

Comet batters Jupiter

Huge chunks of ice, rock from SL9 begin seven-day planet barrage

GREENBELT, Md. (AP) — In a once-in-a-millennium spectacular, comet Shoemaker-Levy 9 is pummeling Jupiter with mountain-sized chunks of ice and rock, sending up towering fireballs and leaving black scars in the planetary clouds that may last for months.

Fragments A, B, C and D of the 21-piece comet slammed into Jupiter Saturday and Sunday, repeatedly exploding into fireballs that extend for 600 miles above the cloud tops.

The impacts are all behind Jupiter as viewed from Earth, but the bubbles of hot gases arising from each hit poke over the horizon and can be detected by large telescopes on Earth and by the Hubble Space Telescope.

"The fireball extends beyond the limb (visible horizon) of the planet," Heidi Hammel of the Space Telescope Science Institute said Sunday.

She was speaking of a Hubble image taken of fragment A's explosion. "This is a massive thing," she said.

Fragment C, about the same 0.6 mile diameter as A, smashed Jupiter about 4:45 a.m. EDT, and infrared photos from the Keck Telescope in Hawaii showed two glowing scars, each about the diameter of the Earth.

Fragment B is thought to have been much smaller and less compact. No images were released of that impact.

Fragment D views are not expected to be ready until Monday. But more are coming.

"This is just the orchestra warming up," said David Levy, an amateur astronomer and a co-discoverer of the comet.

Ahead are the largest four of the comet's train of 21 pieces.

Fragments G and H, which astronomers predict will hit on Monday, are both thought to be almost 2 miles across.

Fragments K, expected to collide Tuesday, and Q1, which hits on Wednesday, are also about 2 miles in diameter. The last fragment, called W, is forecast to hit on Friday.

Names of the fragments don't neatly follow the alphabet. Some fragments have disappeared, along

with their letter designation. Q split apart, giving rise to two pieces with that letter.

Scientists estimated that fragment A released energy equivalent to 10 million megatons of TNT when it slammed Jupiter at more than 130,000 miles per hour. Since the energy release increases geometrically, the larger fragments could have an explosive force of 10 times more.

Fragment A left a black scar in the Jupiter cloud tops that some scientists said could last months, or perhaps as long as a year, despite the extreme currents that stir the planet's stratosphere.

The explosive force of the comets comes from their size and their extreme velocity.

Eugene Shoemaker, U.S. Geological Survey astronomer and a co-discoverer of the comet, along with his wife, Carolyn, and Levy, said temperatures at the collision can reach tens of thousands of degrees.

Jupiter is almost all hydrogen gas, with only a relatively small central core. But as a high-speed comet fragment strikes, it creates powerful shock waves in the upper atmosphere and probably punches through a layer of ammonia clouds to a layer of dense hydrogen miles below.

