

# ANNOUNCEMENTS!



## **NEW LIFETIME MEMBER DUES RATE:**

The Board has now approved the rates for subscribing as a lifetime member of the IAAA. New rates are:

Associate member – \$350 or 235 GBP

Artist member – \$400 or 265 GBP

Fellow member – \$450 or 300 GBP

(must be elected first)

## **Web Surfin' Sites to check out :**

- <http://www.geophot.com>
- <http://www.sfrevu.com/>
- <http://www.3dcafe.com/asp/meshes.asp>
- <http://www.2111.org/artcoll.htm>
- <http://www.spacechannel.org>
- <http://mpfwww.jpl.nasa.gov/mgs/index.html>
- <http://pluto.njcc.com/~paulsam/bruce/index.html>
- <http://pluto.njcc.com/~paulsam/traditional.html>
- <http://www.finley-holiday.com/Human/human.html>
- [http://www.boulder.swri.edu/recent/pluto\\_map.pdf](http://www.boulder.swri.edu/recent/pluto_map.pdf)
- <http://www.boulder.swri.edu/~durda/seq2.mpg>
- <http://www.boulder.swri.edu/~durda/pl20x10va.mpg>
- [http://www.discover.com/jan\\_01/featmachines.html](http://www.discover.com/jan_01/featmachines.html)

## **Book of the Month:**

Stuhlinger, Ernst and Frederick I. Ordway III Wernher von Braun: "Crusader for Space - An Illustrated Memoir" Krieger Publishing, Malabar, FL 1994. hardcover ISBN:0-89464-824-1

This post is to inform the general membership that the Fellows of the IAAA recently held an election to find their first Director of the Fellows. Ladies and Gentlemen, Members of the IAAA, on behalf of all of the Fellows, the Board would like to extend its heart felt congratulations to our new Director of the Fellows: **DON DAVIS**.

Sincerely, Kara Szathmáry, IAAA President and Chairman of the Board

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Annual rates by member type, \$40, \$45, or \$50, non-US members pay in pounds sterling to DAH below

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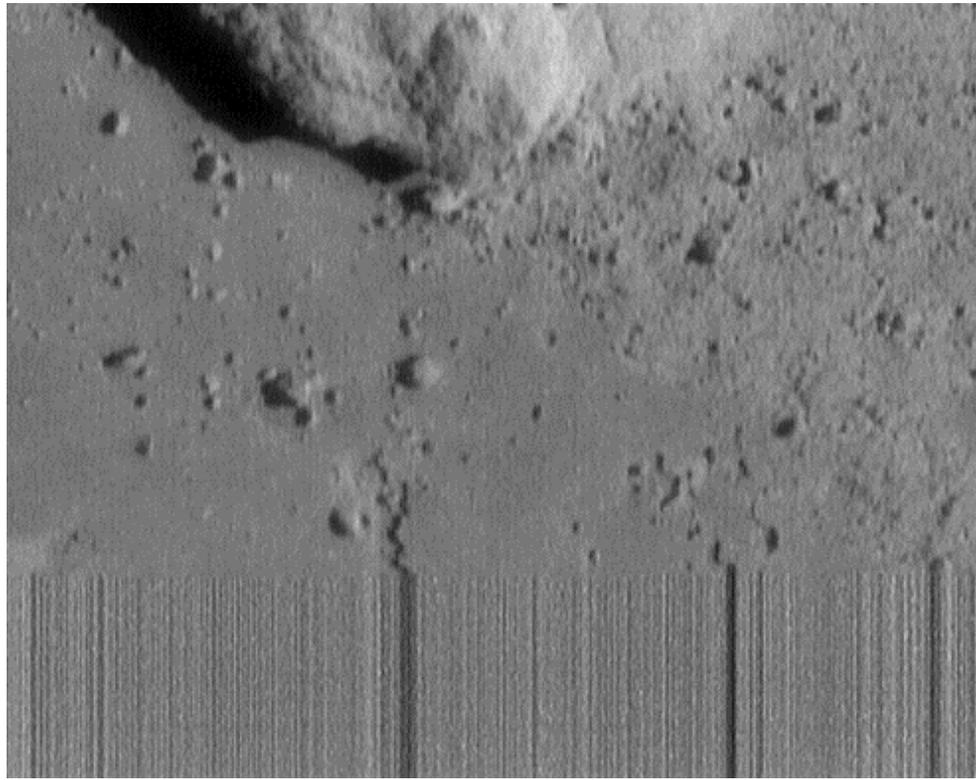
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**Feb / Mar 01**

