Irrigation for agriculture drives much of the demand, says hydrogeologist and study coauthor Tom Gleeson of McGill University in Montreal.

He and colleagues devised a new "groundwater footprint" measure to evaluate the sustainability of withdrawals from the world's aquifers. The analytic tool balances water coming in with water going out, and gauges how large an aquifer would have to be to accommodate current withdrawals. A groundwater footprint larger than its aquifer means people are sucking down water faster than it can be replenished treating it as a nonrenewable resource, Gleeson says.

Though 80 percent of the world's aquifers have sustainable footprints, people drawing on other aquifers are draining the world's water supply. For these overtapped reservoirs, groundwater footprints vastly exceed aquifer areas. "It's not sustainable," Gleeson says. "We don't know how long the aquifers will last."

Source: Science News



MANY ROOTS

Nonlinear ancestry of man



A nearly 2 million-year-old lower jaw discovered recently in East Africa, along with other new finds.

NEWLY discovered face and jaw fossils show that at least two species of the human genus Homo lived alongside each other in East Africa nearly 2 million years ago.

These new finds are a good match for a roughly 2 million-year-old Homo brain case and face excavated in 1972 in the same part of East Africa, reports a team led by anthropologist Meave Leakey of the Turkana Basin Institute in Nairobi, Kenya. Long considered a puzzling exception among early Homo finds, the 1972 discovery features big bones and a flat, upright face and represents a species apart, Leakey and her colleagues conclude in the Aug. 9 Nature.

Until now, researchers have found it difficult to exclude the possibility that the large-faced fossil known as KNM-ER 1470 came from a male of the same species as smaller, early Homo finds in East Africa.

"After so many years of questions about the identity of the enigmatic 1470 fossil, the chances that it's from a separate species have greatly improved with our new discoveries," says anthropologist and study coauthor Fred Spoor of the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany.

Leakey and her colleagues unearthed the new fossils from 2007 to 2009 along the shore of Kenya's Lake Turkana. Previously dated volcanic ash layers at the site place the finds at between 1.78 million and 1.95 million years old.

Source: Science News



ALIEN CRYSTAL

Extra-terrestrial origin of quasicrystals

RESULTS from an expedition to far eastern Russia that set out to find the origin of naturally occurring quasicrystals have provided convincing evidence that they arrived on Earth from outer space.

Writing in IOP Publishing's journal Reports on Progress in Physics, Paul J Steinhardt and Luca Bindi reveal that new, naturally occurring quasicrystal samples have been found in an environment that does not have the extreme terrestrial conditions needed to produce them, therefore strengthening the case that they were brought to Earth by a meteorite. Furthermore, their findings reveal that the samples of quasicrystals were brought to the area during the last glacial period, suggesting the meteorite was most likely to have hit Earth around 15 000 years ago.

"The fact that the expedition found more material in the same location that we had spent years to track down is a tremendous confirmation of the whole story, which is significant since the meteorite is of great interest because of its extraordinary age and contents," said Steinhardt.

In their report, Steinhardt and Bindi describe the expedition in which ten scientists, two drivers and a cook travelled 230 km into the Koryak Mountains of far eastern Russia to pan one and a half tons of sediment by hand, and survey local streams and mountains.

The group of researchers were on the look-out for naturally occurring quasicrystals -- a unique class of solids that were first synthesized in the laboratory by Israeli scientist Dan Shechtman in 1982. He was awarded the Nobel Prize for Chemistry in 2011 for this discovery.

The concept of quasicrystals was first introduced by Steinhardt and his student Dov Levine. Until their work, it had been believed that all solids, synthetic or natural, form ordinary crystals -- materials whose entire structure is



New, naturally occurring quasicrystal sample.

made of a single-type cluster of atoms that repeat at regular intervals, joining together in much the same way as identical tiles in bathroom tiling.

It was also thought that crystals could only have two-, three-, four- and six-fold symmetries; however, Steinhardt and Levine found a new theoretical possibility, which they dubbed quasicrystals. A quasicrystal has two or more types of clusters that repeat at different intervals with an irrational ratio, which allows all the symmetries that were thought to be forbidden, such as five-fold symmetry, to be possible.

