

# The Focal Point

The Atlanta Astronomy Club  
Established 1947  
March 2003

Vol XV No. 10

Editor: Keith Burns

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## Seven Strangers?

by Dr. Tony Phillips

At the dawn of the space age some 40 years ago, we always knew who was orbiting Earth or flying to the Moon. Neil Armstrong, Yuri Gagarin, John Glenn. They were household names—everywhere.

Lately it's different. Space flight has become more routine. Another flight of the shuttle. Another visit to the space station. Who's onboard this time? Unless you're a NASA employee or a serious space enthusiast, you might not know.

Dave Brown, Rick Husband, Laurel Clark, Kalpana Chawla, Michael Anderson, William McCool, and Ilan Ramon.

Now we know. Those are the names of the seven astronauts who were tragically lost on Saturday, Feb. 1st, when the space shuttle Columbia (STS-107) broke apart over Texas.

Before the accident, perhaps, they were strangers to you. But if that's so, why did you have a knot in your gut when you heard the news? What were those tears all about? Why do you feel so deep-down sad for seven strangers?

Astronauts have an unaccountable hold on us. They are explorers. Curious, humorous, serious, daring, careful. Where they go, they go in peace. Every kid wants to be one. Astronauts are the essence of humanity. They are not strangers. They are us. While still in orbit Dave Brown asked, jokingly, "do we really have to come back?" No. But we wish you had.

Please see the NASA Home Page (<http://www.nasa.gov>) for more information on the Columbia Investigation.



## March Meeting

The March meeting is scheduled Friday March 21st. Our featured speaker this month is Dr. Tom Bopp of Comet Hale-Bopp fame. He will talk about the discovery of the comet and various things about the comet. The meeting starts at 8PM. Refreshments will be served out in the hallway from 7:30PM to 7:55PM. White Hall Building on the Emory University Campus is the location for the meeting. White Hall is located across the street from the New Math and Science Building.

The April meeting is also the annual AAC Banquet. There will be a few charged for dinner. Date for the banquet is April 12th. The speaker will be Chris Butler. He has spoken at both Astronomy Expos. Chris is a must see speaker for all. The banquet talks are non-technical and a real treat for all to see.



## Jupiter Moon Transit

For those interested in Video Astronomy, I have processed some more PlanetCam video from 01-16-03, and I feel I may have hit the mark. I'm sure it can be tweaked more, but after 2 nights and 6 plus hours, I'm gonna stop.

Taken with a 10" LX200 at f20, over 30

seconds of tape and 1000 frames analyzed and processed. Picture taken by Dan Llewellyn.

## Nominations for May Elections

By Keith Burns (Nominating Committee Chairman)

The nominating committee for the upcoming elections has been formed. The committee consists of Keith Burns, John Lentini, and Tom Crowley.

Positions open for the elections in May include President, Vice President (Speaker Chair), Vice President (Observing Chair), Recording Secretary, Corresponding Secretary (Newsletter Editor), and Treasurer. There will also be 3 board positions.

If you are interested in or want to run for one of these positions, contact one of us. If you are curious about one of these positions and need more information, please contact me or Tom or John. Is there someone else you would like to nominate for

one of these positions? Again please contact us.

I can be reached through email or phone at [Keith\\_B@Bellsouth.net](mailto:Keith_B@Bellsouth.net) and phone # 770-427-1475 evenings. John Lentini via email at [johnlentini@yahoo.com](mailto:johnlentini@yahoo.com) phone 770-984-0175. Tom Crowley via email at [crowleytj@hotmail.com](mailto:crowleytj@hotmail.com)

The only qualification for running for a position is that you be a good member in standing. Make sure those membership dues have been paid in other words.

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## Atlanta Area Astronomy Listserv

If you have email access with a computer, then you can subscribe to the Atlanta Area Astronomy Listserv. This is a source for up to the minute info on observing events. You can also post questions about astronomy. You can talk to fellow astronomers about the hobby or other things related to it.

