



Astronomy Club News

November, 2003

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Catskills Astronomy Club News

11/1/03

Club News:

Televue/Vixen Day was held at Highpoint Scientific in Montague, NJ on October 11th. Mark Rosengarten submitted the following summary of the event.

I arrived at Highpoint at 10:00 AM, just as the festivities got started. It was a very windy day, and the food was set up outside. We spent a lot of the day chasing down napkins, cups and container tops that blew off the serving tables and out across the front lawn.

Most of my day was spent outside, where I had set up my little Tak 60 H-alpha setup. Another guy had a TV-102 with a 60-mm Coronado filter and a binoviewer set up, and Evan Miller had a Ranger with a SolarMax 40 and a binoviewer. Despite the calmness of the sun, it was a beautiful day for solar observing.

Al Nagler and his wife were there, showcasing their new products. Included in the lineup are some new filters, a bracket to attach a Starbeam finder to an SCT and the new TV-60 apo refractor. This last was placed side by side with a 3.5" Questar at similar magnifications and lined up with the Televue bird to compare details. The Questar had the sharpness edge, but not by much. This new little scope looks like the front end of one side of 60-mm binos with a Ranger helical focuser on the end. The carry case it comes with is adorable. Can you say "birding scope"? Can you say "Ultraportable solar scope"? It is indeed a beautiful and adorable scope. It comes with a shorter version of the Ranger sliding dovetail mount.

The joint was jumping with buyers and many things were sold that day. The new Vixen line of binoculars were out, and they had nice brightness, decent FOV and fair edge correction. A new Vixen EQ goto mount was also on display, with translucent blue covers on the axes and a handheld tablet computer control with built-in planetarium and control software. The computer was fairly big and had a very reflective protective covering, but at night it shouldn't make a difference. The control could also be hooked up to a computer network through its Ethernet port. A pair of very large Vixen binoculars (more a binoscope with dual objectives, 80 or 90 mm diameter) was set up, and the views through it at the nearby woods was very nice.

I left around 3:00 after stuffing myself on the catered mega-hero that was there. They had two kinds of subs, and they had ordered three of each, but by the time I left they were still working on the original ones. Lots of nice conversation and of course, Barlow Bob was there. He had lent his "Bob-o-scope" H-alpha wonderscope to a friend for the winter months, but he showed up in all his Bobness.

All in all, I found it to be a very enjoyable day, and i look forward to the next one.

Mark

The observation session on October 25th was held on October 24th due to a poor weather forecast for the scheduled date. Three people participated. The evening started with viewing Mars and Uranus. Mars showed a distinct gibbous phase. The polar cap and dark surface markings were still visible. Uranus was seen as a tiny blue disk. A number of globular clusters were viewed. These included M55, M75, and M30. They are not often seen since they are relatively low in the southern sky. We also viewed the planetary nebulae M76 (the Little Dumbell), NGC 7662 (the Blue Snowball), and NGC

7009 (the Saturn Nebula). The galaxies M31, M32, M110, M33, NGC 7331, and NGC 1023 were viewed as well. We thought there might have been a faint aurora on the northeast horizon between 8:00 and 9:00.

The October 18th observation session was cancelled due to cloudy skies.

The November club observation sessions are on the 1st and 29th.

Anyone interested in submitting an astronomical observation or photograph for the newsletter, please contact John at kocis@verizon.net.

Each month the photo section of our newsletter will highlight the telescopes and equipment of club members. If you have a photo of your scope or equipment and a brief description of it that you would like to contribute please send it to John at kocis@verizon.net.

The club has selection of astronomy books, a Macintosh computer with astronomy software, and a Meade eight inch reflector for members to borrow. Please contact John at 791-5240 or kocis@verizon.net if you are interested in borrowing any of these.

Astronomy News:

Here are some articles from various NASA sources that might be of interest.

<http://www.news.cornell.edu/releases/Oct03/Arecibo.asteroid.deb.html>

Asteroid Hermes, lost for 66 years, is found to be two objects orbiting each other, astronomers using Arecibo telescope report

FOR RELEASE: Oct. 23, 2003

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ARECIBO, P.R. — An asteroid that has eluded astronomers for decades turns out to be an unusual pair of objects traveling together in space, a planetary scientist using the National Science Foundation's (NSF) Arecibo Observatory radio telescope and his colleagues report.