The Official Newsletter of the  
  
International Association of  
**Astronomical Artists**

## **Things that go BUMP in the night!**



Near Shoemaker took this picture of the surface of the asteroid Eros at an altitude of only 394 feet above the surface. Vertical lines show when Shoemaker impacted the surface and lost contact with Earth – or did it? Details inside! NASA photo.

**Editor: Jon Ramer**

**IAAA Website: <http://www.iaaa.org>**

## IN THIS PULSAR...

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### From the Editor-

Hi Gang! Wow - can you believe it!? LANDING on an asteroid!?! We need to send a human crew to do that now... Enjoy the facts & figures on this incredible event, next issue we're off to Mars. Oh yeah - there's WORKSHOP news too!

*Jon!*

*Probably the neatest thing about an irregular asteroid is the fact that gravity field changes dramatically. What looks like "down" in one area is really flat while what looks like "up" in another is actually down! Check out the boulders "hanging" off the south end of Eros...*



## Astronomical 'Feature' of the Month :

-- EROS 433 --

Eros 433 is one of the largest and best-observed near-Earth asteroids. Discovered independently by Gustav Witt (Germany) and August H.P. Charlois (France) in 1898, Eros accounts for nearly half the volume of all near-Earth asteroids. The potato-shaped space rock's dimensions of 21 miles (33 kilometers) long, 8 miles (13 kilometers) wide and 8 miles thick make it about twice the size of Manhattan.

Eros orbits the Sun with a perihelion of 1.13 Astronomical Units (169,045,593 kilometers) and an aphelion of 1.78 AU (266,284,209 kilometers), and it rotates once every 5 hours and 16 minutes and takes 1.76 Earth years to orbit the Sun.

The gravity on Eros is very weak but enough to hold the NEAR Shoemaker spacecraft. Depending on where they stood, a 200-pound person on Earth would weigh about 2 ounces on Eros. A rock thrown from the asteroid's surface at 22 miles an hour (10 meters per second) would escape into space. The estimated "daytime" temperature is about 212° F (100° C), while at "night" it plunges to -238° F (-150° C).

Eros is an S-type asteroid, the most common type found in the inner asteroid belt. Asteroids are classified by their albedos and colors as determined by spectrographic observation. The spectra of S-types imply a composition of iron- and magnesium-bearing silicates (pyroxene and olivine) mixed with metallic nickel and iron. Scientists try to match an asteroid's spectra with the mineralogy of meteorites found on Earth. Ordinary chondrites, the most common meteorites, seem primitive and relatively unchanged since the solar system formed 4.6 billion years ago. Stony-iron meteorites, on the other hand, appear to be remnants of larger bodies that were once melted so that the heavier metals and lighter rocks separated into different layers. Eros is spectrally similar to both ordinary chondrite and stony iron meteorites, but its composition more closely matches the ordinary chondrites.

*A mosaic of images of the southern region, the conspicuous depression just above the center of the frame is the saddle-shaped feature Himeros. Arrow shows the probe's landing spot.*



You only need two things to draw the cast shadow of anything: the direction of the shadow and the length of the shadow.

Let's take the simplest possible example: you need to draw the shadow of a flagpole. You have a horizon line and somewhere between that and the bottom of the picture is a vertical line representing the pole. If the sun is anywhere at all in the frame, all you need to do is to find the point on the horizon directly below it. From that point draw a line to the bottom of the flagpole. Continuing the line to the bottom of the picture gives you the direction of the shadow. Now draw a line from the sun itself, through the top of the flagpole and on to meet the direction line. Where the two lines meet gives you the length of the shadow. To do a vertical wall, like a billboard, all you need to consider are the two vertical lines at either end. To construct the shadow of a cube, all you need to do is cast the shadows of the four vertical lines that make up the corners. In a like manner you can find the shadow of any object, whatever its shape may be--even curves: ignore the shape itself and only consider the top and bottom points of vertical lines. (Shadows cast by a sun that is out of the frame behind you requires an extra step that we won't get into here.) Just to get the principle across of how the shadow of Saturn's rings are cast onto the planet I reduce the system to the same basics as the above example.