Subscribe to the Atlanta Area Astronomy Mailing List: The name of the new list is: AstroAtlanta. The address for messages is: [AstroAtlanta@yahoogroups.com](mailto:AstroAtlanta@yahoogroups.com). To add a subscription, send a message to: [AstroAtlanta-subscribe@yahoogroups.com](mailto:AstroAtlanta-subscribe@yahoogroups.com). To cancel your membership, send a message to [AstroAtlanta-unsubscribe@yahoogroups.com](mailto:AstroAtlanta-unsubscribe@yahoogroups.com). Messages for the list-owner (me) go to: [AstroAtlanta-owner@yahoogroups.com](mailto:AstroAtlanta-owner@yahoogroups.com) or to [LAbbey@mindspring.com](mailto:LAbbey@mindspring.com). The "home page" for the list, from which you can change your account defaults is: <http://www.yahoogroups.com/group/AstroAtlanta>. This list is owned by Lenny Abbey.

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## New Treasurer

Harry Falise, who is the treasurer for our club resigned from his position for personal reasons. I have appointed Peter Macumber to fill the position until the end of term which ends June 1, 2003. Send all future treasurer related items to him.

President, Bear Simmons

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## Amateur Telescope Makers Group

Interested in building your own telescope? Want to enhance your current scope with some features or fix problems with it? Do you want to grind your own mirror or learn how it is done? This is the group for you. Contact him via phone (404-325-4987) or email ([scz9@cdc.gov](mailto:scz9@cdc.gov)) for more information and directions. Tracy Wilson runs the group and has much expertise to offer. You can contact him via email ([tracy@c2optical.com](mailto:tracy@c2optical.com)). Announcements of meetings will be posted on the AAC listserv. You can also find out about upcoming meetings from Skip.

## Get the Focal Point Online

The Focal Point is available online in PDF format. The PDF version is also in color. The free Adobe(R) Reader allows you to view, navigate, and print PDF files across all major computing platforms. Download the free reader at [www.adobe.com](http://www.adobe.com)

Visit [www.AtlantaAstronomy.org](http://www.AtlantaAstronomy.org) on the web. The link to Focal Points is located at the top of the front page of the website. If it works for you and you want to get the FP via email, send Peter Macumber an e-mail at [pmacumber@AtlantaAstronomy.org](mailto:pmacumber@AtlantaAstronomy.org). The Focal-Point web can be entered by using the Username of **AAC** and a password of **Moon**. These names are case sensitive! Type **AAC** and **Moon** exactly as you see it here.

The **Atlanta Astronomy Club Inc.**, the South's largest and oldest astronomical society, meets at **8:00 p.m.** on the third Friday of each month at Emory University's White Hall or occasionally at other locations. Membership is open to all. Membership fee's are **\$30** for a family or single person membership. College Students membership fee is **\$15**. These fees are for a one year membership.

Magazine subscriptions to Sky & Tel or Astronomy can be purchased through the club for a reduced rate. The fees are **\$30** for Sky & Tel and **\$29** for Astronomy. Renewal forms will be sent to you by the magazines. Send the renewal form along with you check to the Atlanta Astronomy Club treasurer.

<b>Club address is:</b>	<b>Treasurer's address is:</b>
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PMB 305	4300 Jimmy Carter Blvd, Apt #107
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Atlanta Astronomy Club Hot Line: Timely information on the night sky and astronomy in the Atlanta area. Call **770-621-2661**.

Internet Home Page: <http://www.AtlantaAstronomy.Org>

Send suggestions, comments, or ideas about the website to [webmaster@AtlantaAstronomy.org](mailto:webmaster@AtlantaAstronomy.org). Also send information on upcoming observing events, meetings, and other events to the webmaster.

*Author's note: This article was written in 1958. You will notice that a few things have changed. For instance, the "standard" telescope is no longer a 6" f/8 Newtonian, but a 8" SCT. Eyepiece focal lengths are no longer measured in inches but in millimeters. And wait until you see the prices! But Barlow lenses have not changed. I must beg your indulgence, as I have never owned a telescope with a correction plate, or an eyepiece with a millimeter.*

## The Barlow Lens

The present apparition of Mars has given many amateurs a rare opportunity to study this planet. Even at these close approaches the apparent disk of Mars barely reaches 25" of arc in size, so the observer must use a very high power if he is to see any of the more delicate markings. Unfortunately many telescopes that provide pleasing views of nebulae and clusters

at low powers simply fail to produce crisp, clear images under very high powers. But the amateur should not despair if his telescope fails this test. Many optically excellent instruments seem to be very reluctant to yield good high power views. The culprit is usually the high power eyepiece.

