

DAVID A HARDY/AP

This image shows an impression of the possible scene from a moon of a planet orbiting around the star HD 70642, some 94 light years from Earth in the Milky Way galaxy. The star is similar to the Sun in structure and brightness and appears to be about the same age.

The Toronto Sun, Wednesday October 15, 2003

## Scientists work on stairway to heaven

LOS ALAMOS, N.M. (AP) — Some scientists at Los Alamos National Laboratory want to build an elevator reaching 100,000 km into the sky to launch payloads into space more cheaply than the shuttle can.

“The first country that owns the space elevator will own space,” said lab scientist Bryan Laubscher. “I believe that, and I think Los Alamos should be involved in making that happen.”

Some researchers are working on their own

time on technical details.

Five to 10 scientists at any given time are analyzing the economics, technical specifications of how the elevator would work and possible health risks to those using it.

### 32-million storey shaft

The elevator shaft would be made of a very strong, thin, lightweight material called carbon nanotubes attached to the Earth’s equator. The shaft, a 32 million-storey-tall cable,

would be carried into orbit on a conventional spacecraft, then gradually dropped down to Earth to be attached to a platform similar to an ocean oil-drilling rig.

Solar-powered crawlers would move up and down the shaft, carrying payloads of satellites or probes to be placed in Earth’s orbit or beyond.

They also would attach additional cables to the main shaft that eventually would become new elevators.

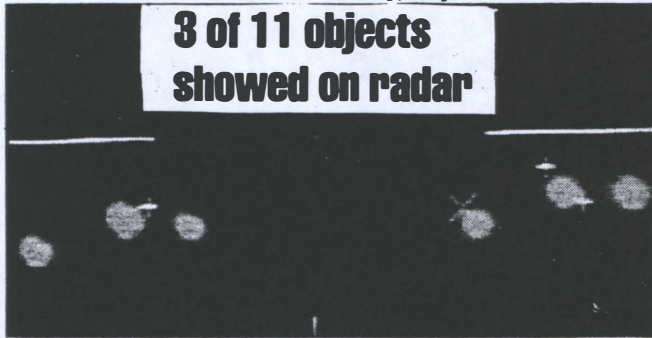


**MEXICAN AIR** force pilots filmed 11 unidentified flying objects in the skies over southern Campeche state, a defence department spokesman said in Mexico City yesterday.

A videotape made available to the news media shows the bright objects, some sharp points of light and others like large headlights, moving rapidly in a late-evening sky.

The lights were filmed March 5 by pilots using infrared equipment. They appeared to be flying at an altitude of about 3,500 metres and allegedly surrounded the air force jet as it conducted routine anti-drug trafficking vigilance. Only three of the objects showed up on the plane's radar.

"Was I afraid? Yes," said radar operator Lieut. German Marin in a taped interview made public yesterday. "A little afraid because we were facing something that had never hap-



■ **THIS IMAGE** made from video filmed by Mexican air force shows rapidly moving unidentified flying objects.

pened before."

"I couldn't say what it was ... but I think they're completely real," added Lieut. Mario Adrian Vazquez, the infrared equipment operator.

The captain, Maj. Magdaleno Castanon, said the jets chased the lights "and I believe they could feel we were pursuing them." When the jets stopped

following the objects, they disappeared, he said.

"This is historic news," Jaime Maussan, a Mexican investigator who has dedicated the last 10 years to studying UFOs, said yesterday. "Hundreds of videos (of UFOs) exist, but none had the backing of the armed forces of any country." — AP

## Black hole or neutron star?

JELANI LOWE  
Toronto Sun

**TWO YORK** University researchers have discovered what they believe to be evidence of a new black hole or neutron star.

Senior research associate Michael Bietenholz and Professor Norbert Bartel used a network of radio telescopes from around the world to discover signs of a dense object at the centre of a supernova roughly 30 million light years from Earth.

The researchers are particularly excited about their discovery due to its confirmation of long-held theories about the universe.

**"The exciting thing is actually seeing this process as it happens and then being able to watch as it evolves ..."**

— Michael Bietenholz

"It has long been thought a dying star leaves behind a very compact object that's either a neutron star, which is a very dense star, or a black hole, but we haven't actually seen that happen before," explained Bietenholz, 44.

"The exciting thing is actually seeing this process as it happens and then being able to watch as it evolves in the early stages of its life."

Bietenholz explained that elements, critical to the creation of life and planets like Earth, are released during the explosion of a supernova.

But as to whether the object they discovered is a neutron star or black hole, it's still too early to tell. Bietenholz said they will likely have to wait for the gases released in the supernova to further disperse, but added that he had no preferences for the outcome.

"That's like if I were expecting a child, and someone were to ask me would you prefer it to be a boy or girl?" he said. "I'd be pretty happy with either one."

The Toronto Sun • Friday, June 4 • 2004

## Fire in the sky confirmed

**SEATTLE** — A meteor about the size of a computer monitor flashed across the skies of the U.S. Northwest yesterday, setting off booms that stunned witnesses. The Naval Observatory said it was apparently a bolide — a meteor that appears like a fireball in the sky.

The Toronto Sun • Thursday, June 10 • 2004

## Embryo of flying dinosaur

**LONDON** — Scientists in China have discovered a 121 million-year-old fossil containing an embryo of a flying reptile that lived alongside the dinosaurs. It is the only known fossil of an embryo of a pterosaur, a winged lizard that evolved powered flight.

