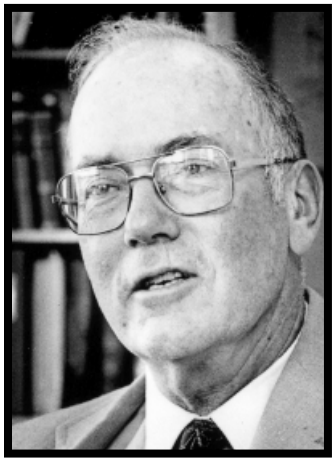
DIABLO ASTRONOMICAL SOCIETY

The Convergence of Science and Religion

April 24 2007 **Doors open at 6:45 p.m.**

Concord Police Association Facility 5060 Avila Road, Concord



Join us on April 24 when Dr. Charles Townes, winner of the 1964 Nobel Prize in Physics, discusses his advocacy for the inevitable convergence of science and religion.

As scientists discover more about the beginnings of the universe, the origins of the elements, and some of the most fundamental properties of matter, the role of religion has been increasingly questioned.

In his view, science and religion are much more parallel and usefully interactive than is generally recognized. Both represent humankind's efforts to understand our universe. Recent developments in basic sciences, particularly physics and astronomy, have increased productive interaction between the two and its discussion within the intellectual community.

Dr. Townes was awarded the Nobel Prize in Physics for his work on developing the maser (microwave amplification by stimulated emission of radiation) and laser (light amplification by stimulated emission of radiation). Other research has been in the fields of nonlinear optics, radio astronomy, and infrared astronomy. He and his assistants detected the first complex molecules in interstellar space and first measured the mass of the black hole in the center of our galaxy. More recently, Dr. Townes received the 2005 Templeton Prize, for his contributions to the understanding of religion.

Join us for what should be a lively and unique discussion.

Upcoming Programs:

May 22: Dr. Bruce Margon, UC Santa Cruz: Latest from the Hubble Space Telescope

June 26: Dr. Chris McKay, NASA Ames: Messages from Titan

Postcards from the Universe

by Rob Haitsma

One of the great things about being in any club is that you find out about events that interest you, whether they happen to be in your own club or another.

"Postcards from the Universe" was a talk given at the latest San Francisco Amateur Astronomers meeting, held at the Randall Museum in San Francisco by one of the world's premiere Astro-Photographers, R. Jay GaBany.

I first saw Mr. GaBany speak at last year's Advanced Imaging Conference and was blown away by his techniques using Photoshop during image processing to bring out detail and structures generally not seen in Astro-imaging. His talk at the Randall Museum was a modified version of his AIC talk, only less technical in nature and recalling his personal history in the hobby.

My sister (Liede-Marie), and I found out about his upcoming talk from Jim Scala through the MDAS Imaging message board and decided to attend. We very much enjoyed ourselves.

Mr. GaBany has come up with some very novel techniques in using Photoshop to enhance details and bring out structures within his images that just now, professional

(continued on page 7)

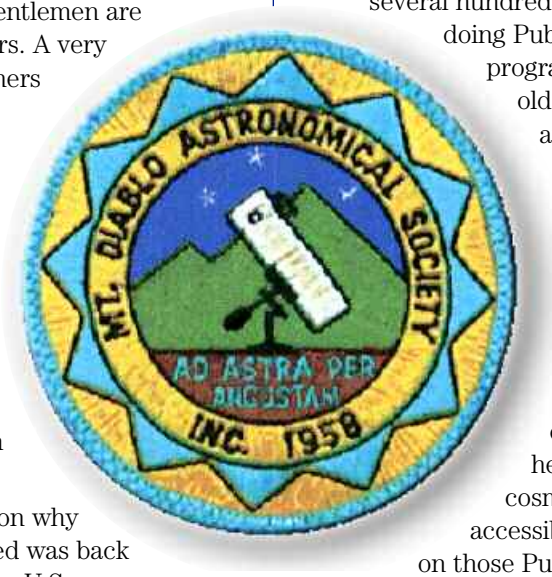
What's Up

Nicholas Tsakoyias, President of MDAS will present the Ancient Greek Astronomers.