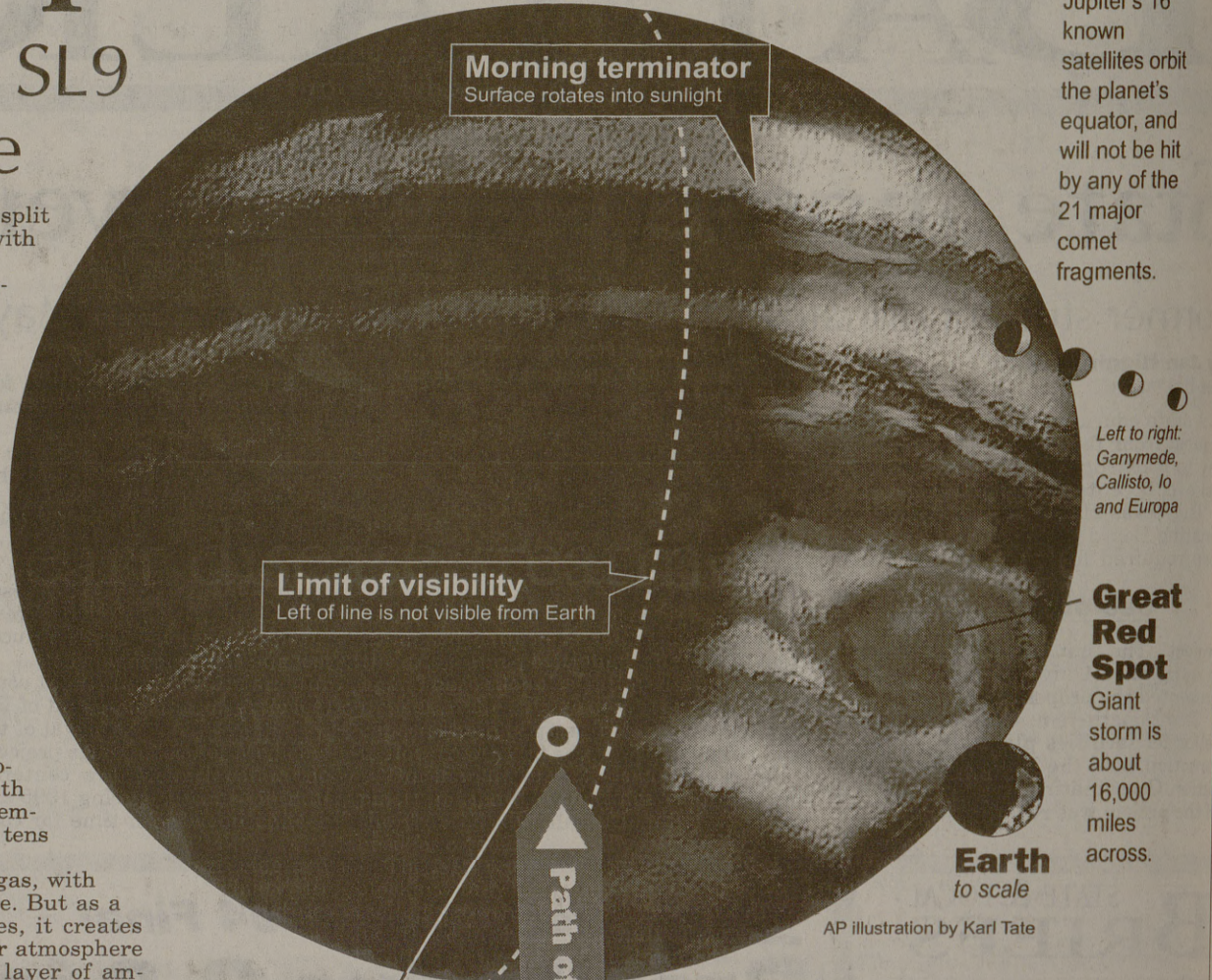
The shock waves create instant and extreme heat. Powerful forces of deceleration crush the comet fragments.

"Huge clouds rumble up and create a plume," said Levy. "That's what we call a fireball."

Target: Jupiter

Diameter: 88,730 miles
Rotation: 9 hours 51 minutes
Gravity: 2.69 times that of Earth

Moons
Jupiter's 16 known satellites orbit the planet's equator, and will not be hit by any of the 21 major comet fragments.



Left to right: Ganymede, Callisto, Io and Europa

Great Red Spot
Giant storm is about 16,000 miles across.

Earth to scale

AP illustration by Karl Tate

Impact zone

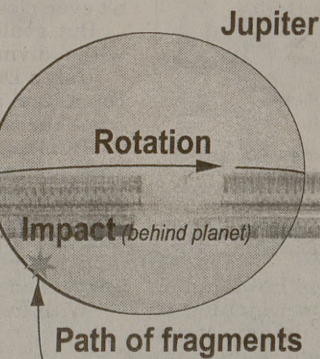
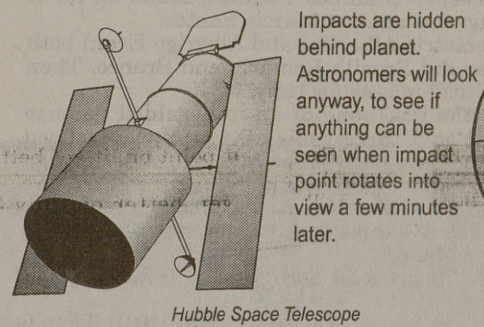
All fragments strike on the night side of Jupiter, out of sight of Earth. Impact areas rotate into view about 8 to 18 minutes later. Site rotates into sunlight 18 minutes after that.