Since their discovery in the laboratory, researchers have created over one hundred artificial quasicrystals that have been used in a variety of applications, from non-stick frying pans and cutlery to ball bearings and razor blades.

Only one natural quasicrystal has been previously documented: a sample in the Museum of Natural History in Florence, Italy, that was located and identified by the two co-authors and

their collaborators in 2009. They found the sample to have the symmetry of a soccer ball, with six axes of five-fold symmetry forbidden to ordinary crystals. This triggered a remarkable investigation to find the place where the sample came from, which, as Steinhardt states, involved secret diaries, smugglers, gold prospectors and bears.

Eventually, the researchers found the person, Valery Kryachko, who had removed the sample from a remote area of Chukotka in the Russian mountains back in 1979.

In the summer of 2010, the researchers' experiments indicated that the sample was meteoritic and had come from not just any type of meteorite, but a CV3 carbonaceous chondrite -- a 4.5 billion-year-old meteorite formed at the beginning of the solar system.

"Now there was real motivation to turn this fantasy trip into a reality. It was a long shot, but if we could find even one sample there, it would prove the bizarre story we had put together beyond any shadow of doubt and provide new sources of material for studying this very strange meteorite that formed at the beginning of the solar system," Steinhardt continued.

Now that Steinhardt, Bindi and their expedition team have collected even more samples from the original site in Chukotka, there are a number of questions that can now be answered with further investigation.

"What does nature know that we don't? How did the quasicrystal form so perfectly inside a complex meteorite when we normally have to work hard in the laboratory to get anything as perfect? What other new phases can we find in this meteorite and what can they tell us about the early solar system?"

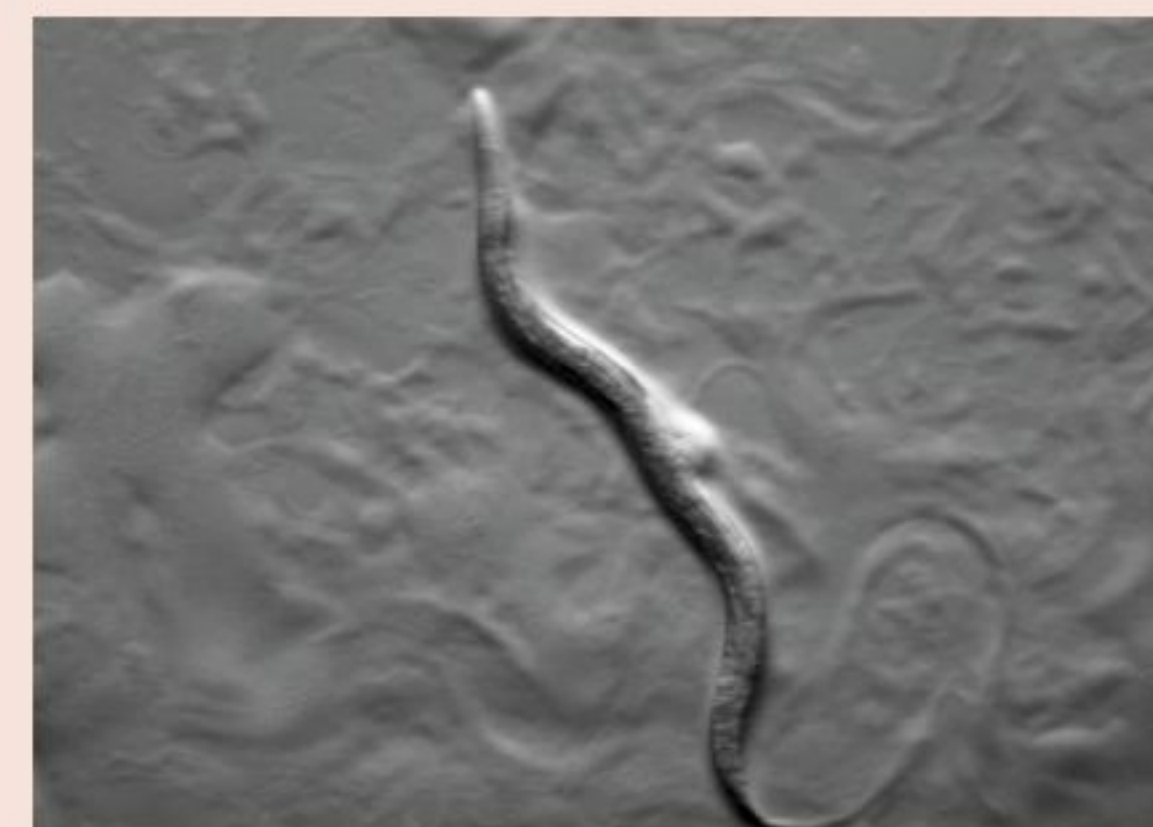
"At the moment, we are at the tip of the iceberg," said Steinhardt.