The Toronto Sun • Friday, May 14 • 2004

**A SERIES** of brightly lit, rapidly moving objects filmed in the skies over Mexico could have been caused by a scientific phenomenon involving gases in the atmosphere, a scientist said yesterday in Mexico City.

Visible only with infrared equipment, the fast-moving lights were captured by Mexican air force cameras March 5 but made public only this week, sparking speculation they were flying saucers.

Julio Herrera, a nuclear science researcher at Mexico's National Autonomous University, said the bright blurs could have been caused by electrical flashes emitted by the atmosphere.

"They are a very strange phenomenon and there is little information about them," Herrera said in a phone interview. "That's what's so interesting."

## Gases in atmosphere: Researcher

He said more data than is available on the videotape is needed to determine if that hypothesis is correct, including information on atmospheric conditions at the time the lights appeared.

### Burning gas

The Campeche coast on the Gulf of Mexico, where the objects were filmed, is Mexico's main oil- and gas-producing region. Oil platforms release or burn off some of the gas they produce.

The objects were recorded flying at more than 3,300 metres over southern Campeche state using a video camera equipped with an infrared lens. Infrared equipment can only detect heat

emanating from objects; it is unable to provide an image of the objects' exact form.

"As far as public opinion goes, it's much more interesting to believe in fantasy and for us it's the opposite," Herrera said, adding he and other scientists are working to "try to determine a rational explanation for all this."

In the videotape, first aired on Mexican national television Monday night, the objects appear to accelerate rapidly and change course suddenly. At least one crew member testified the objects surrounded the air force jet when they were at least 3 km away. The pilot sighted the objects as they conducted a routine drug-surveillance mission. — AP

## UFO spotted over Winnipeg

APRIL 20, 2004

Three air traffic controllers at the Winnipeg International Airport are among witnesses who reported seeing an unidentified flying object streak through the sky in March.

They say they saw the object March 28 about 9:45 p.m., flying at more than 400 kilometres an hour from west to east.

There are about 700 documented UFO sightings each year in Canada.

metr THURSDAY, APRIL 29, 2004

## UFO sightings grip Iran

Flying-saucer fever has gripped Iran after dozens of sightings in the past few days.

Yesterday, state television showed a sparkling white disc it said was filmed over Tehran on Tuesday night.

But Sa'dollah Nasiri-Oeydari, head of the Astronomi-

cal Society of Iran, said the stories were unfounded.

He said what people reported was consistent with the planet Venus, whose intense light in its current position would be given different hues by being filtered through the atmosphere.

Reuters



# Are there parallel worlds?

**W**e live in three dimensions: You can go north-south, east-west or up-down. Simple enough. If you add one more dimension for time — as Albert Einstein suggested — that's four altogether.

That's plenty for most of us. And, until recently, it would have been enough for most physicists as well. But the past few years have brought a flurry of new ideas about the structure of the universe, and physicists are now contemplating multi-dimensional worlds that put our seemingly-three-dimensional surroundings to shame.

It all starts with string theory, which attempts to unify gravity with the other forces of nature. In the string picture, the most fundamental "bits" of matter are not point-like particles but rather one-dimensional loops of string. But to make the theory consistent — to make the math work out — string theory relies on a framework involving extra dimensions.

"String theory is the only theory we know about that consistently puts in quantum mechanics and gravity, and it necessarily has other dimensions," says Lisa Randall of Harvard University.

"It just doesn't work if the theory is fundamentally 3-plus-1 dimensional," that is, if the theory contains only three dimensions for space plus one for time.

"So if string theory really is the right theory, there are these extra dimensions. And the question isn't, 'Why are they there?' The question is, 'What happened to them?' What are their consequences? Do they do anything useful?"

The answer to that first question — what happened to the extra dimensions — seems to be straightforward: They're all around us, but hidden from view. That is, they're thought to be "curled up" on scales far too small to see.

As an analogy, think of a drinking straw: Seen from far away, it looks like a one-dimensional stick. Only when we see it up close does the other dimension — the circular direction around the straw's circumference — reveal itself.

The difference between strings and the drinking straw is merely one of scale: String theory's hidden dimensions may fold in on themselves over distances as short as  $10^{-33}$  centimetres (that's a decimal followed by 32 zeros and then a 1) — more than a billion billion times smaller than an atomic nucleus.

However, theorists have recently suggested that the folding might happen on a larger scale, maybe approaching millimetre-size.

The original version of string theory was weird enough, but, in the 1990s, physicists came up with a refined version known as M-theory. In the new picture, one-dimensional strings give way to higher-dimensional membranes, or "branes" for short.

As theorists investigated the properties of these branes, they found that not all of the extra dimensions needed to be curled up. Some of them, in fact, could be infinite.

That was big news for cosmologists, who had been used to thinking of a three-dimensional cosmos that started off with a big bang about 14 billion years ago. Before long, there were new models of the universe inspired by M-theory — and they make our familiar three-dimensional cosmos seem almost dull by comparison.

These new "brane world" models offer a startling new description of the cosmos. In some of the scenarios, the entire visible universe is merely a "3-brane" — a three-dimensional membrane — embedded in a larger structure, called the "bulk," which has at least four space dimensions (and, as usual, one more for time).

Of course, no one can envision four dimensions, so if you want to picture what these brane worlds are like, it's best to imagine a simpler model in which one of the dimensions is stripped away. Now, our universe becomes a two-dimensional sheet and the bulk becomes ordinary three-dimensional space.