The asteroid Hermes was re-discovered last week after being lost for 66 years. Now Jean-Luc Margot, a researcher in the Department of Earth and Space Sciences at the University of California, Los Angeles, has determined that the asteroid is in fact two objects orbiting each other. The two objects together would cover an area approximately the size of Disneyland.

Margot and colleagues are analyzing new radar measurements from the Arecibo Observatory, Puerto Rico, the world's largest single-dish radio telescope, operated by the National Astronomy and Ionosphere Center (NAIC) at Cornell University, Ithaca, N.Y., for the NSF. The astronomers are scheduled to obtain additional measurements using the Arecibo telescope this weekend (Oct. 25-26).

Hermes makes frequent close approaches to Earth, Venus, Mars, as well as Vesta, the third largest asteroid in the main asteroid belt between Mars and Jupiter. While several other asteroids have satellites, the other known binaries with trajectories that cross the orbit of the Earth consist of a large primary asteroid orbited by a much smaller one.

"Hermes is the first asteroid ever discovered in the near-Earth population where the two components are essentially equal in size," Margot said. "It's a very unusual binary, a puzzle. It may have formed when it swung so close to a planet that it was ripped apart by gravitational forces, but we don't know for sure. One of our goals is to learn more about the two components and how they rotate about each other in the hopes that we may be able to deduce how Hermes became a double asteroid.

"Because the components are close to each other, they raise appreciable tides in each other and each has slowed down the other's spin significantly. They are now likely in a doubly synchronous state, where their spin period is equal to their orbital period. This means they constantly present the same face to each other, just like Pluto and its satellite, Charon."

Hermes, was first observed in 1937 as a fast-moving bright object and then went undetected until last week, although it had circled the sun almost exactly 31 times since then, said Brian Marsden, of the Minor Planet Center in Cambridge, Mass.

On Oct. 15, Brian Skiff of the Lowell Observatory Near-Earth-Object Search sighted a mysterious object; Timothy Spahr at the Minor Planet Center in Cambridge identified similarities with the 1937 observations, and Steven Chesley and Paul Chodas at NASA's Jet Propulsion Laboratory (JPL) linked the observations to Hermes.

The same day, Margot and his team proposed to observe the asteroid with the Arecibo Observatory's high-powered radar system — a proposal that was accepted within hours.

The goals of the proposal were to measure precisely the distance and velocity of this object, to improve the knowledge of its trajectory and help trace back its history, to characterize Hermes' physical properties, and to search for satellites.

Margot and collaborators have been given five sessions at Arecibo and five sessions at the Goldstone radar telescope in California to observe Hermes. Due to the urgent nature of the proposal, Margot observed from his home computer while his associates, Mike Nolan, Victor Negron, Alice Hine, and Don Campbell, associate director of NAIC, were at the Arecibo telescope.

Hermes gets as close as 378 000 miles from Earth — which, in astronomical terms, is quite close, about 1.6 times the distance between Earth and the moon. Orbits can change appreciably over time due to gravitational influences of the planets, noted Nolan, an Arecibo Observatory scientist.

Hermes travels on an elliptical orbit and reaches deep into the inner solar system, crossing Venus' orbit. The new research has made it possible to extend the time interval over which the trajectory can be computed reliably, said Jon Giorgini, a senior engineer at JPL and member of the team.

"As far as impact risk, there is no cause for worry in our lifetimes," Giorgini said. "Over hundreds of thousands or millions of years, Hermes could impact the Earth, but only if it doesn't hit Venus first."

Margot and colleagues described their observations and data in an International Astronomical Union Circular this week. Margot's research is funded by NASA. His co-authors are Nolan, Negron, Hine, Campbell, and Ellen Howell at NAIC; Lance Benner, Steven Ostro, and Giorgini at JPL; and Marsden at the Minor Planet Center.

Spotlight Feature October 20, 2003

Spotlight: Missing Link Sought in Planetary Evolution

Just as anthropologists sought “the missing link” between apes and humans, astronomers are embarking on a quest for a missing link in planetary evolution. Only instead of dusty fields and worn shovels, their laboratory is the universe, and their tool of choice is NASA’s new Space Infrared Telescope Facility.