Consider the "standard" amateur instrument: the 6" reflector. The best power for planetary work with moderate apertures is about 40X or 50X per inch of aperture. For the 6" this would be from 240x to 300X. In order to easily achieve powers in this range, either long-focus mirrors or very short-focus oculars must be utilized.

Long-focus mirrors offer a convenient solution, as they are easy to produce. A focal ratio of f/10 would give 240X with readily available ¼" oculars. However, f/10 instruments are far more unwieldy than the standard f/8 format. To add insult to injury, the mounting must be sturdier and consequently more expensive. Such an instrument is ill-suited for low-power viewing of nebulae and clusters, which is also enjoyable.

On the other hand short focus oculars allow the observer to obtain high powers without sacrificing the popular f/8 design. Alas, this approach also has its drawbacks, and they are overwhelming. While ¼" oculars are not hard to come by, the 1/6" eyepiece required for 300X (with an f/8 ratio) would be very difficult to locate. Ultra-short focus oculars of conventional design are very hard to manufacture, and are generally not available in focal lengths of less than ¼". When they are offered, such eyepieces usually consist of a simple bi-convex lens (a design which dates from the early part of the 16th century). In order to produce short focal lengths the lenses must have very steep curves, therefore all aberrations are greatly exaggerated. This is especially true of the simple lens design in which only a small central area of the field of view is free from extreme chromatic and spherical aberration. The eye relief of these oculars is almost non-existent. With a 1/6" eyepiece, the cornea must be only a few millimeters from the lens if the full field is to be utilized. In such cases the centering of the eye is vital, yet is almost impossible to maintain.

What is to be done? Must the owner of a 6" telescope give up all hope of a good view of Mars? Of course not. The problem is centuries old, and so is the answer. In the early part of the 19th century Wolfius proposed that a concave lens be placed between the eyepiece and the objective lens (or mirror). He reasoned that since the positive objective lens caused light to come to a focus at a given distance from the lens, a weak negative lens placed somewhere between the objective and its focus would cause a slight dispersion of the rays and they would

*Continued on the next page.*

come to a focus at a point several inches beyond the normal focus. Moreover, the angle of the cone of light at the new focus would be sharper than that at the original focus. To the observer it would appear that the light rays were coming from an objective of longer focus, placed farther from the eyepiece. Thus the observer would enjoy all of the benefits of the long focus mirror without suffering any of its disadvantages. The actual curves for a lens of this type were first computed by Barlow, and were described to the Royal Society in 1834. Since that time this device has been known as a Barlow lens. It should be noted that the concave flint element of an achromatic objective lens is a sort of Barlow lens. By itself, the positive crown element has a focal length approximately one-half that of the achromatic pair. Of course, the purpose of the flint lens is not to lengthen the focus of the crown element, but to correct its aberrations with the equal and opposite aberrations of the flint glass.

There are several formulae which describe the performance of the Barlow lens. The effective focal length of the telescope with the Barlow is:

$$(1) F' = F * f / f - d$$

The Barlow's amplification is given by:

$$(2) A = F' / F = f / f - d$$

The distance of the Barlow inside the new focus is:

$$(3) d' = f(A-1)$$

In all three of the formulas  $F$  = focal length of the objective alone,  $f$  = the focal length of the Barlow,  $A$  = amplification factor,  $F'$  = effective focal length of objective and Barlow,  $d$  = distance of Barlow inside the original focus, and  $d'$  = distance of Barlow inside new focus.

In practical use, all you have to remember is that the effective power of the Barlow with an eyepiece of known power is equal to that power multiplied by the Barlow's amplification factor.