Source: Science Daily



NATURAL ERRORS?

Selfish DNA in animal!



Roundworm with "selfish" DNA. This roundworm has been found to have "selfish" mitochondrial DNA - a biological oddity never before discovered in an animal.

RESEARCHERS at Oregon State University have discovered, for the first time in any animal species, a type of "selfish" mitochondrial DNA that is actually hurting the organism and lessening its chance to survive -- and bears a strong similarity to some damage done to human cells as they age.

The findings, just published in the journal PLoS One, are a biological oddity previously unknown in animals. But they may also provide an important new tool to study human aging, scientists said.

Such selfish mitochondrial DNA has been found before in plants, but not animals. In this case, the discovery was made almost by accident during some genetic research being done on a nematode, *Caenorhabditis briggsae* -- a type of small roundworm.

"We weren't even looking for this when we found it, at first we thought it must be a laboratory error," said Dee Denver, an OSU associate professor of zoology. "Selfish DNA is not supposed to be found in animals. But it could turn out to be fairly important as a new genetic model to study the type of mitochondrial decay that is associated with human aging."

DNA is the material that holds the basic genetic code for living organisms, and through complex biological processes guides beneficial cellular functions. Some of it is also found in the mitochondria, or energy-producing "powerhouse" of cells, which at one point in evolution was separate from the other DNA.

The mitochondria generally act for the benefit of the cell, even though it is somewhat separate. But the "selfish" DNA found in some plant mitochondria -- and now in animals -- has major differences. It tends to copy itself faster than other DNA, has no function useful to the cell, and in some cases actually harms the cell. In plants, for instance, it can affect flowering and sometimes cause sterility.

"We had seen this DNA before in this nematode and knew it was harmful, but didn't realize it was selfish," said Katie Clark, an OSU postdoctoral fellow. "Worms with it had less offspring than those without, they had less muscle activity. It might suggest that natural selection doesn't work very well in this species."

That's part of the general quandary of selfish DNA in general, the scientists said. If it doesn't help the organism survive and reproduce, why hasn't it disappeared as a result of evolutionary pressure?

Source: Science Daily



BLUE MARBLE



Our sweet home

This gorgeous image is the most up-to-date "blue marble" photo of our home planet. Released this week, it's the latest in a long line of color images of Earth that date back to the Apollo space missions. The original "blue marble" shot was taken by the crew of Apollo 17 in 1972. Today, satellites are snapping some of the most spectacular photos of Earth. This new image was taken by Suomi NPP, NASA's most recently launched Earth-observing satellite. It's a composite of many images of the planet's surface taken on Jan. 4, 2012.



DO YOU KNOW?

What is a UFO?

An unidentified flying object (UFO) is an object which is observed in the sky, but cannot be identified. While people have been spotting mysterious objects in the sky for centuries, claims of UFO sightings exploded in the wake of the Second World War. Attitudes about UFOs vary widely, with some people believing that such objects have a perfectly logical scientific explanation, while others have suggested that the origin of UFOs is paranormal in nature. People who support a paranormal explanation for UFOs are sometimes referred to as "believers," referencing the idea that they believe in paranormal phenomena.



Grainy B&W image of supposed UFO, Passoria, New Jersey