President's Corner

A time to Commemorate and to Celebrate

Like the old song goes, "Does anyone know what time it is". Well I'll tell you. Fifty years ago this year Mt. Diablo Astronomical Society was founded. This was done by three amateur astronomers, their names are Bill Greenwood, David Stienmetz, and Clare Cochran. These three fine gentlemen are our founding fathers. A very short time later others joined. They are Donald Charles, Norm McRay, Jack Borde, Dennis Pisilia, Paul Schorth, Ernie Wilson, Ted Corderia, and Amee Glines. Our first membership consisted of eleven members



The main reason why our club was formed was back in 1957 was that the U.S. government started to launch their own satellites into space in response to Russia's first launching of the first satellite named Sputnik. The mission of our club and other astronomy clubs around the country was to visually track the U.S. satellite. Thus began operation Moonwatch and our club. Our club owes a lot to those pioneers.

Mark Your Calendars!

On June 9th we will be commemorating and celebrating this august event at our Public Astronomy event on Mt. Diablo, start time will be 7pm. At this event there will be ribbon cutting, and a few words about the early years of MDAS by some of those early members. Also after that we plan on having the cutting of a MDAS birthday cake to be served with refreshments. The event will then continue with our regular public program talk and public stargazing. Be sure not to miss this event, bring your family and friends and help us celebrate our clubs birthday with the public.

Also on October 23rd at our general meeting we will again be celebrating our 50th anniversary. We will have a regular meeting, with the exception that we will also have a pot luck dinner. More details will be available as we get closer to that date, so stay tuned.

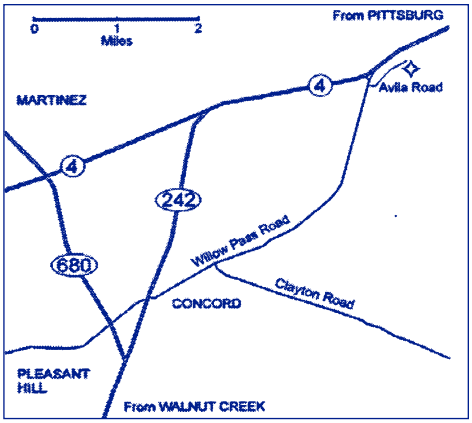
We've come a long way from those early years, way back in 1957. From humble beginnings of eleven members trying to help out our government, to several hundred members now doing Public Outreach programs to young and old alike at schools and up at Mt. Diablo. To forming a sister club (MDOA) for the purpose of building an observatory and warming room on the top of Mt. Diablo as to help make the cosmos even more accessible to the public on those Public Astronomy Nights and Events. We have had the honor and pleasure of having world renowned astrophysics', scientist, and professional astronomers give lectures at our general meetings. Many clubs in the Bay Area would truly envy our position and give anything to be like us, we are extremely fortunate to have had such a solid foundation laid down for us by those early members and continued through the efforts of members that have come by since. So take pride in the accomplishments of the club and help us commemorate and celebrate our 50th. Anniversary on June 9th on Mt. Diablo, and October 23rd at our general meeting. I hope to see everyone there.

Officers

President: Nick Tsakoyias 925-681-2511
claytonjandl@aol.com
Vice President: Liede Marie Haitsma
stfrncis@ix.netcom.com
Secretary: Rich Girard
rrgirard@ois-online.com
Treasurer: Wil Roberge
925-283-4871 wil@donahue.com

Board Members

At Large, New Member Mentor:
Steve Jacobs llasjacobs@astound.net
Meeting Program Chair: Marni Berendsen
Berendsen@aol.com
Librarian: Richard Crapuchettes
925-709-0492 richard.crapuchettes@solano.edu
Outreach: Jim Head
Publicity: Mark Stafforini
Badges hats jackets: Pam and Robert Cowart
nakiag@aol.com
Membership: Tom Harris
Observation Activities Chairman: Mike Elliot
Newsletter: Vianney Serriere
veloroute@hotmail.com
Mailing Address:
P.O. Box 4889, Walnut Creek, CA 94596-3754
925-695-3134
Web Address: http://www.mdas.net



MDAS meetings are held on the fourth Tuesday every month, except on the third Tuesday in November and December. Refreshments and conversation are at 6:45 p.m. What's Up? at 7:15 p.m. Speaker at 8:00 p.m. The Concord Police Association Facility at 5060 Avila Road is at the top of the hill east of Willow Pass Road, just south of Highway 4. Everyone is invited.