The great advantage of the Barlow lens is that comfortable low power eyepieces may be used to produce high powers. With our standard 6" f/8 reflector, a 1/2" eyepiece gave approximately 100X. By using a 3X Barlow, this same eyepiece produces 300X, yet the eye relief and apparent field of view are the same as that produced by the 1/2" eyepiece alone. Barlow lenses are usually supplied mounted in short extension tubes, one end of which fits into the eyepiece holder, with the other end slightly enlarged to accept the eyepiece. The amplification

of a Barlow is changed by adjusting the position of the lens in its tube. The farther away from the eyepiece it is, the greater the amplification. When a Barlow is advertised as "2X" this means that the greatest possible amplification is 2.

Of course the Barlow lens is not the perfect solution to the problem of high powers. Like any other lens, the Barlow is subject to chromatic and spherical aberration, as well as several forms of distortion. This is especially true of non-achromatic Barlows and Barlows which attempt to give too great an amplification. In a modern high quality Barlow these errors are kept so low as to be undetected. The upper limit on amplification, with current lens designs, is about 3X.

When shopping for a Barlow lens one should look for quality. The owner of our hypothetical 6" telescope has paid about \$75 for a mirror, \$6 for a flat and \$20 for an eyepiece. To expect good results by inserting a \$4 Barlow into the optical train is folly. When purchasing a good Barlow you will pay the same price as when buying another eyepiece, but you will be doubling the number of powers at your disposal. No one can deny that this is a bargain! Save a little longer and buy the best.

One final bit of advice. Never buy a zoom Barlow. They are always of mediocre quality. In fact, never buy a zoom anything. The extra optical elements required to provide the zoom function can easily double, triple or even quadruple the price. So the manufacturers compromise by reducing the quality. You don't want to have to learn this the hard way.

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## Board Meeting Feb 23/2003 3:00 p.m.

Present at meeting: Carol Abernathy, Bear Simmons, Sharon Carruthers, Peter Macumber, Chuck Painter, Keith Burns, Ken Poshedly, John Lentini, Phil Danneman, Tom Crowley, and Rich Jakiel.

Harry Felise resigned as Treasurer; Peter Macumber offered to take over the duties as Treasurer until the May elections.

### Board Reports & Old Business

Pres – Bear – Astronomical Society of the Pacific – Joanne has nothing to report. Suggestion that people use an "Off Topic" subject header when posting non-astronomical topics to the List. Tom Crowley offered to be the third person on the nominating committee, along with Keith Burns and John Lentini.

Speaker – Carol - after some review of dates, AAC Banquet will be on Saturday April 12; Chris Butler will be the guest speaker; location to be decided. March Speaker – Tom Boppe. May Speaker - ?

Observing – Sharon – 52 people at Jan Open House & Orien-

*Continued on the next page.*

tation; next one scheduled for March 8; Rich J will run this OP&O as Sharon & Peter will be absent. 10" Cave pier extended by Ralph Bowman. 20" mirror removed; Ralph is going to rebuild cell to make it easier to collimate. Scope loaner program is ready to go forward; info will be put in March *Focal Point*

Library – Fernbank cannot handle book check-outs; Bradley “may” have room for some bookshelves; suggestions for a movable library shelf (Bear) that can be taken to meetings; or bringing books to meetings in crates (Tom). Carol will approach Emory to see if we can move our General Meetings to the new Science Building and to see if they have space for a movable library cart that we can pull out for meetings.

Newsletter – Keith – *Focal Point* Deadline March 1

Woodruff – John – work party to insulate ceiling and re-do lights on March 1 at 12:00 p.m.; Club will supply lunch; plus a Scout Chili Cook-off for dinner.

Rauna Long plans to host 2 new comers socials a year. Phil D suggested nametags be available at meetings for newcomers & members who forget theirs at home. Also “greeters” to welcome them at meetings. Tom suggests we encourage all members to seek out & talk to new faces at meetings.

PSSG'03 – Ken submitted an estimated PSSG budget; target of 450 attendees with projected profits of \$11,380. Board asked for figures for 300 – 350 attendees.

PSSG will be extended to 4 nights (Wed – Sat); we will pay an extra \$2/person for exclusive use of the site; Port-A-Potties will be put on the field; light shields will be offered to owners of off-site streetlights; 10<sup>th</sup> anniversary patches. Suggestions to look at reduced pricing for families; and childrens' programs/activities.