The remarkable part of the theory is that there's no reason to presume that our universe — our 3-brane — is unique. There could be any number of "parallel" branes nestled alongside ours in the four-dimensional bulk. Think of a series of parallel sheets of paper suspended alongside one another.

Why don't we notice these other branes? Theorists believe that most of the known physical forces operate only within a particular brane. For example, we can't see these parallel branes because light is governed by electromagnetism; photons of light are trapped, stuck on the surface of our brane. The same goes for the nuclear forces that operate within atoms. Matter, too, is confined: We can't fly a spaceship into another brane world.

The only exception seems to be gravity: It is thought that gravity can "leak out" of the brane, perhaps allowing scientists in one brane — one universe — to infer the presence of a parallel brane.

If the theory is right, it could ex-

plain the mystery of the "dark matter" that has puzzled astronomers for decades, the mystery of why much of the universe seems to be composed of something other than normal, luminous matter such as stars and galaxies. The missing matter, physicists speculate, could simply be ordinary matter on one of these parallel branes. Any light it emits will remain trapped in its own world, but its gravity reaches across to ours.

"The only way these branes interact is through gravity," says Paul Steinhardt of Princeton University, a pioneer in developing brane-world cosmologies. A heavy object on a parallel brane "would draw matter [from our brane] towards it — but we couldn't touch, feel, or see it," he says. "So it would seem to us to be a kind of dark matter. In fact, maybe the dark matter is matter on this other brane."

The case is obviously still speculative, Prof. Steinhardt says, "but it seems like a natural possibility."

In 2001, he and his colleagues developed a particular brane-world picture that they called the "ekpyrotic" model of the universe. (The name comes from a Greek word meaning "cosmic fire.")

In the ekpyrotic picture, the big bang is recast in an entirely new light. Instead of a primordial explosion marking the beginning of time, it may have been a collision between our brane and a parallel brane that triggered the formation of matter in our universe. In other words, the big bang was not the beginning; it was merely a transition from one cosmic epoch to another.

Prof. Steinhardt later went a step further, suggesting that such collisions happen at regular intervals, producing a repeating cycle of "bangs" and "crunches." His "cyclic model" brings to mind oscillating-universe models of past decades — only now the idea seems to have the support of string theory and M-theory.

"Imagine a force between these two three-dimensional worlds that would tend to draw them together, as if they were two rubber sheets being drawn together by a spring," he says. "At regular intervals, they would come together, smash together, creating a certain amount of heat — which we would think of as radiation and matter — and then bounce apart."

Many prominent physicists seem intrigued, if not entirely persuaded, by brane-world scenarios such as the ekpyrotic and cyclic models. Cambridge physicist Stephen

Continued on the following page



# Hawking alters black hole view

Hawking, once skeptical of extra dimensions, now routinely discusses brane worlds in his papers and at conferences (his most recent public lectures have been titled "Brane New World").

Of course, the idea of extra dimensions would be merely philosophy (with a heavy dose of mathematics thrown in) if there were no way to test it. But theorists believe that there may be at least three ways of indirectly detecting these extra dimensions.

First, because gravity seems to be intimately linked to the structure of space, they would like to examine gravitational interactions at both the very shortest and the very longest distance scales.

For example, any deviation from Isaac Newton's "inverse-square law" — in which doubling the distance reduces the force to one-quarter — would hint at the presence of hidden dimensions.

Physicists would also like to take a closer look at "gravitational waves," the stretching and shrinking of space produced by any massive object that is accelerating. The first gravitational-wave detectors are only now entering operation; eventually, they may reveal waves from high-energy cosmic events such as colliding black holes.

But these exotic waves may be seen indirectly by another method: It is thought that gravitational waves washed through the early universe, and they may have left their imprint on the cosmic microwave background radiation, the

faint microwave "echo" of the big bang. If the background radiation can be scrutinized in close enough detail, it may reveal signatures of those ancient gravitational waves, and, perhaps, allow physicists to distinguish between brane-world and conventional big-bang scenarios.

Finally, extra dimensions may reveal themselves in experiments at particle accelerators such as the Large Hadron Collider now under construction at CERN, near Geneva. In certain kinds of collisions, some of the particles produced could seem to disappear, carrying energy off into one of the hidden dimensions.

"Extra dimensions are a compelling field now," says Joe Lykken of the Fermilab particle accelerator near Chicago.

While the idea of extra dimensions used to be on the fringes of physics, he says there might soon be hard data to support — or refute — such ideas. "You can actually go out and do experiments now and verify these models, or rule them out. That's what makes this an exciting field right now."

*Dan Falk's book, Universe on a T-Shirt: The Quest for the Theory of Everything, was the winner of this year's Science in Society Journalism Award from the Canadian Science Writers' Association.*

THE GLOBE AND MAIL  
SATURDAY, JANUARY 3, 2004

**AFTER 29 years of thinking about it, Stephen Hawking has decided to admit he was wrong about the digestive habits of black holes.**

The renowned Cambridge University scientist presented a paper in Dublin yesterday arguing that black holes, the celestial vortexes formed by collapsing stars, can eventually reveal details about the objects they swallow up.

Hawking had previously insisted that black holes destroy all molecular fingerprints of their contents and emit only a generic radiation.

But yesterday, at the 17th International Conference on General Relativity and Gravitation, Hawking presented a series of mind-boggling new calculations that suggest black holes are able to cast out their contents "in a mangled form" — and that there's only one way in and one way out.