Shoemaker-Levy 9

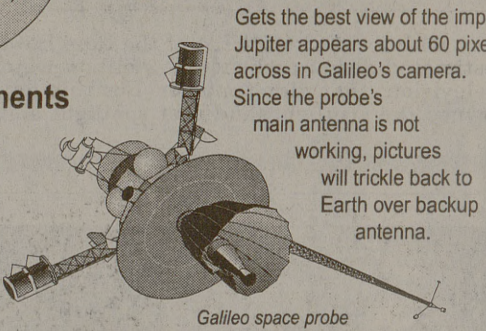
The comet was drawn into orbit around Jupiter at some time in the past (probably around 1970-72). It was shattered into 21 pieces by Jupiter's gravity in 1992. The train of fragments, currently more than 2.5 million miles long, is on course for smashing into the planet between July 16 and 22.

Looking for ringside seats

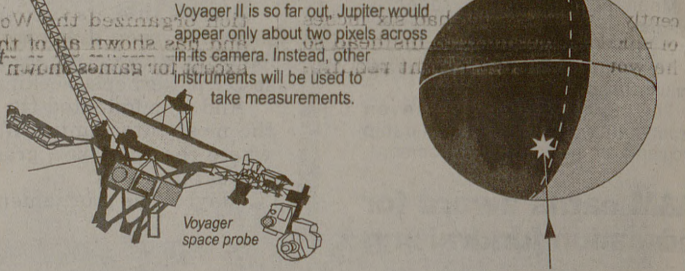
1 View from Earth



2 View from Galileo



3 View from Voyager II



Source: Paul Chodas and David Seal, Jet Propulsion Laboratory; Dan Bruton, Texas A&M University

Human virus may render heart disease treatment ineffective

WASHINGTON (AP) — Some blood vessels treated with coronary angioplasty may become blocked again by a natural reaction, a new study suggests.

The angioplasty treatment may be neutralized by the action of a common human virus against a gene that normally prevents the formation of cancers.

Scientists at the National Institutes of Health report today in the journal *Science* that cytomegalovirus may deactivate the cancer-defense gene and allow an overgrowth of smooth muscle cells inside arteries that have been opened by angioplasty, a procedure

that uses an inserted balloon to clear clogged arteries.

Earlier studies have identified the gene, called p53, as one of the body's defenses against cancer. Studies have shown that the gene's normal function is to limit the growth of cells. Missing or deactivated p53 has been linked to many human cancers.

Dr. Stephen E. Epstein, an NIH researcher, said the study in his lab should be considered only preliminary and not proof that the cytomegalovirus, or CMV, is the culprit in closing the treated arteries.

"We aren't there yet (with proof)," he said, "but the evidence does suggest this as a possible mechanism for restenosis (the re-closing of arteries) after angioplasty."

However, Baylor College of Medicine virologist Dr. Joseph Melnick called the NIH study "fascinating" because it indicates a possible link between cancer and heart disease.

Patients with blocked arteries are treated with coronary angioplasty. In this procedure, a tube is threaded up an artery until it comes to a site that is blocked by a heart disease process. A

collapsed balloon is then threaded up the tube and positioned at the blockage. The balloon is inflated and compresses the plaque material that caused the blockage. This allows blood to flow freely.

But in more than 25 percent of angioplasty patients, a blockage reforms at the treated site, often leading to the need for coronary artery bypass surgery.

The NIH team reasoned that the new blockage may be caused by an uncontrolled growth of smooth muscle cells like those in the artery wall. Angioplasty often causes a slight injury to the

artery and the vessel then heals itself by growing new cells.

It is possible, said Epstein, that the injury somehow activates CMV particles that are present, but latent, in the artery. This virus, he said, could attach to p53 and then shut down the gene's action.

When p53 is deactivated, said Epstein, smooth muscle cells repairing the artery are allowed to grow without restraint, forming a new blockage.