Dark Site Search – Rich and Tom C. have a line on a site near Sparta for \$2 – 3,000/acre. Tom & Bear will check it out.

### New Business

AAC List – various options to deal with the problems of the List were discussed; the Board decided to create a List of “Do’s & Dont’s” to be posted periodically to remind users of the rules; and to see if Lenny needs any additional moderators to help him enforce the rules.

The Budget for 2003 was reviewed and will be submitted for a vote at the next Board Meeting. We are to send a letter to the residents of the subdivision across the street from the Villa Rica Observatory. The letter will introduce them to the AAC and “soft-sell” them to keep lights off. Phil D asks that we review all list postings to ensure that the information is correct  
Next Meeting: April 29th, 3:00 p.m.

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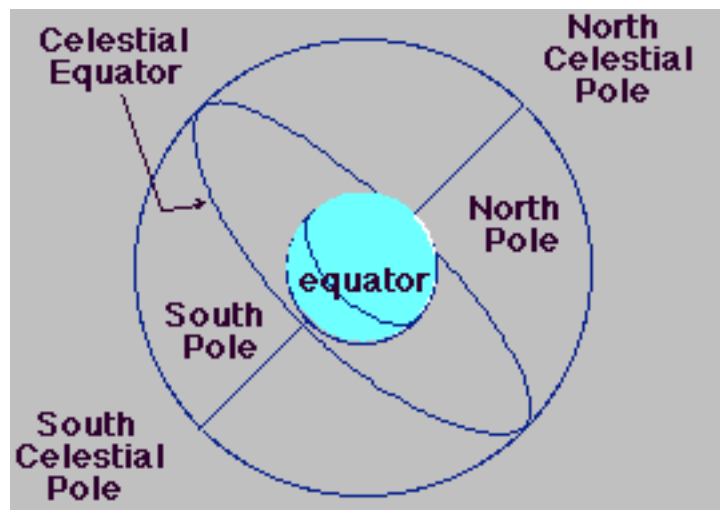
## The Sky 101: A beginners Introduction

### Part II: Mapping the Sky

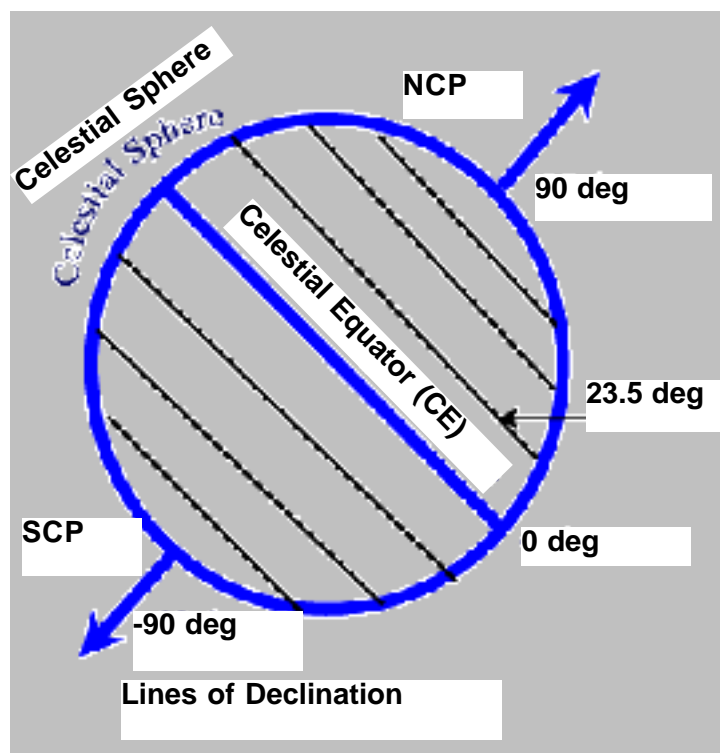
By Sharon Carruthers

In Part I, we looked at how the sky moves. In Part II, we will look at how we map of sky.