Launched on Aug.25, NASA’s fourth and final Great Observatory will soon set its high-tech infrared eyes on, among other celestial objects, the dusty discs surrounding stars where planets are born.

While other ground- and space-based telescopes have spied these swirling “circumstellar” discs, both young and old, they have missed middle-aged discs for various reasons. The Space Infrared Telescope Facility’s unprecedented sensitivity and resolution will allow it to fill in this gap and in the process answer fundamental questions regarding how planets, including those resembling Earth, may form.

“With the Space Infrared Telescope Facility, we anticipate seeing many planetary discs at all stages of development,” says Dr. Karl Stapelfeldt of JPL, a scientist with the mission. “By studying how they change over time, we may be able to determine what conditions favor planet formation.”

Circumstellar discs are a natural step in the evolution of stars. Stars begin life as dense cocoons of gas and dust, then as pressure and gravity kick in, they begin to coalesce, and a flat ring of gas and dust takes shape around them. As stars continue to age, they suck material from this disc into their core. Eventually, a state of equilibrium is reached, leaving a more mature star encircled by a stable disc of debris.

It is around this time, about 10 million years into the lifetime of the star, that astronomers believe planets arise. Dust particles in the discs are thought to collide to form larger bodies, which ultimately sweep out gaps in the discs, much like those lying between the rings of Saturn.

“You can think of planets as wrecking balls that either clear away debris or gather it up as if it were mud,” says Dr. George Rieke, principal investigator on one of the three science instruments onboard the observatory.

Infrared telescopes can sense the glow of the cosmic dust that makes up these discs; however, they cannot detect planets directly. Planets have less surface area than their equivalent in dust grains and thus give off less infrared light. This is the same reason coffee is ground up before brewing: the larger combined surface area of the coffee grains results in a more robust pot of coffee.

Past observations of circumstellar discs generally fall into two categories: young, opaque discs (called protoplanetary discs) with more than enough mass to match our own solar system’s planetary bodies; or older, transparent discs (called debris discs) with masses equal to a few moons, and doughnut-like holes at their center. Middle-aged discs linking these two developmental stages have gone undetected.

One of the questions astronomers hope to address with the Space Infrared Telescope Facility is: What happened to all the mass observed in the younger discs? Somewhere in their evolution, mass is either eaten up by the star, ejected by the star or transformed into planets that lie in the doughnut holes of the discs. By analyzing the composition and structure of the “missing link” discs, astronomers hope to solve this riddle, and better understand how planetary systems like our own evolved.

- Closest asteroid yet flies past Earth
> Jeff Hecht

- > New Scientist
- > October 2, 2003
- >
- > An asteroid about the size of a small house passed just 88,000 kilometres from the Earth by on Saturday 27 September - the closest approach of a natural object ever recorded. Geostationary communication satellites circle the Earth 42,000km from the planet's centre. The asteroid, designated 2003 SQ222, came from inside the Earth's orbit and so was only spotted after it had whizzed by. The first sighting was on Sunday 28 by the Lowell Observatory Near-Earth Object Search program in Arizona, US. The asteroid's 1.85-year orbit is quite eccentric, indicating it cannot be a man-made object, Marsden says. He estimates the asteroid measured less than 10 metres. This is too small to have posed a danger to Earth, although it would have made a spectacular
- >
- > Full story here:
- >
- > • <http://www.newscientist.com/news/news.jsp?id=ns99994228>

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Jet Propulsion Laboratory, Pasadena, Calif.

Donald Savage (202) 358-1547
NASA Headquarters, Washington, D.C.

NEWS RELEASE: 2003-140 October 23, 2003

NASA Scientist Dives into Perfect Space Storm

Newly uncovered scientific data of recorded history's most massive space storm is helping a NASA scientist investigate its intensity and the probability that what occurred on Earth and in the heavens almost a century-and-a-half ago could happen again.

In scientific circles where solar flares, magnetic storms and other unique solar events are discussed, the occurrences of September 1-2, 1859, are the star stuff of legend. Even 144 years ago, many of Earth's inhabitants realized something momentous had just occurred. Within hours, telegraph wires in both the United States and Europe spontaneously shorted out, causing numerous fires, while the Northern Lights, solar-induced phenomena more closely associated with regions near Earth's North Pole, were documented as far south as Rome, Havana and Hawaii, with similar effects at the South Pole.