Hawking, 62, also said he no longer believes a 1980s theory that black holes might offer passage into another universe, a rival explanation for identifying where matter and energy go when consumed by a black hole. — AP

metr

WEDNESDAY, APRIL 28, 2004

## Myth: Bermuda is located in the Bermuda Triangle.

**Fact:** The Bermuda Triangle — mythical site of all manner of bizarre ship and airplane disappearances over the years — actually starts south of the island, well beyond the path of Canadians travelling there. Nevertheless, the spooky characterization of the region still rangles islanders. "The Bermuda Triangle," said one, "is the size of Texas. Please tell me that no one has ever disappeared in Texas!"

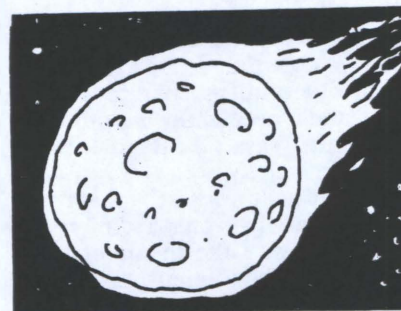
metr FRIDAY, JUNE 4, 2004

## Meteorite passes B.C.

A meteorite streaked across the clear skies above Washington and British Columbia yesterday, callers and astronomers reported, with some reporting sonic booms and a bright flash.

"It was a natural phenomenon and not a piece of re-entering space debris," said Geoff Chester of the U.S. Naval Observatory.

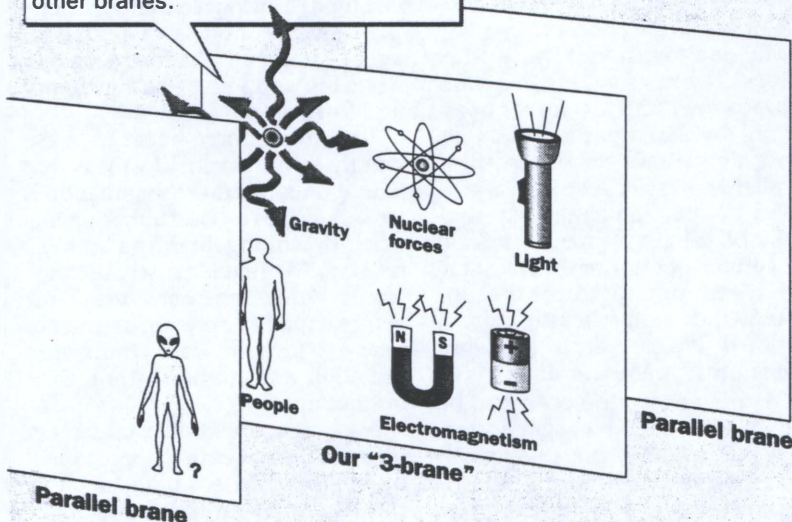
A meteorite breaking up in the atmosphere probably caused the flash, said Jeremy Tatum of the Canadian Space Agency's Meteorite and Impact Advisory Committee.



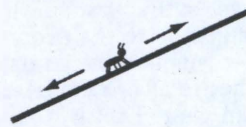
## 'Brane new world'

Our entire visible universe (electromagnetism, nuclear forces and matter itself) may exist on a "3-brane", a three-dimensional membrane embedded in a larger structure called the "bulk". There may be other parallel brane worlds we can't see.

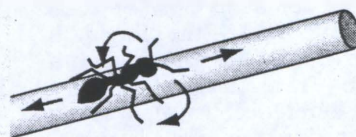
Gravity is the one force that may leak out of our brane, and may interact with other branes.



## Hidden dimensions



From a distance, an ant on a drinking straw appears one-dimensional, with the ant only able to move forward or backward.



Closer up, the straw's second dimension — circumference — appears, allowing the ant to move circularly. String theory claims our universe may have 10 spatial dimensions, with all but three curled up like the drinking straw's circumference.



# North Star?

## ASTRONOMICAL FALLACY

**I**n Shakespeare's *Julius Caesar*, the title character declares, "But I am constant as the Northern Star, of whose true fixed and resting quality there is no fellow in the firmament." In modern astronomical terms, Caesar was saying that he was an unstable guy. Astronomers have known for some time that Polaris, the North Star, sitting almost directly over the North Pole, is a Cepheid variable, a type of star that is caught in a cycle of bloating and collapsing because it has exhausted its hydrogen fuel. In this unsettled state, Polaris brightens and dims every four days or so, and over time, its pulsations have been slowing, the period of oscillation lengthening eight seconds a year. At a meeting this week of the American Astronomical Society in Denver, astronomers reported that Polaris is even unsteadier than they had thought. Even Polaris' average brightness has not remained the same, reported Dr. Edward Guinan of Villanova University. When he and Scott Engle, an undergraduate, checked older records, they found more surprises. In the 1800s, Polaris appeared to be 20% less bright. In the 1500s, Tycho Brahe recorded an even dimmer value. Ptolemy of Alexandria in his star catalogue of AD 140 listed Polaris as a third magnitude star. Magnitude is a scale devised by the Greek astronomer Hipparchus around 120 BC ranking stars from bright (1) to dim (6), a system still in use today. Today, Polaris is a second magnitude star. A change of a full magnitude would mean Polaris is 2.5 times as bright as it was 2,000 years ago. "That's unusual," Guinan said. "It shouldn't be changing that fast." Guinan and Engle also looked at the work of the Persian astronomer al-Sufi around AD 900, who made his own observations and corrected Ptolemy's errors. Because al-Sufi also reported Polaris as third magnitude, "it makes me believe that this could be correct," Guinan said. Meanwhile, David Turner of St. Mary's University in Halifax, said Polaris was much closer than had been thought. His research indicates Polaris is 310 million light-years away. The current accepted distance to Polaris is 430 million light-years. If Turner is correct, his findings offer an explanation for why Polaris appears as bright as it does. *Kenneth Chang, The New York Times*