In order to fix the positions of objects, we create a mapping grid, much like the lines of longitude and latitude we use to map the Earth’s surface. We start by placing the Earth in the center of the *Celestial Sphere*. The stars and other deep sky objects seem to be on the surface of the sphere; and the shallow sky objects (those within our solar system) seem to be projected against it.

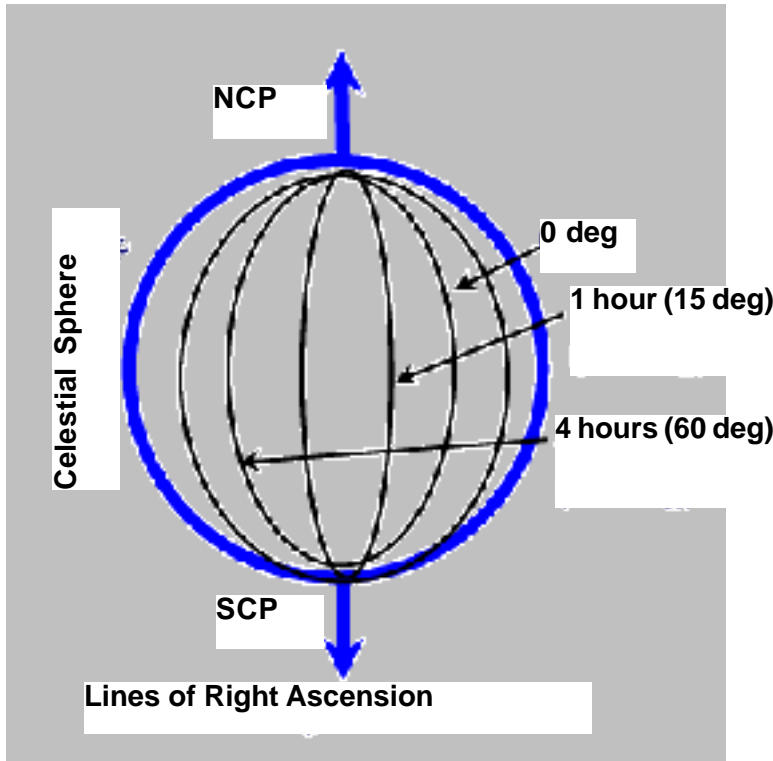


We extend the Earth’s north and south poles to create the *North and South Celestial Poles (NCP and SCP)* as the axis around which the Celestial Sphere revolves counter-clockwise; and we extend the Earth’s Equator outward to form the *Celestial Equator (CE)*(also called the ).



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To create the gridlines of our map, we then draw a series of circles around the sphere, parallel to the CE, out towards the NCP and SCP. These are the *Lines of Declination*, analogous to the lines of latitude. They are a measure of the angular distance an object is declined, or “bent”, above or below the CE. The CE is 0 degrees and we measure up to 90 deg at the NCP and down to -90 deg at the SCP. In this way we can tell if an object is above or below the CE: it is a + number if above and a - if below.



The CE is a sphere that rotates through 360 degrees in 24 hours. We divide this sphere by drawing *Lines of Right Ascension* from the NCP to the SCP, similar to the lines of longitude. These are called *Lines of Right Ascension* because, when you face the NCP, all objects ascend, or rise, on your right.

The CE is divided into 24 segments, called *hours*, of 15 degrees each. Each degree can be sub-divided into 60 arc-minutes and each arc-minute into 60 arc-seconds. It takes an object one hour to move 15 degrees. We must remember that an object near the CE will move over a larger area of sky in one hour than one near the CP's. Think of it like the spokes on a bicycle. The spokes near the wheel cover a greater distance than those near the hub, but they both do it in the same time.

If the CE is a sphere, where is the starting point, 0 hours? This is the position of the Sun at the moment of the *vernal (spring) equinox*.

We now have a mapping grid that enables us to locate any object based on its *Declination (Dec)* and *Right Ascension (RA)*. However, these positions are not fixed for all time, due to the *Precession of the Equinox*. But that is for the next installment!