Please consider receiving *the Diablo Moonwatch* by email instead of the Postal Service. Saving in printing and postage is more than $5.00 per member. You will receive your issue sooner, view it in color, and if you wish can be printed as well on your own printer. Please send a request by email to inquiries@mdas.net.

Membership Demographic Adjustment Section.

To all members: If you have any questions or comments regarding your membership status, badges, addresses, and/or magazine subscriptions, please contact Tom Harris through www.mdas.net and/or email: memberinfo@mdas.net. *Thank you!*

Fingerprinting the Milky Way

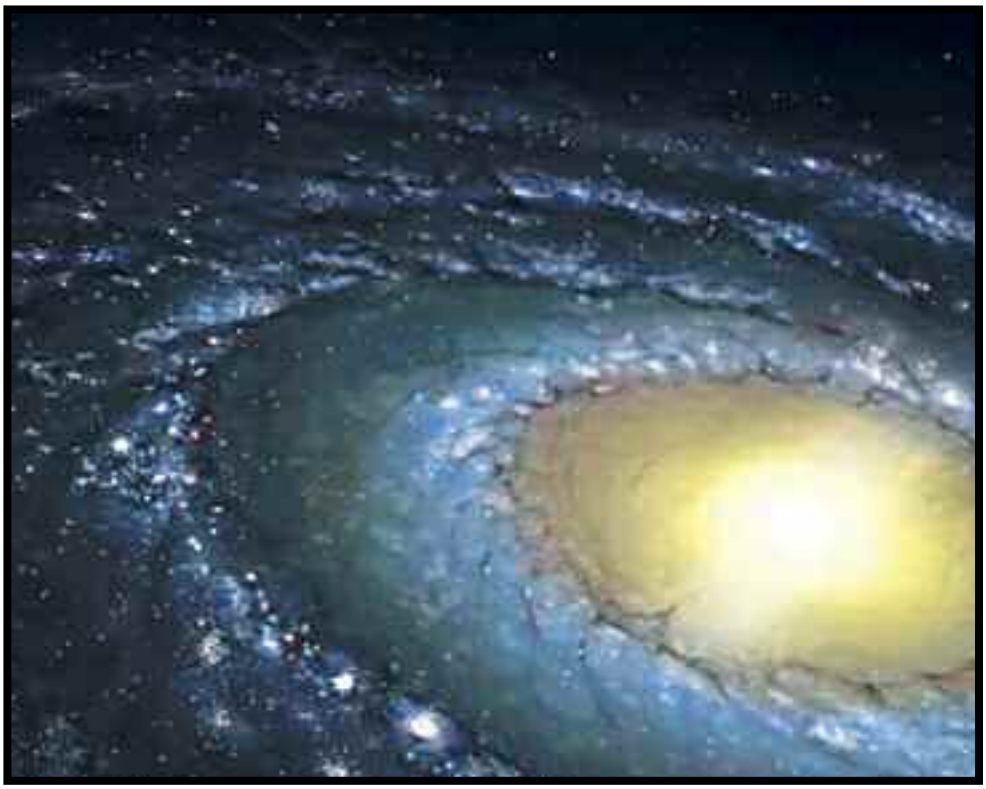
Chemical Composition of Stars in Clusters Can Tell History of our Galaxy

Using ESO's Very Large Telescope, an international team of astronomers has shown how to use the chemical composition of stars in clusters to shed light on the formation of our Milky Way. This discovery is a fundamental test for the development of a new chemical tagging technique uncovering the birth and growth of our Galactic cradle.

The formation and evolution of galaxies, and in particular of the Milky Way - the 'island universe' in which we live, is one of the major puzzles of astrophysics: indeed, a detailed physical scenario is still missing and its understanding requires the joint effort of observations, theories and complex numerical simulations. ESO astronomer Gayandhi De Silva and her colleagues used the Ultraviolet and Visual Echelle Spectrograph (UVES) on ESO's VLT to find new ways to address this fundamental riddle.

ESO PR Photo 15/07
The Cluster Collinder 261

"We have analysed in great detail the chemical composition of stars in three star-clusters and shown that each cluster presents a high level of homogeneity and a very distinctive chemical signature," says De Silva, who started this research while working at the Mount Stromlo Observatory, Australia. "This paves the way to chemically tagging stars in our Galaxy to common formation sites and thus unravelling the history of the Milky Way," she adds.