1. Draw a top view of Saturn and, directly below it, a side view (with a horizontal line representing the ring). To save space, you only need to draw a semicircle for the top view (since the other half of the circle would be a mirror image of what you're doing - no need to be repeat your work!). You also only need to draw a segment of the ring as wide as the planet itself, since that is the only part of the ring that is casting a shadow on the planet.

2. Mark a point at random on the outside edge of the ring, say about halfway along the curve. Draw a horizontal line from that point to meet the circle that you've drawn for Saturn. What you have is the direction of the shadow of the point.

3. Now drop a vertical line from that point until it meets the equator on the side view. From that point, draw a curve (like a longitude line) to the south pole. I'm sure most of us can freehand this reasonably well enough.

4. Now drop a line from the point you marked on the outer edge of the top view of the ring until it meets the side view of the ring.

5. Decide how high above the ring the sun is (that is, the angle the sun makes with the ring plane). Draw a line at that angle through the point you found on the side view of the ring. Continue this line until it meets the longitude line you drew in #3. This is the place on Saturn where the shadow of that point falls. If you do this for several points on the outer edge of the ring, you will wind up with a series of corresponding points on Saturn. Connecting these will result in a curve that represents the shadow of the outer edge of Saturn's ring.

If you repeat this for the outer and inner edges of each ring, you can construct the shadow of the entire ring system. It's probably only necessary to do the main rings, since once you have those curves it's not too difficult to use them as a guide for freehanding the remaining details, such as Cassini's

# WORKSHOP 2001!

 From Jackie Burns

Hello everyone, I hope that you have all had a wonderful time over the Christmas and New Year festivities and are now looking forward to the new millennium and all that it holds for us. To kick off the New Year the Board is delighted to announce the Astrium Workshop 2001!

The main core of the workshop will be held at Astrium UK, in Stevenage, on 3 - 6 September. Added to this will be a lecture and time spent with Dr. Monica Grady (Head of the UK National Collection of Meteors, and author of "Search for Life"). And, finally (dates to be confirmed), sunrise and sunset sketching and photographic sessions 'within' the boundaries of Stonehenge.

**ASTRIUM (3 - 6 September):** Astrium UK is a satellite manufacturer based in Stevenage (up until last year, known as Matra Marconi) and have manufactured such satellites as SOHO, ERS-1 and 2, and Envisat. They are offering a series of guided tours around their premises, with access to key personnel, to observe the creative and hardware process of satellite manufacturing. Around these guided tours will be time set aside for sketching and photography, with access to a quiet and secure area where we can also paint. This will be a 'nuts and bolts' type of workshop, aimed at

stimulating anyone who is interested in painting space hardware. Dave Hardy and myself have already been on a preliminary tour. What we were shown as we were guided around the various departments and laboratories quite simply blew me away. I had no idea what it took to create a satellite and it has changed the way that I visualize my own renditions of space hardware. But, above all, it was hugely enjoyable and I can't recommend this experience highly enough.

**(cont'd on page 4)**

ST-1, a communications satellite for Singapore and Taiwan Telecoms nearing assembly completion at Astrium UK, one of the many sites Astrium Workshop attendees will get to see.



A further unique feature is the invitation to show completed artwork resulting from this workshop at the Boxfield Gallery, Stevenage Leisure Centre in July 2002. Astrium UK have booked this very popular gallery, just for the attending members of the workshop, so that we can show off the results inspired by what we will have seen and experienced. An amazing opportunity! On another point, Astrium is very, very security conscious. Full details of Astrium's security requirements will be sent separately to those members who sign up. However one security measure that everyone needs to know about: only members will be allowed to attend this part of the workshop. Other arrangements for spouses/partners will have to be made. There is a direct train line from Stevenage to London (shopping, sightseeing, etc.) or, I believe, there is also a very good shopping mall in Stevenage itself. If anyone has any other ideas, I am happy to listen.