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# Atlantis may be buried off coast of Spain, scientist says

BY RANDY BOSWELL

A German scientist with satellite images of what appear to be man-made features buried in mud on the southern Spanish coast believes he may have found the lost city of Atlantis.

But with a competing theory set to be tested this summer at an underwater site off Cyprus, the controversy surrounding one of history's most enduring mysteries isn't likely to end just yet.

The latest alleged location for Atlantis is a river delta near the city of Cadiz in the Andalusian region of Spain, about 100 kilometres northwest of Gibraltar at the mouth of the Guadalquivir River.

"Satellite photos of Andalusia show two rectangular structures which could be remnants of the temples of Atlantis described by Plato," Rainer Kuhne, a physicist at the University of Wuppertal in Germany, writes in the June edition of *Antiquity*. "If the capital of Atlantis indeed existed near the mouth of the Guadalquivir, then we suggest that Plato's Atlantis tale is based upon an Egyptian report on the Sea Peoples."

The legend of Atlantis was first documented by Plato about 400 BC. Believed to be drawing on stories originating with an Egyptian priest, Plato described Atlantis as a wealthy and highly advanced civilization wiped out long before his own time by a catastrophic flood.

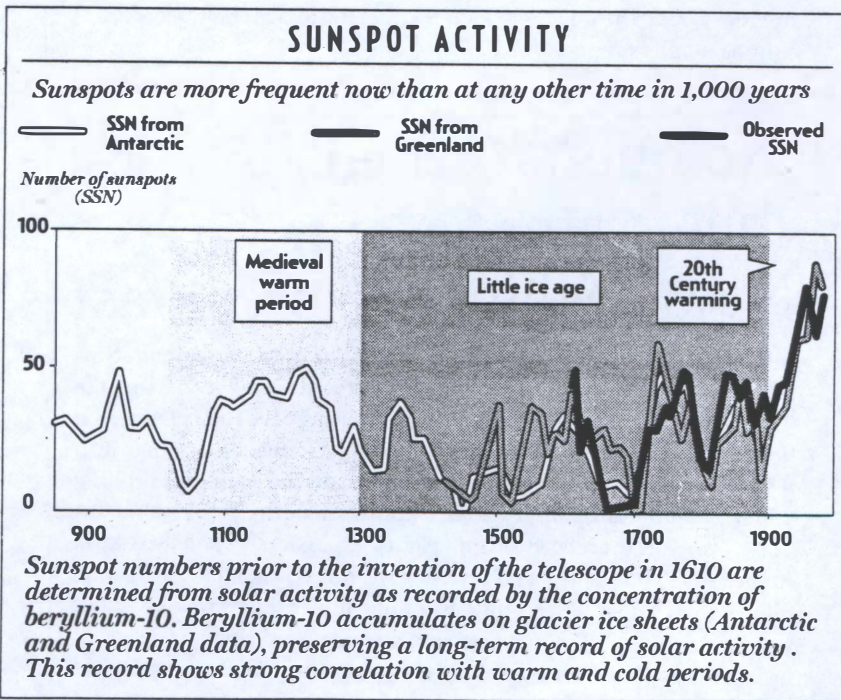
Over the centuries, scores of scientists and more than a few pseudo-scholars have claimed credit for discovering the true location of Atlantis. Last fall, self-described American mythologist Robert Sarmast published a book in which he argued remnants of Atlantis will be found in waters off the coast of southern Cyprus. He was expected to lead an expedition to the site this summer.

But Mr. Kuhne said yesterday his analysis of Plato's description of the centre of the fabled civilization most closely matches the geographical features around Cadiz. He believes the faint landscape features evident on his satellite pictures correspond with the "silver" temple and "gold" temple Plato said were at the centre of their spectacular capital.

"This is exactly what Plato wrote about the temples of Atlantis," Mr. Kuhne insisted. "Plato reported these two temples are surrounded by several rings, concentric circles, of alternating water and earth. The largest of these circles is 25 'stadia' — about five kilometres. What can be seen on the satellite photos is that the rectangular structures are in the midst of several concentric circles, the largest of which has a diameter of between five and six kilometres. So it fits very well with Plato's description of the city of Atlantis both in size and the geometry."