"Remarkably, science has documented solar events a hundred times more intense," said Dr. Bruce Tsurutani, a plasma physicist at NASA's Jet Propulsion Laboratory in Pasadena, Calif. "But none of them interacted with the Earth in such a violent manner. What happened in 1859 was a combination of several events that occurred on the Sun at the same time. If they took place separately they would be somewhat notable events. But together they create the most potent disruption of Earth's ionosphere in recorded history. What they generated was the perfect space storm."

To begin to understand the perfect space storm you must first begin to understand the gargantuan numbers with which plasma physicists like Tsurutani work every day. At over 1.4 million kilometers (869,919 miles) wide, the Sun contains 99.86 percent of the mass of the entire solar system: well over a million Earths could fit inside its bulk. The total energy radiated by the Sun averages 383 billion trillion kilowatts, the equivalent of the energy generated by 100 billion tons of TNT exploding each and every second.

But the energy released by the Sun is not always constant. Close inspection of the Sun's surface reveals a turbulent tangle of magnetic fields and boiling arc-shaped clouds of hot plasma dappled by dark, roving sunspots.

Every once in a while — exactly when scientists cannot predict - - an event occurs on the surface of the Sun that releases a tremendous amount of energy in the form of a solar flare or a coronal mass ejection, an explosive burst of very hot, electrified gases with a mass that can surpass that of Mount Everest.

What transpired during the dog days of summer 1859, across the 150 million-kilometer (about 93 million-mile) chasm of interplanetary space that separates the Sun and Earth, was this: on August 28, solar observers noted the development of numerous sunspots on the Sun's surface. Sunspots are localized regions of extremely intense magnetic fields. These magnetic fields intertwine, and the resulting magnetic energy can generate a sudden, violent release of energy called a solar flare. From August 28 to September 2, several solar flares were observed. Then, on September 1, the Sun released a mammoth solar flare. For almost an entire minute the amount of sunlight the Sun produced at the region of the flare actually doubled.

“With the flare came this explosive release of a massive cloud of magnetically charged plasma called a coronal mass ejection,” said Tsurutani. “These things actually fire out from the Sun radially, so not all of them head toward the Earth. But those that do usually take three to four days to reach Earth. This one took all of 17 hours and 40 minutes.”

Not only was this coronal mass ejection an extremely fast mover, the magnetic fields contained within its charged particles were extremely intense and in direct opposition with Earth's magnetic fields. That meant the coronal mass ejection of September 1, 1859, overwhelmed Earth's own magnetic field, allowing charged particles to penetrate into Earth's upper atmosphere. The endgame to such a stellar event is one heck of a light show and more — including potential disruptions of electrical grids and communications systems.

Back in 1859, the invention of the telegraph was only 15 years old and society's electrical framework was truly in its infancy. A 1994 solar storm caused major malfunctions to two communications satellites, disrupting newspaper, network television and nationwide radio service throughout Canada. Other storms have affected systems ranging from cell phone service and TV signals to GPS systems and electrical power grids. In March 1989, a solar storm much less intense than the perfect space storm of 1859 caused the Hydro-Quebec (Canada) power grid to go down for over nine hours, and the resulting damages and loss in revenue were estimated to be in the hundreds of millions of dollars.

“The question I get asked most often is, ‘Could a perfect space storm happen again, and when?’” added Tsurutani. “I tell people it could, and it could very well be even more intense than what transpired in 1859. As for when, we simply do not know.”

To research this perfect space storm, Tsurutani and co-writers Drs. Walter Gonzalez, of the Brazilian National Space Institute, and Gurbax Lakhina and Sobhana Alex, of the India Institute of Geomagnetism, used previously reported ground, solar and auroral observations, and recently re-discovered ground-based magnetic-field data from Colaba Observatory in India. The findings were published in a recent issue of the Journal of Geophysical Research.