## Spin-offs from Space

By Sharon Carruthers

Last month, our guest speaker, Glenn Burns, spoke briefly about some of the benefits of the space program – the “spin-offs” and/or technology transfers. These are new or improved products that were either created by or for NASA. He mentioned that ol’ standby, Velcro.

I was curious to find some other spin-offs from the space program.

NASA has also been publishing an annual magazine called (what else) *Spinoff* for 25 years. You can find online issues at: <http://www.sti.nasa.gov/tto/spinoff.html>

Each space center has its own Technology Transfer department, to promote the public and/or commercial use of space technology. Marshall Space Center in Huntsville, AL has a site that features many uses of space technology in our homes, hospitals and communities. Check out: [http://nasasolutions.com/at\\_home.html](http://nasasolutions.com/at_home.html)

Two other neat sites that discuss spin-offs are: <http://www.thespaceplace.com/nasa/spinoffs.html> and <http://seds.lpl.arizona.edu/technology/index.shtml>.

A partial list of spin-offs

Smoke detectors, Cordless power tools, Improved Home Insulation, “Pyrotechnic” Jaws of Life, Fire-proof fabric used by fire fighters, Dustbusters, Digital Image Processing: MRI and CAT scanning, Virtual Reality, Heart Monitoring Systems, Digital mammography, Infrared Thermometer (the “ear” thermometer), Helmet Padding, Global communications: cell phones; satellite TV; Global Positioning Satellites, Earth monitoring systems for air, water and the ground (such as Landsat), Scratch Resistant Plastics, Doppler Radar, Portable Cooling/Warming devices, and Freeze-Dried Ice Cream.

Some products were first developed for NASA to solve a problem (cordless power tools); in others, improvements were made on existing ideas that made them easier and/or cheaper to use (electrodes to monitor the heart & brain). NASA has developed tons of computer software to process and analyze all the data it collects either during a flight or from its satellites (For example, the digital image processing developed to study Moon photographs led to the development of the MRI). And of course, all satellite based systems depend on NASA actually delivering the satellite to orbit.

So where is Velcro on this list? It isn't. Velcro is the brand name of a product, generically called “hook and loop fasteners”, patented in 1952 by a Swiss inventor named George De Mestral. He was inspired by the cockleburs that stuck to his pants when he went on a hike. Velcro comes from the French *velour* (velvet) and *crochet* (hook). <http://www.velcro.com/>

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NASA may *use* more Velcro than a mother of 2-year old triplets, but it did not develop it.

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## NASA Solves Half-Century Old Moon Mystery

In the early morning hours of Nov. 15, 1953, an amateur astronomer in Oklahoma photographed what he believed to be a massive, white-hot fireball of vaporized rock rising from the center of the Moon's face. If his theory was right, Dr. Leon Stuart would be the first and only human in history to witness and document the impact of an asteroid-sized body impacting the Moon's scarred exterior.

Almost a half-century, numerous space probes and six manned lunar landings later, what had become known in astronomy circles as "Stuart's Event" was still an unproven, controversial theory. Skeptics dismissed Stuart's data as inconclusive and claimed the flash was a result of a meteorite entering Earth's atmosphere. That is, until Dr. Bonnie J. Buratti, a scientist at NASA's Jet Propulsion Laboratory, Pasadena, Calif., and Lane Johnson of Pomona College, Claremont, Calif., took a fresh look at the 50-year-old lunar mystery.

"Stuart's remarkable photograph of the collision gave us an excellent starting point in our search," said Buratti. "We were able to estimate the energy produced by the collision. But we calculated that any crater resulting from the collision would have been too small to be seen by even the best Earth-based telescopes, so we looked elsewhere for proof."

Buratti and Lane's reconnaissance of the 35-kilometer (21.75-mile) wide region where the impact likely occurred led them to observations made by spacecraft orbiting the Moon. First, they dusted off photographs taken from the Lunar Orbiter spacecraft back in 1967, but none of the craters appeared a likely candidate. Then they consulted the more detailed imagery taken from the Clementine spacecraft in 1994.

"Using Stuart's photograph of the lunar flash, we estimated the object that hit the Moon was approximately 20 meters (65.6 feet) across, and the resulting crater would be in the range of one to two kilometers (.62 to 1.24 miles) across. We were looking for fresh craters with a non-eroded appearance," Buratti said.