*CanWest News Service*

FINANCIAL POST, TUESDAY, JUNE 15, 2004



SOURCE: ILYA USOSKIN (NEW SCIENTIST, 2003)

NATIONAL POST



## Two residents of Yukon report seeing Sasquatch on Alaska Highway

Two Yukon residents have reported seeing something resembling a sasquatch earlier this week. Marion Sheldon and Gus Jules, members of the Teslin Tlingit Council, were travelling along the Alaska Highway southeast of Whitehorse on an ATV, sometime after 1 a.m. on Sunday when they passed what resembled a person standing on the side of the highway. Thinking it was a local from their small community who might be in need of a ride, they turned around and headed back, conservation officer Dave Bakica said. Mr. Jules said he saw what he believed to be flesh tones hidden beneath a mat of hair. "They are convinced this was something out of the ordinary," Mr. Bakica said. "I have no doubt in my mind that they believe what they saw was a Sasquatch. Whether it was or not, I do not know. Just because you can't prove something was there, does not mean it was not there." *The Canadian Press*

NATIONAL POST, SATURDAY, JUNE 12, 2004

## Alberta farmer's 'strange-looking' rock is a meteorite

Gerald Goldenbeld always knew the "strange-looking" rock he picked up 12 years ago was odd, but he didn't realize how out-of-this-world it was. Mr. Goldenbeld, who farms near Fort Macleod in southern Alberta, picked up the rock while he was baling straw back in 1992. Some recent Internet research led him to believe he was sitting on a meteorite, so he decided to take his rock to the University of Calgary to have it identified. "When you looked at it, you weren't really sure what it was," he said. The 1.5-kilogram Belly River Buttes meteorite, named for the area near where it was found, is just the 15th space rock recovered in Alberta. Alan Hildebrand of the University of Calgary estimates six recoverable meteorites land in Alberta every year — but few are recovered. The university's Prairie meteorite search project is running again this summer. *The Canadian Press*

NATIONAL POST, MONDAY, JUNE 14, 2004

## No one 'crowned' by meteorite that interrupts New Zealanders' breakfast

Sunday breakfast in a family home in suburban Auckland, New Zealand, was delayed yesterday when a meteorite crashed through the living-room ceiling. The grapefruit-sized black space rock plunged on to a leather sofa in Phil and Brenda Archer's home at more than 100 metres per second, before bouncing back up to the ceiling and rolling under a computer table. "I was in the kitchen doing breakfast about 9:30 a.m. and there was this almighty explosion," a shocked Mrs. Archer said. "It was like a bomb had gone off. I couldn't see anything, there was just dust. Then Phil saw a stone under the computer, and it was hot to touch.... I'm just glad that no one was sitting on the couch because they would have got absolutely crowned." Their one-year-old grandson had been playing nearby moments before the impact. "He must have a guardian angel," Mrs. Archer said. *The Daily Telegraph*

## Orbiting telescope discovers a 'baby'

ONLY A MILLION YEARS OLD

Possible new planet found circling star in constellation Taurus

BY DEBORAH ZABARENKO

The youngest planet ever detected — a baby less than 1 million years old — may have been discovered by NASA's Spitzer Space Telescope, astronomers say.

The possible infant planet was spotted circling a star known as CoKu Tau 4, some 420 light-years away in the constellation Taurus, according to astronomer Dan Watson of the University of Rochester, New York.

A light-year is about 10 trillion kilometres, the distance light travels in a year.

Researchers have identified more than 100 extrasolar planets — those found outside our solar system — but generally these objects were thought to be a billion years old or more. Earth and its immediate planetary neighbours are all about 4.5 billion years old, well into middle age.

This possible planet was detected by examining the dusty disk around the star CoKu Tau 4, where scientists found a doughnut-like hole in the dust. The putative planet may have formed by scooping together this dust, scientists said at a briefing at NASA headquarters.

"The object is only a million years old," Dr. Watson said. "That

probably makes it the youngest planet that we've ever seen, and young enough that it really causes problems for the major theories of planetary formation."

One theory of planetary formation holds that planets form when small objects called planetesimals slam together and stick, gradually building up a planetary mass. A planet made by quickly collecting itself from the planetary dust around a star is a different way of looking at the problem, and would allow for planets to form much earlier in the process.

The discovery of the possible infant planet was one of three findings by the Spitzer spacecraft, which looks at the universe through infrared light as it trails Earth in its journey around the Sun.

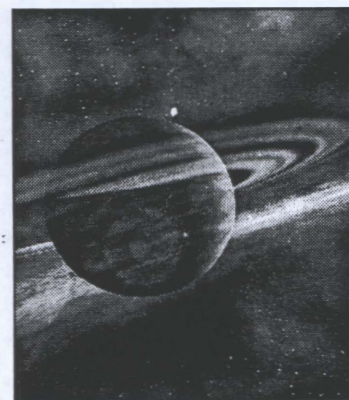
Spitzer also found significant amounts of icy organic material in the dusty disks surrounding other infant stars, which could give a clue to the origins of icy bodies such as comets, often described as dusty snowballs in space.

This finding is significant because some astronomers believe comets may have brought water to Earth, along with life-enabling materials.

These kinds of materials have been detected in space but this is the first time they have been clearly detected in the dust of planet-forming disks.

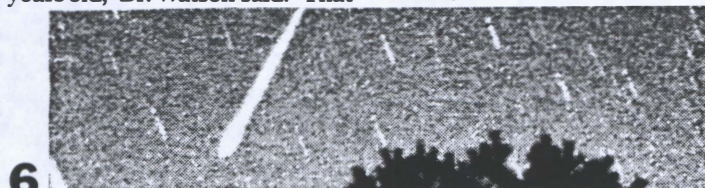
Spitzer also uncovered more than 300 newborn stars in a stellar nursery called RCW 49, about 13,700 light-years from Earth in the constellation Centaurus.

Reuters



NASA / REUTERS

An artist's conception of the youngest planet ever found, a "baby" less than a million years old detected in the constellation Taurus.