For more information on the Internet, visit <http://sse.jpl.nasa.gov/planets/> and <http://www.nasa.gov>

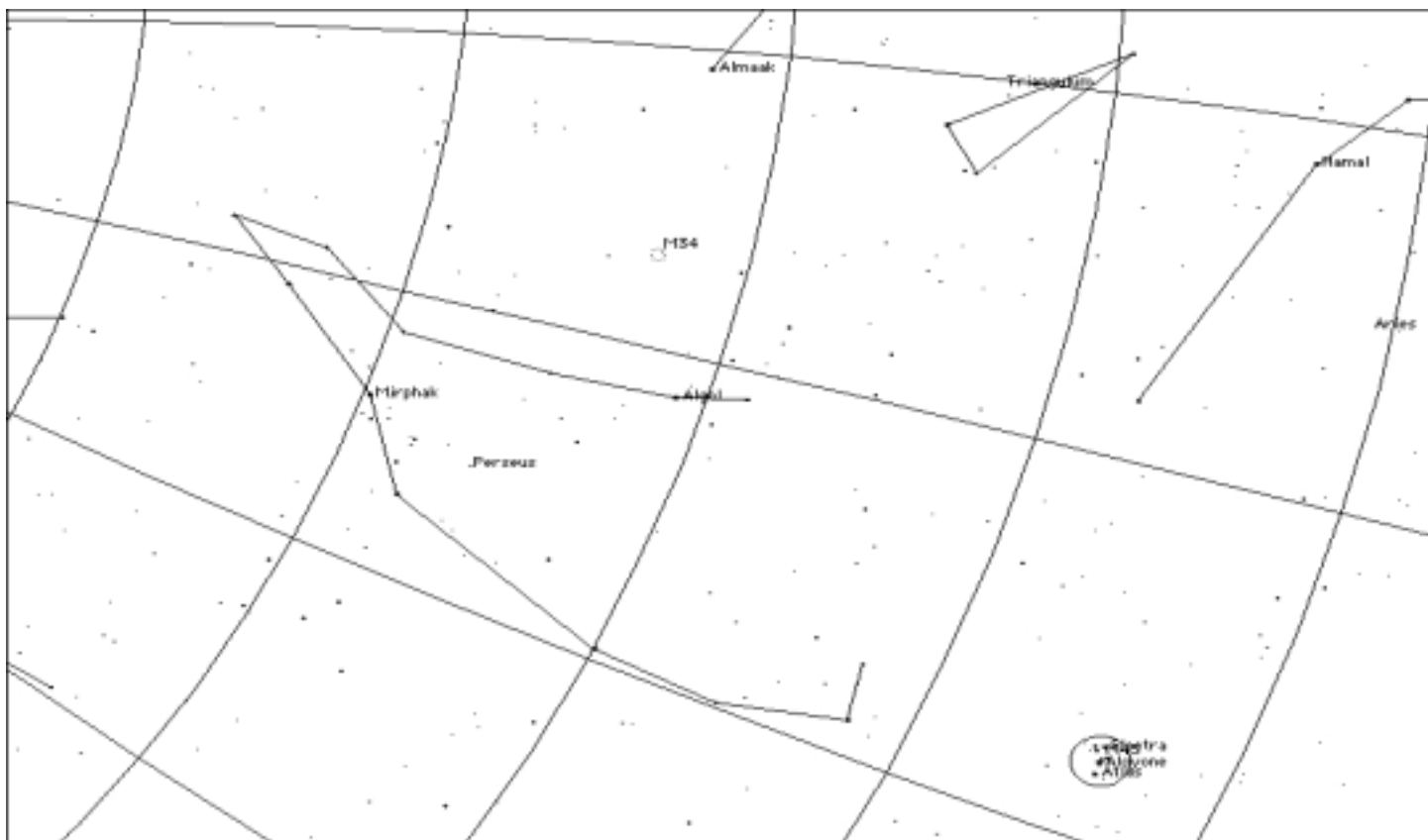
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Mid Evening Observing Highlights for November

Mars is still dominant in the southerne sky. The Keystone of Hercules is setting in the west. The Summer Triangle (Vega, Altair, and Deneb) is in the western sky. The Great Square of Pegasus is directly overhead with M31 (the Andromeda Galaxy) almost overhead. Perseus is high in the northeastern sky. Taurus and Auriga are rising in the east. Later in the month Orion will be rising in the east. The Big Dipper is low on the northern horizon. The Pleiades (M45) is also rising in the east. The picture below shows the constellation Perseus and the location of the open star cluster M34 as well as M45.

Full moon is on November 9th and new moon is on November 23rd. The Leonid meteor shower peaks on November 18th.

A total lunar eclipse will be visible on November 9th starting at 8:06 pm and ending at 8:31 pm. The partial phase begins at 6:32 pm and ends at 10:04 pm.