Part of what makes a Moon crater look "fresh" is the appearance of a bluish tinge to the surface. This bluish tinge indicates lunar soil that is relatively untouched by a process called "space weathering," which reddens the soil. Another indicator of a fresh crater is that it reflects distinctly more light than the surrounding area.

Buratti and Lane's search of images from the Clementine mission revealed a 1.5-kilometer (0.93 mile) wide crater. It had a bright blue, fresh-appearing layer of material surrounding the impact site, and it was located in the middle of Stuart's photograph of the 1953 flash. The crater's size is consistent with the energy produced by the observed flash; it has the right color and reflectance, and it is the right shape.

Having the vital statistics of Stuart's crater, Buratti and Lane cal-

culated the energy released at impact was about .5 megatons (35 times more powerful than the Hiroshima atomic bomb). They estimate such events occur on the lunar surface once every half-

*Continued on the next page.*

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## *The Focal Point*

Newsletter of The Atlanta Astronomy Club, Inc.

FROM:

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*We're here to help! Here's how to reach us:*

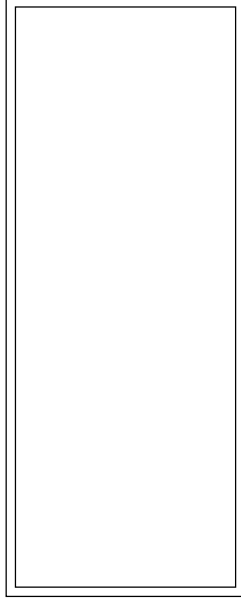
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FIRST CLASS



century.

“To me this is the celestial equivalent of observing a once-in-a-century hurricane,” said Buratti. “We’re taught the Moon is geologically dead, but this proves that it is not. Here we can actually see weather on the Moon,” she said.

While Dr. Stuart passed on in 1969, his son Jerry Stuart offered some thoughts about Buratti and Lane’s findings. “Astronomy is all about investigation and discovery. It was my father’s passion, and I know he would be quite pleased,” he said.

Buratti and Lane’s study appears in the latest issue of the space journal, Icarus. The NASA Planetary Geology and Planetary Astronomy Programs and the National Science Foundation funded Buratti’s work. The California Institute of Technology manages JPL for NASA. More information about NASA’s planetary missions, astronomical observations, and laboratory measurements is available on the Internet at <http://pds.jpl.nasa.gov> . Information about NASA programs is available on the Internet at [www.nasa.gov](http://www.nasa.gov) .

Jet Propulsion Laboratory, Pasadena, Calif. Don Savage.

### Calendar

**March 21st- General Membership Meeting.** Starts at 8PM. Refreshments from 7:30PM to 7:55PM. Speaker is Dr. Tom Bopp.

**March 22nd- Open House** at Charlie Elliott Wildlife Management Area.

**March 29th- Charlie Elliott Chapter AAC meeting.** Meeting to be held at the welcome center. Starts at 7PM. Observing to follow at field. Speaker TBA.

**April 5th- Deep Sky Observing** at Woodruff BSC near Blue Ridge, Ga.

**April 12th- Annual Banquet** of the AAC. Speaker will be Chris Butler.

**April 26th- Charlie Elliott Chapter** of the AAC meeting. Starts at 7PM. Speaker Philip Sacco. Topic of talk on Planet X aka Niribu.

Visit the new Charlie Elliott Chapter Website for more information on upcoming meetings and happenings. <http://touchmoon.com/ce/index.shtml>

### index.shtml

#### Newsletter Deadline and Info

Please send articles, pictures, and drawings on anything astronomy related. All formats are acceptable. Pictures can be sent as either JPEGs, GIFs, or other formats. I can also scan hard copies of pictures. Articles can either be sent to Keith Burns 3740 Burnt Hickory Road Marietta, Georgia 30064 or email at [Keith\\_B@bellsouth.net](mailto:Keith_B@bellsouth.net). You can submit articles any-time up and including the deadline date. The **deadline** for the **April issue** is **April 1st**.