# Solar storms may have blown away all water on Mars, researchers suspect

## 'WHERE DID IT GO?'

BY DEBORAH ZABARENKO

WASHINGTON • Solar storms, like a big one that affected Earth last year, might have torn away the water that used to cover parts of Mars, NASA scientists said yesterday.

Astronomers believe Mars once had oceans of surface water, enough to support long-ago life, but they have not determined how that water vanished, about 3.5 billion years ago, or where it went.

Now researchers monitoring the after-effects of a monster solar storm that hit Earth last October and November say they think repeated buffeting by this kind of space weather could have ripped away Mars' watery veil.

"These [solar] radiation events

can affect the surface of Mars because Mars has so little protection," said Ed Stone of NASA's Jet Propulsion Laboratory in Pasadena, Calif.

Unlike Earth, which is protected by a magnetosphere that absorbs much of the bombardment of high-energy particles during a solar storm, Mars has only isolated zones of protection, astronomers said in a telephone-and-Internet briefing.

Observations by the Mars rovers Spirit and Opportunity have bolstered the idea of plentiful Martian water in the past, according to Thomas Zurbuchen of the University of Michigan at Ann Arbor.

The question Dr. Zurbuchen wants answered is: "Where did it go?"

"One of the key ideas that people are talking about is the connection to these space storms.... Over 3.5 billion years, there's kind of a gradual erosion of this water."

The astronomers referred to a video simulation of what might have happened on Mars, which shows water seemingly blowing away from the planet.

Scientists worked with a small fleet of robotic spacecraft to watch the impact of last year's "Halloween" solar storm, the most powerful ever monitored.

The storm's effects on Earth were severe enough to cause the rerouting of aircraft, affect satellite operations and precipitate a power failure in Malmoe, Sweden. Long-distance radio communications were disrupted because of the effects on the ionosphere, and northern lights (aurora borealis) were seen as far south as Florida.

No NASA satellites near Earth were severely damaged by the storms, but astronauts on the International Space Station curtailed some of their activities and took shelter in the Russian-

supplied Service Module several times during the storm.

A fleet of spacecraft dispersed throughout the solar system gave scientists the best picture to date of the effects of solar blast waves as they spread through the solar system.

Starting with the SOHO spacecraft, which monitors the sun from its vantage point near Earth, the astronomers followed the solar blast wave with the Ulysses craft near Jupiter and the Cassini craft that just began orbiting Saturn.

The storms rocked the inner solar system from Mars to Saturn. The Mars Radiation Environment Experiment instrument on the Mars Odyssey spacecraft orbiting Mars was disabled by radiation. Ulysses and Cassini both detected radio waves from magnetic storms generated as the blast wave slammed into the vast magnetic fields around those giant planets.

The material launched by the huge solar storms blasted by Earth at eight million kilometres per hour and raced past spacecraft near Earth, Mars, Jupiter and Saturn on its way to the two relatively ancient Voyager spacecraft on the fringes of the solar system.

The Voyager probes, launched in 1977, saw the storm slow as it plowed into the outer heliosphere (a large bubble of space around the sun which is "blown up" by fast-moving solar wind).

The blast wave reached Voyager 2 at 11 billion kilometres from the sun on April 28 and continued toward Voyager 1 at 14.5 billion kilometres from the sun.

In the months ahead, the blast wave will crash into the heliopause, the tangible edge of the solar system, where the material ejected by the sun piles up against the wind from nearby stars.

The energy carried by the material will push the interstellar gas outward by as much as 640 million kilometres, about four times the distance from the sun to the Earth.

Such storms will have significant implications for explorers who venture outside the Earth's protective magnetic field, so scientists have been working for years to predict when these massive storms will erupt.

"Over many decades, improvements in weather forecasting have saved lives and property. Space weather forecasting is still in development, but is needed to better protect our space infrastructure and future human and robotic explorers," said Carl Walz, a senior planner at NASA headquarters in Washington.

Reuters, with files from Chris Wattie, National Post

The Toronto Sun • Monday, June 14 • 2004



— AP

■ EVIDENCE OF ice on Phoebe, one of Saturn's moons, has turned up in excellent images from the Cassini spacecraft.

## Way, way out photos

PICTURES TAKEN by the Cassini spacecraft during a flyby of Saturn's largest outer moon suggest the banged-up rock hails from the outer reaches of the solar system, a mission scientist said in Los Angeles yesterday.

The high-resolution photos show shiny patches, probably ice, on the battered moon Phoebe, which is dotted with overlapping craters. The ice probably was excavated from under the moon's surface as objects struck Phoebe over the eons.

"My suspicion, so far from what we've seen, is that it's a body from the outer solar system," said Carolyn Porco, leader of the Cassini imaging team.

### International mission

The internationally built Cassini spacecraft came within about 2,000 km of the dark moon on Friday as it prepares to enter a four-year orbit to study Saturn, its rings and 31 known moons.

The \$3.3-billion plutonium-powered spacecraft, which is carrying 12 science instruments and a probe, transmitted hundreds of images and data that scientists will pore over to determine Phoebe's mass, density and composition.

The bright patches on Phoebe's surface are one indication it is an icy body, Porco said.

Up next for Cassini is a trajectory correction scheduled for Wednesday to bring the spacecraft into position to become a satellite on June 30.