**DR. MONICA GRADY:** Monica is based at the Natural History Museum in London. She is a lovely lady and a much sought after speaker and is very keen to meet us as she really does appreciate the value of our work. Monica has agreed to participate with us at Astrium on 4 September. She will join us for part of the tour in the morning and then will be giving us a slide show and talk in the afternoon.

**STONEHENGE:** From the modern to the ancient.... English Heritage (a charitable trust that manages Stonehenge) have made available limited private access to this world renowned monument. From dawn until half an hour before the site opens or half an hour after the site has closed until sunset or dusk (whichever is earliest). The point of these private sessions is the freedom to move in and around the stones (the stones are fenced off from the public). I propose two sessions: one from dawn, and the second until sunset.

Conditions are fairly strict and will be communicated separately to those members who sign up for the workshop. An application for permission to English Heritage has to be made in advance and must include definitive numbers.

### *Planetesimal* By William K. Hartmann, FIAA

Here Bill shows a planetesimal of the early solar system. The Sun is reddened by the abundant dust. A small meteor has impacted to the left.



## Kudos Korner

- Kudos to Don Davis for many of his famous impact paintings used in the new book "Target Earth" which is available at Barnes and Noble
- Michael Carroll for his rover painting (detail) used in the job opportunity section of Haas Automation's CNC machine tools web site. This is the same one used by NASA and Mattel Toys
- A pat on the back to UK artist Richard Bizley who has three nice pieces in the February Astronomy Now. Mark Garlick also has an article on HST in the same issue
- Look for Mark's article in the March Sky & Telescope on starspots, featuring his award-winning flare-star picture on a two-page spread, and another picture of a young spotty star
- Mark Garlick's on a roll – he's got a piece on the cover of March's ASTRONOMY NOW
- Let's not forget other UK members, Andrew C Stewart, has a nice, photographic-looking digital piece on the cover and inside the current (February) ASTRONOMY
- Don Davis and Don Dixon have works inside the latest PLANETARY REPORT, and Edwin Faughn on its back cover
- UK members and any others who can pick up BBC2 may be interested to know that their March broadcasts feature an interview made at Dave Hardy's studio, with a brief shot of Dave standing on his 'Proxima's Planet'!
- Speaking of Dave - his Orion Nebula painting is also in the January "Popular Astronomy" - pretty, but not green!
- Aldo Spadoni managed to get on the cover of the 16 Feb "Aviation Week & Space Technology" magazine, though the subject matter has nothing to do with Astronomy or space
- March's "Astronomy" magazine is resplendent with artwork from Lyn Cook showing off extra-solar planets
- The Dec 2000 issue of Space Illustrator has some great images of Europa by Michael Carroll and one of Robert McCall's 2001 paintings
- Hilda Demsky had an exhibition of work based on her Yellowstone experience on show at the Lyman-Eyer Gallery, West Newson, Mass., from 6th-18th March, called "Existence Sprang Forth"
- Kudos to Michael Carroll for his solar sail painting in the March 5 issue of Time magazine almost 1/2 page on page 58. Nicely done piece shows powerful earthbound laser propelling the solar sail to interstellar space. The painting is for the article entitled "Setting Sail in the Cosmos" which also talks about the upcoming launch of the solar sail experiment this April. this is a joint venture between the Planetary Society and the Russians. It will be launched from a modified Russian ICBM from a submarine in the Barents Sea.
- Kudos also to Don Davis for his asteroid impact painting in the same issue of Time magazine on page 59! This short article is about the Permian extinction event and the buckyballs (buckminsterfullerenes) that were discovered in the Permian layer around the world.