"Galactic star clusters are witnesses of the formation history of the Galactic disc," says Kenneth Freeman, also from Mount Stromlo and another member of the team. "The analysis of their composition is like studying ancient fossils. We are chasing pieces of galactic DNA!"

Open star clusters are among the most important tools for the study of stellar and galactic evolution. They are composed of a few tens up to a few thousands of stars that are gravitationally bound, and they span a wide range of ages. The youngest date from a few million years ago, while the oldest (and more rare) can have ages up to ten billion years. The well-known Pleiades, also called the Seven Sisters, is a young bright open cluster. Conversely, Collinder 261, which was the target of the present team of astronomers, is among the oldest. It can therefore provide useful information on the early days in the existence of our Galaxy.

The astronomers used UVES to observe a dozen red giants in the open cluster Collinder 261, located about 25,000 light years from the Galactic Centre. Giants are more luminous, hence they are well *(continued on page 4)*

2007 Public Program

Month	Date	Month	Date
May	19	July	21
June	9	August	18
		September	15
		October	13

2007 Society Nights

Month	Date	Moon Phase
April	21	
May	12	
June	16	
July	14	New
August	11	
September	8	
October		
November	3	
November	10	New
December	1	
December	8	

IMPORTANT REMINDER Just a reminder to all MDAS members, when driving up or down Mt. Diablo State park for a Public Astronomy Event or a Society Night please obey the speed limit on the mountain which is 25 MPH. Not only will you get a speeding ticket if caught by the rangers it is also unsafe to exceed that limit, being that the mountain has a very winding road and exceeding that speed may cause a serious accident to yourself and others including wildlife. Thank you, Nicholas Tsakoyias, MDAS President

Fingerprinting the Milky Way *continued from page 3*

suited for high-precision measurements. From these observations, the abundances of a large set of chemical elements could be determined for each star, demonstrating convincingly that all stars in the cluster share the same chemical signature.

"This high level of homogeneity indicates that the chemical information survived through several billion years," explains De Silva. "Thus all the stars in the cluster can be associated to the same prehistoric cloud. This corroborates what we had found for two other groups of stars."

But this is not all. A comparison with the open cluster called the Hyades, and the group of stars moving with the bright star HR 1614, shows that each of them contains the same elements in different proportions. This indicates that each star cluster formed in a different primordial region, from a different cloud with a different chemical composition.

"The consequences of these observations are thrilling," says Freeman. "The ages of open clusters cover the entire life of the Galaxy and each of them is expected to originate from a different patch of 'dough'. Seeing how much sodium, magnesium, calcium, iron and many other elements are present in each star cluster, we are like accurate cooks who can tell the amount of salt, sugar, eggs and flour used in different cookies. Each of them has a unique chemical signature."

The astronomers will now aim to measure the chemical abundances in a larger sample of open clusters. Once the "DNA" of each star cluster is inferred, it will be possible to trace the genealogic tree of the Milky Way. This chemical mapping through time and space will be a way to test theoretical models.

"The path to an extensive use of chemical tagging is still long," cautions De Silva, "but our study shows that it is possible. When the technique is tested and proven we will be able to get a detailed picture of the way our Galactic cradle formed."

Outreach

Jim Head

Shucks, we were rained out of our February starparties, breaking our run of many months without a cancellation. We are trying to reschedule them, but in the meantime we have many events coming up - here are some of our upcoming events:

April 19

Concord - El Monte Elementary School: http://www.mdusd.k12.ca .us/elmonte/ 1400 Dina Drive Concord, Ca 94518, (925) 685 - 3113.

April 22, 23, 24

Intel-Affiliated Contra Costa County 2007 Science and Engineering Fair needs Astronomy or Physics judges. Signup at: http://cceconptnr.org/ScienceFair/ (North Concord)

April 24

Public night at Mt. Diablo -- We will be hosting 3 other small groups an hour before the public activity. We need 2 or 3 others to help lead activities. Marni is off to Australian skies!