— AP



# NEW THEORY FOR CAUSE OF 'GREAT DYING'

## PRECEDES DINOSAURS

BY TOM SPEARS

OTTAWA • Long, long before a mass extinction wiped out the dinosaurs, there was an even more terrible time that scientists call the Great Dying.

Extinction befell 90% of the sea creatures and 80% of those on land during this period about 250 million years ago.

And now, NASA and a California scientist are proposing that a meteor caused the Great Dying when it hit — and vaporized — an area of the Indian Ocean off Australia. If so, it likely changed the entire planet's climate for perhaps the next million years.

The leading traditional theory about the Great Dying is that thousands of years of frequent volcanic eruptions choked the atmosphere with fumes that changed the climate.

The undersea area where the meteor is thought to have hit is called the Bedout High, some 320 kilometres off northwestern Australia.

Oil companies had drilled cores there in the 1970s, but the cores sat in storage, not attracting much scientific interest.

Then Luann Becker came along. The scientist from the University of California at Santa Barbara had been hunting through old geological formations in Antarctica, finding fragments of meteorite in a claystone formation called breccia, formed around 250 million years ago.

They also found a type of stone called shocked quartz there and in western Australia — a sign that something had hit the Earth with an enormous impact, different from anything that events on Earth (such as volcanoes) can create.

Finally, she started analysing the old drill cores, finding more evidence this apparent crater had been formed by an impact around the time of the Great Dying.

"The moment we saw the cores we thought it looked like an impact breccia," she said.

There was also evidence of an an-

cient rock layer that had melted into glass — which fits with the fireball a large meteor would cause.

Most scientists currently believe the dinosaurs died when a meteor hit Mexico's Yucatan Peninsula 65 million years ago.

Today in the journal *Science*, Becker argues that the Yucatan Peninsula cores from 65 million years ago are very similar to the Australian cores.

The possible impact crater at Bedout High is also associated with a time when volcanoes were far more active than they are today. And the one great continent that Earth had until then, called Pangea, was beginning to break into sections separated by oceans.

"We think that mass extinctions may be defined by catastrophes like impact and volcanism occurring synchronously in time," Becker said.

Whatever the cause of the Great Dying, the huge vacuum in Earth's pattern of life gave rise to the dinosaurs. Reptiles hadn't dominated until suddenly, with all the big hunters gone, they expanded and grew and ruled the Earth for 175 million years. Then they, too, died.

The next step, scientists say, will be to check more thoroughly whether the area is, in fact, a crater caused by the impact of something from space.

Can West News Service  
Ottawa Citizen

NATIONAL POST, FRIDAY, MAY 14, 2004

24 HOURS JUNE 14 2004

## Hello? Is there anybody out there?

Forget Internet postings, cellphone calls, greeting cards or newspaper classifieds. There's a new way to get your personal message to the whole universe — and perhaps even the afterworld — for less than \$25.

Through the use of radio waves that carry voice messages to outer space; a Pennsylvania company is enabling people to launch belated goodbyes to lost loved ones, words of comfort to missing pets or birthday wishes to a family member.

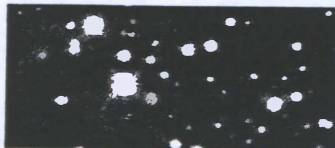
Tafton-based Endless Echoes, which began operation formally this month, allows people to

dial a telephone number and record a one-minute voice message. It's then lofted into space via a radio wave transmitted from Germantown, Md., and theoretically travels forever at 299,000 kilometres per second.

Rosie Pottebaum, 44, of Philadelphia, was one of founder Paul Forte's first test cases earlier this year. Pottebaum sent messages to her father, Arthur Szramoski, who died of a brain tumour in 1972 at 44, and her 21-year-old brother Arthur Szramoski Jr., who died in an accident the same year.

"The whole concept gave me the ability to say goodbye," Pottebaum said.

-The Associated Press



metro

FRIDAY, FEBRUARY 27, 2004

## Berry believes in ghosts

Halle Berry says she firmly believes in ghosts and has sensed the presence of one before, Ananova.com reports.

The actress, who is in Berlin promoting her new film *Gothika*, told German magazine *Bunte* she believes the dead come back to haunt the living.

"I absolutely believe in ghosts. I'm convinced the souls of the dead can come back to take care of things that were unresolved when they died," said Berry.

The star went on to say she has encountered a ghost before: "I've never seen one, but I've felt the presence of a ghost near me. At least I'd like to believe that."

Metro Toronto news services

## New planet may be youngest ever found

NASA's Spitzer Space Telescope may have discovered the youngest planet ever detected — less than one million years old — scientists reported yesterday.

The possible infant planet was spotted circling a star known as CoKu Tau 4, some 420 light-years away in the constellation Taurus, according to astronomer Dan Watson of the University of Rochester, N.Y.

A light-year is about 9.5 trillion kilometres, the distance light travels in a year.

Researchers have identified more than 100 so-called extrasolar planets — those found outside our solar system — but generally these

objects were thought to be one billion years old or more. Earth and its immediate planetary neighbours are all about 4.5 billion years old, well into middle age.

This possible planet was detected by examining the dusty disk around the star CoKu Tau 4, where scientists found a donut-like hole in the dust. The putative planet may have formed by scooping together this dust, scientists said at a briefing at NASA headquarters.

More information and images are available online at [www.spitzer.caltech.edu](http://www.spitzer.caltech.edu) and at [photojournal.jpl.nasa.gov](http://photojournal.jpl.nasa.gov).

metro FRIDAY, MAY 28, 2004