Observations and Photographs

This is a new section of our newsletter for members to submit their own observations and photographs. If you are interested in submitting an observation or photograph please contact John at kocis@verizon.net.

The image below was taken by John Kocijanski on 10/24/03 and it shows Sunspots 484 and 486. They are both about the size of Jupiter. An Olympus D-550 digital camera was used with a 20mm Meade Super Plossl eyepiece on a Stellarvue AT1010.



BARLOW BOB'S CORNER

Barlow Bob is a member of the Rockland Astronomy Club.

North Eastern Indians Stories

Again the animals complained that they did not know where they were when there was no moon out. So the Great Spirit said he would solve the problem. "Do you see that big pile of shinny rocks? You can place them in the sky and draw some pictures so you will know where you are.." I will make them glow at night. " Well who will do this?" The animals asked. The Great Spirit picked the wolf to place the rocks in the sky. But the wolf didn't know how he was going to get up in the sky. The Great Spirit said. "Do you see this rock, well it is special, if you carry this in your mouth you can fly up to the sky and place the rocks there."

Wolf took the special rock in his mouth and gathered several shinny rocks went up to the sky and drew a picture of the bear. He then made several trips back and forth placing the rocks in shapes of his friends. When all the rocks were gone, he put down the special rock and went to gather all his friends to see the pictures glow in the sky. When they looked up, wolf realized he did not draw a picture of him self, and he started to howl. He thought about it and went back to get the special rock. He wanted to fly up again and rearrange some of the rock, so he could have a picture of himself. But he could not find the rock. So he still howls at the sky.

The Indians say that when the farmers heard this story, they wanted to find the rock so they could fly. They looked and looked on there land. But never did find it. That is why we have so many rock walls in the northeast. They just piled them up looking for that special rock that would allow them to fly. Maybe that rock is in your yard. Someday if you pick up a rock and start to fly you will know you found it. .

NASA Space Place

Hurricane Team Work

by Dr. Tony Phillips

On a gray breezy day last month thousands of people got in their cars and reluctantly left home. U.S. east coast highways were thick with traffic. Schools were closed. Businesses shut down.

Perfect!

When powerful Hurricane Isabel arrived some 38 hours later nearly everyone in the storm's path had fled to safety.

Days later Vice Admiral Lautenbacher, in a briefing to President Bush, praised the National Atmospheric and Oceanic Administration (NOAA): "Without NOAA's excellent track forecasts, hurricane Isabel's toll on lives and property would have been even more devastating. This is NOAA's first year of providing 5-day forecasts-and the 5-day forecast for Isabel was as good as our 2-day forecasts have been over the last decade."

Many people in NOAA played a role. A team of pilots, for instance, flew Gulfstream-IV High Altitude Surveillance jets right up to the approaching hurricane, logging 25,000 miles in the days before land-fall. Their jets deployed devices called dropsondes-little weather stations that fall toward the sea, measuring pressure, humidity, temperature and wind velocity as they plummet. The data were radioed back to the aircraft and transmitted to forecasters on shore.

While two Gulfstream-IV crews flew night and day around the storm, a NOAA satellite named GOES-EAST monitored Isabel from above. (GOES is short for Geostationary Operational Environmental Satellite.)

From an orbit 22,300 miles above the Atlantic Ocean, GOES-EAST had a unique view. "It could see the entire hurricane at once," says Ron Gird of NOAA. "Scientists used infrared spectrometers onboard the satellite to estimate the height of the storm clouds, their temperature and water content. GOES can also measure the temperature of the ocean surface-the source of power for hurricanes."

Constant streams of data from GOES and the Gulfstream aircraft were fed to supercomputers at NOAA's Environmental Modeling Center in Maryland where sophisticated programs, developed over the years by meteorologists and programmers, calculated the storm's most likely path.

Supercomputers. Satellites. Jet airplanes. Scientists. Programmers. Pilots. It took a big team using a lot of tools to predict where Isabel would go-accurately and with time to spare.

Says Vice Admiral Lautenbacher: "I hope everyone at NOAA shares the pride of being part of a team effort that so effectively warned the public of impending danger and enabled citizens to take action to

protect themselves and their loved ones.”

Well done, indeed.