# AN ARTISTIC OPPORTUNITY

Astronomical Art Fair, COSI Museum, Toledo, OH, August 25 & 26, 2001

The COSI Museum in Toledo, Ohio, is organizing a first time event to supplement their new summer exhibit, SPACEtacular. They want to exhibit all kinds of space related art work. This show will not be juried, but all pieces will need to be approved (preview jpeg okay). Art work should be professionally mounted and it is highly suggested that it be protectively enclosed due to the large number of children that visit the science museum. There are no size limits. All of the pieces will be insured while in the display. If the artist wishes to sell their art during the show, he/she will need to pay for the shipment. If the artist is willing to just display his/her pieces, COSI will pay for shipping. Unfortunately, COSI does not have a budget for leasing any artwork. If anyone is interested in participating in this, please contact the IAAA Public Relations Officer, Jon Ramer, at 1112 Magnolia Bayou Blvd, Ocean Springs, MS, 39564, e-mail "ramerj@worldnet.att.net", or telephone (228) 818-5993.

**Profile: Gavin Mundy** I paint because I enjoy it. To me painting is a form of expression, of conveying my thoughts and demonstrating my wonder and respect for.. well, the universe basically.

You may not be wrong in thinking this to be a rather large subject, but there is a wealth of inspiration from its infinite vastness down to its microscopic perfection. The effects of light and shadow, textures and colors are an integral and fascinating part of its portrayal. The only way I know to express this awe is through painting. I appreciate people's respect for the detail in my work, but ultimately it's the subject itself that I want people to consider.

Now science fiction, nature and fantasy may not strike most people as having any particular similarities but I view science fiction and fantasy as a distortion of reality. As such my alien forms often have an organic, evolved feel about them, echoing my interest in nature.

While I may have studied graphic arts, my painting skills are self taught. My use of acrylic paint came about from trial and error, but I found it suited my painting technique best as it allows one to work fast.



## HOW THE HECK DID THEY DO THAT!?!

In honor of the year, I've located a great little source with the secrets of how Stanley Kubrick filmed his masterpiece, "2001: A Space Odyssey." If you've ever wondered how some of those incredible shots were made, each issue this year will detail a little of the magic behind the camera.

### How did the hostess turn upside down without falling into a heap?

Fix the camera to a tubular frame, large enough to contain the entire galley set. Hostess wanders in on her Velcro-encased feet, gets lunch for the guys and ambles away from camera. At the appropriate point, the tubular structure with the camera starts to slowly rotate, while the hostess walks on one spot in her own special Velcro way. Once the open "exit" comes round, all she needed to do was duck into it!

The application must have a choice of three dates/sessions. The first choice will be Friday evening / Saturday morning, 7 & 8 September. Second choice will be Saturday evening / Sunday morning, 1 & 2 September. Third choice will be Sunday evening / Monday morning, 8 - 9 September. There are a number of other ancient monuments around the area of Stonehenge as well as culturally rich towns and cities such as Bath, Winchester and Salisbury. Extra days can be calculated into the workshop itinerary if enough interest is shown from members to visit any of these sites. Fees for any of these other monuments and sites will need to be added.

**LONDON:** As an extra option, trips into London will be considered if there is enough interest from participating members. There is a huge variety of special interest sites, such as the Natural History Museum, the Science Museum, Greenwich Museum and Observatory, etc. Costs for this, such as entrance fees, transport (London public transportation is very good), and accommodation (not cheap) will need to be added on.

**ACCOMMODATIONS:** As with previous workshops, there is a certain amount of flexibility - dependent on personal preferences. Before I start researching I would like to know whether you absolutely have to have a private room, whether you're willing to share a room (for hotels) and whether you are happy to bunk down on the floor (house/cottage rental).

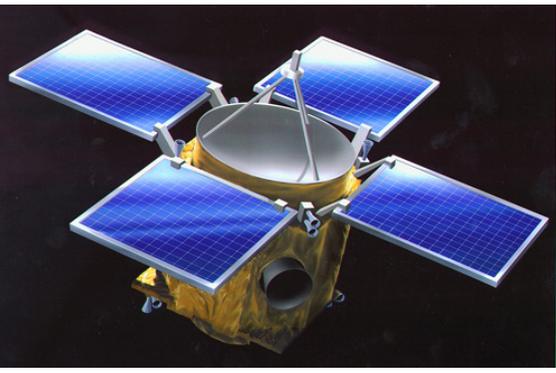
**FINANCES:** Stonehenge - There is a fee of 8 £ (pounds sterling) per adult, per session. Monica Grady - fee to be advised (I expect the workshop members to at least cover her reasonable expenses such as petrol, food etc.) Accommodations - room rates/house-cottage hire to be advised. Stevenage: 4 nights. Stonehenge: at least one night. London: 1-3 nights? All workshop attendees are responsible for their own accommodation bills. Expect to pay a deposit in advance for each stop. Car rental - I would like to think that there will be enough interest from the UK members who are car owners to make rental unnecessary. And, if that is so, then we need only worry about petrol money from those hitching a ride. Otherwise, car hire fees will need to be figured on top of the workshop fee. Let's see what happens.