"There are a lot of theories about what causes this restenosis and ours is just one of them," said Epstein.

Hot tips to beat the heat

Too much heat can:

1 Cause heat stroke, the most dangerous of the heat-related illnesses. Symptoms include an inability to sweat, increased body temperature, dizziness, fainting and loss of consciousness.

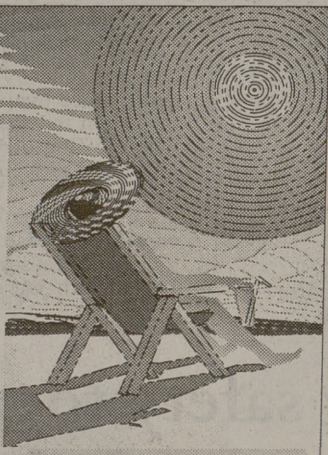
Get help immediately. Remove as much of the victim's clothing as possible. Sponge the skin with cool, not cold, water. Do not force liquid if victim is unconscious.

2 Cause heat exhaustion, the most common heat-related illness. Symptoms include clammy or sweaty skin, normal or slightly elevated temperature, rapid pulse, nausea and thirst.

Get out of the heat and rest. Restore fluids by drinking slowly. Gently apply wet towels to the body. Check with doctors to see if salt or medication is needed.

3 Cause heat cramps, the least serious of heat-related illnesses that untreated can lead to more serious problems. Heat cramps usually occur after exercise or physical labor. Symptoms include sweaty skin, weakness or nausea, tingling in the arms and legs.

Get out of the heat and rest. Drink cool liquids. Check with a physician to see if salt or medication is needed.



Cooling off:

- 1 Reduce physical activity.
- 2 When outside, stay in shade or wear wide-brimmed hat or use umbrella.
- 3 Use air conditioners or fans or go to places that have them.
- 4 Bathe or shower in cool water.
- 5 Drink plenty of liquids. Avoid alcohol, coffee and tea or other drinks that cause fluid loss.
- 6 Do not take salt tablets.

AP/Wm. J. Castello



HEALTH TIPS

Fitness fanatics beware obsessive regimens

By Lori Kuykendall

A.P. BEUTEL HEALTH CENTER

Many Texas A&M students are putting much of their time and energy into getting and maintaining the "perfect body."

Look in any of the local gyms from about 4 p.m. until midnight or watch all the people who are making no-fat or low-fat choices for meals and snacks.

As a young, well-educated population, college students are generally considered one of the healthiest segments of our nation.

Unfortunately, many students are becoming overly concerned about health and body image. Their drive to be healthy goes too far.

The result can be compulsiveness and obsession, which in turn can lead to a dangerous eating disorder or other emotional problems.

It is easy to gradually acquire a misconception of the difference between health and thinness.

Often a desire to become healthy becomes a desire to be too thin.

Such a crossover from health to exces-

sive eating and exercise can occur for many reasons.

Going away to college gives students a chance to become who they want to be and exercise new independence. A student wants to get a new body image and be a new person.

People trying to lose weight should do so moderately over time....They should not drop below 1200 calories a day.

It is encouraging to be able to go home for the holidays and have people give compliments about losing weight or having a new "college image."

Another cause of an over-obsession with body image can be perfectionism.

Often overachievers struggle with an extreme drive for perfection in academic areas, outside activities, and eating and exercising.

The danger comes when the balance shifts

from being "healthy" to being overly concerned and discontented about body image.

Any health textbook will define health as a balance of physical, mental, social, spiritual and emotional well-being.

It is important to reach and maintain a weight that will heighten physical health, but it is equally important to attain emotional well-being.

Part of being healthy is accepting natural body size. Most people cannot have extremely thin bodies.

There will always be people smaller than, and a lot of people bigger than, someone else.

The key to a healthy diet is moderation. Health professionals do not recommend extreme dieting and starvation as a healthy way to lose weight.

A healthy diet is low in fat and consists of food from the five food groups in the food guide pyramid.

People trying to lose weight should do so moderately over time, making permanent lifestyle changes. They should not drop below 1,200 calories a day.

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