To learn more about the GOES, see www.oso.noaa.gov/goes/ . For kids, the SciJinks Weather Laboratory at scijinks.nasa.gov has lots of fun activities and fascinating facts about the wild world of weather.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

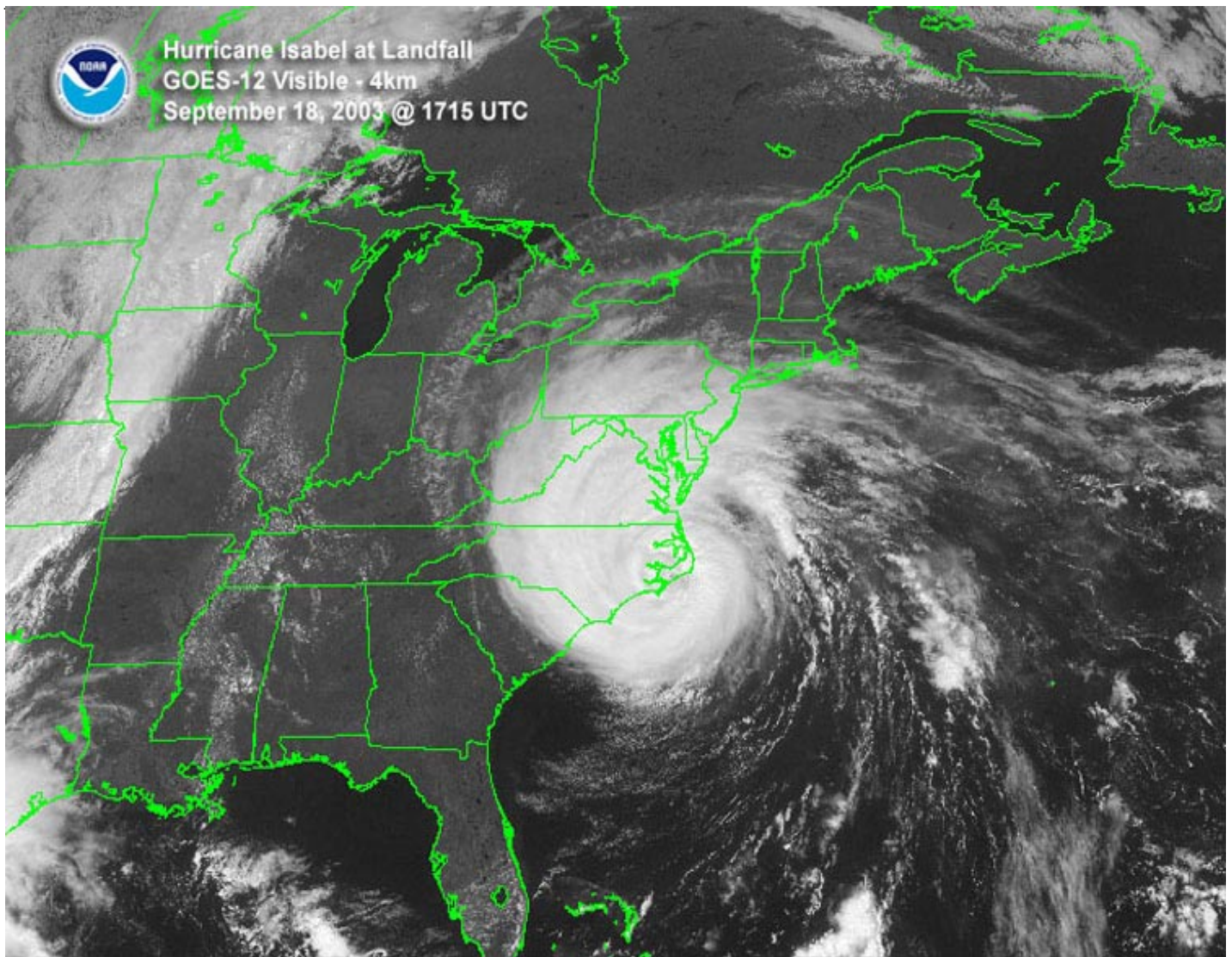


Image Caption:

GOES-East satellite image of hurricane Isabel as it makes landfall on September 18, 2003 at 1715 UTC.

The dues are due

Please snip off the voucher and return it as soon as possible. Thank you,
Bud Wertheim, Treasurer

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