**FEES:** The fee for the workshop will be 30 £ for Artist and Fellow members, 35 £ for Associate members, and 40 £ for non-IAAA members (accommodation, car hire and museum fees not included). Send your workshop fee to me in sterling only, any bank charges pre-paid. Please make checks out to "Jackie E. Burns", at No.1 Park Side, Fort William Road, Vange, Basildon, Essex, SS16 5JX. If you have any queries about this workshop, please do not hesitate to email me at jackie@burns-arts.demon.co.uk - or telephone me at 44 1268 551 308. See you in September!



*A full length view of the strangely shaped asteroid Eros 433 taken by NEAR-Shoemaker on final approach, Feb 2000. Anybody got some sour cream and chives?*

# An INCREDIBLE Mission!



It's a dream come true - a scientific satellite that not only succeeds in collecting over 10 times more data than expected, but it also accomplishes near-miraculous feats it wasn't even designed for. That little miracle machine is the NEAR-Shoemaker probe.

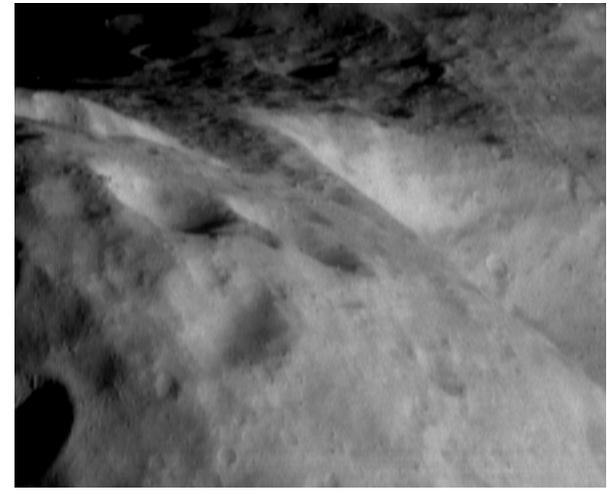
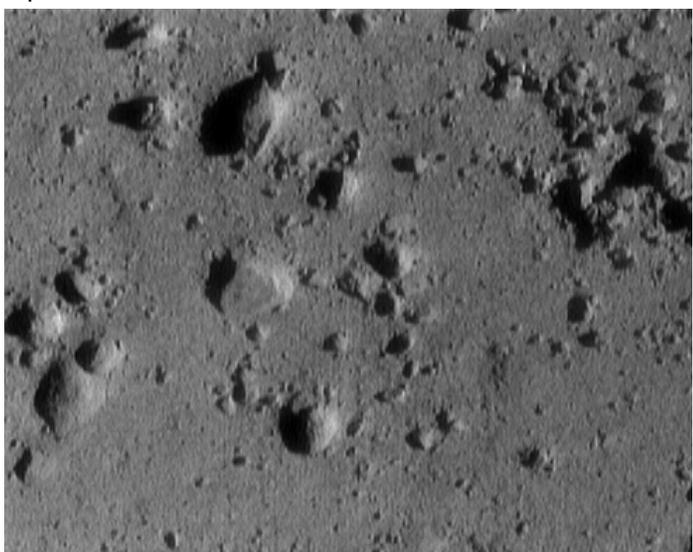
Named for the late legendary geologist Gene Shoemaker, the 1700 pound probe (with fuel) was designed and built by

*Artist's concept drawing of deployed probe.*

the Johns Hopkins University Applied Physics Laboratory and launched towards asteroid 433 Eros atop a Delta-2 rocket from Cape Canaveral on 17 Feb 1996. After a 4-year journey, the NEAR-Shoemaker finally arrived at Eros on 14 Feb 2000 and began examining the 21-mile wide irregular shaped asteroid in great detail. Sporting six instruments: a magnetometer, an X-Ray/Gamma-Ray Spectrometer (consisting of two sensors), a Multispectral Imager (the electronic camera), a Laser Rangefinder, and a Near-Infrared Spectrometer, NEAR Shoemaker shot over 160,000 photos and collected trillions of bits of data. The spacecraft, about the size of a small car, is made of eight 18-square-foot aluminum panels, and is 9 feet, 2 inches long when you include its main antenna. Its four solar panels, each 6 feet long and 4 feet wide, surround the 5-foot (1.5-meter) diameter high-gain antenna on top of the spacecraft. The projected total mission cost is \$224.1 million, including \$124.9 million for spacecraft development, \$44.6 million for launch support and tracking, and \$54.6 million for mission operations and data analysis. NEAR-Shoemaker's computer is a 16-bit machine called a 1750A. Based on

a military standard that is about 10 years old, it runs at 12 MHz and has 256 KB of storage - equivalent to PCs produced in the mid-1980s!

*The second to last image returned by NEAR-Shoemaker as it descended for landing. Taken at an altitude of 1200 feet. Smallest rocks are just 18 inches across.*



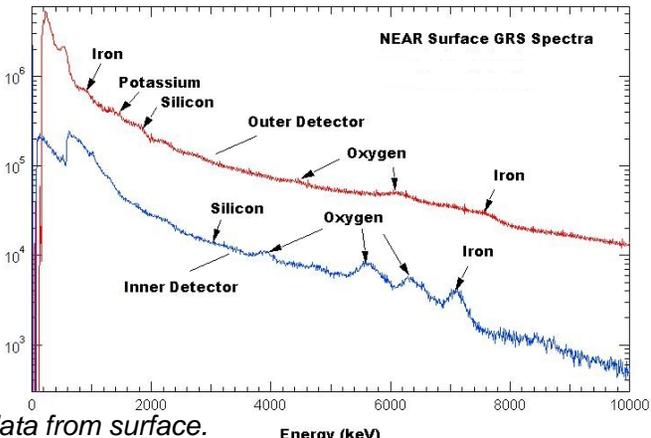
*Here's a view of Eros' eastern hemisphere. The blocky, angular appearance likely results from large impacts suffered by Eros early in its history. The image also shows several long ridges and a cluster of boulders. The entire scene is about 4 kilometers across.*

The NEAR Shoemaker mission was one of NASA's Discovery series. Its primary goal was to

answer fundamental questions about the nature and origin of the many asteroids and comets close to Earth's orbit. Eros' pristine surface offers a look at conditions in space when the Earth formed more than 4.5 billion years ago. Mission data was not limited to 433 Eros though. On its journey to Eros, the probe took several unique images of Earth and the moon, Comet Hyakutake, and the Beehive and Pleiades star clusters. NEAR paid the first visit to a carbon-rich "C-type" asteroid, taking several images of 253 Mathilde in 1997. NEAR also made an important contribution to the study of cosmic gamma ray bursts as part of the Interplanetary Gamma Ray Burst Network. The probe's Gamma-Ray Spectrometer was modified after launch with a software patch that allowed it to detect gamma ray bursts.

Like any space mission, NEAR Shoemaker had its glitches, but in the end, it achieved far more than originally intended. After almost a year in orbit of 433 Eros, mission planners decided to "roll the dice" and try for some more risky science. On 12 Feb the probe was commanded to land on the asteroid. Scientists were just hoping for the probe to survive the crash, but much to their surprise, it gently coasted down to a three point landing on its frame and two solar panels. Not only did it survive, but it was in perfect health! In an even more incredible stroke of luck, the gamma ray spectroscope was pointed down at the surface. NASA extended the mission for 14 days, allowing

scientists to collect gamma ray data 10 times more sensitive than orbital data. Finally, on 28 Feb 2001, over 5 years after launch, the probe was shut down, ending one of the most successful space missions ever.



*First set of gamma ray data from surface.*