Coming up next month:

April 19

Walnut Creek Intermediate school starparty

April 29

Girl Scout training work-shop - Session #2 of 2. We are teaching a few older Girl Scouts to lead activities for the event on May 5th. Pleasant Hill

MDAS

YOSEMITE STAR PARTY

JULY 20—21 2007

FOR MORE INFORMATION: PLEASE EMAIL INQUIRIES@MDAS.NET

May 5

Mt. Diablo Girl Scout Astronomy program: 5:00 P.M. to 9: 00 P.M.

and more events to follow. . .

Send an email to: outreachinfo@mdas.net if you can help or attend any of these events. Thanks!

Solar System Notebook
The Amateur Planet Steps Up

Chris Go is coming to the Bay Area

By Jim Scala in the South China Sea nearing Shanghai.

Jupiter is called the amateur planet because it's visually rewarding in any size telescope and yields nicely to anyone who attempts planetary imaging. Chris Go of Cebu City, the Philippines captures excellent planetary images and discovered what became known as Red Spot Jr in 2006. His discovery attracted the attention of planetary astronomers everywhere. Although planetary astronomers at Caltech have predicted a seven-year surge in Jupiter's white spot activity, no one predicted a second red spot although many amateurs and professionals had hoped one would appear. Unfortunately, it hasn't yet been imaged by an amateur in 2007 and everyone is hoping it's still there. Several of Chris's Go's recent images illustrate what awaits people who are interested in imaging and want to give Jupiter a try.

Jupiter on March 17, 2007. Notice the Red Spot and two white spots in the band just above it. Planetary scientists had predicted an increase in white spots (cyclones) through 2012.

Chris Go will be speaking in the Bay Area this fall.

Chris Go, will peak at Santa Clara University this fall on planetary imaging and his discovery of Jupiter's Red Spot Jr.

Jupiter on March 18, 2007. Notice the detail in the Equatorial Band, the white spots in bands above and below the equator. They are visible in a four-inch refractor.

Anyone interested in planetary imaging can learn from Chris's seminar.

Observing Jupiter's four Galilean moons requires very little optical aid; 6X25 binoculars will do just fine. After all, these moons were discovered by Galileo using a telescope that probably was about equal to a good "toy" telescope of today. I have personally observed the shadow cast by Jupiter's moons (shadow transit) through a four inch refractor in fair seeing. However, observing a moon in transit requires an eight-to-ten inch SCT in good seeing. Refractors generally do better with their higher contrast. Indeed, Webcam imagers have captured shadow transits with three-inch telescopes and in good seeing I can routinely capture the moon itself in my nine-inch telescope. Image three shows Chris Go's recent image of Europa in transit.

Europa in transit March 21, 2007 in poor seeing. Much detail is visible in addition to Europa itself. Europa's shadow had transited when this was taken.

How do Chris Go's images relate to Bay Area imaging?

Chris Go images from Cebu City, Philippines where he is favored by very high humidity. Recall the Mars' images captured in Singapore and reprinted in S&T and Moonwatch that clearly showed what had once been called a "Martian Canal." Similarly, planetary imagers in Hong Kong routinely acquire spectacular images. There are few places with more light pollution than Singapore and Hong Kong. In addition, the Singapore imager works from the 10th floor balcony of a high-rise building. High humidity steadies the air allowing detail to come through on bright objects. Similar images are often obtained by amateurs in South Florida and Houston, Texas where somewhat similar conditions prevail.

Although the Bay Area doesn't have high humidity, we get somewhat similar conditions during "spare the air days" when still air, haze and air pollution combine. In these stagnate air conditions, deep-sky objects are hard to see. However, bright planets blast through like a hot knife through butter when fine detail on extended objects can be seen and imaged. Good planetary seeing also occurs when a high-pressure system sets in over the inland valley establishing westerly winds that transport dust and dry air into our area. Under these conditions I have often captured better than one arc second detail on the moon and planets.

(continued on page 6)

Solar System Notebook *continued from page 5*

Will 2007 Jupiter be a good option for Bay Area imagers in 2007?

During the next several years Jupiter is in low declination and poorly placed, but that shouldn't stop you. The conditions I described above usually prevail about once or twice monthly for several days in spring and summer. During these short periods of good seeing, low declination Jupiter can be captured on a CCD and visual observers can see excellent detail. Imaging during the two hours when Jupiter is at its highest near the meridian usually pays big dividends. This spring and Jupiter will prepare you for Mars in the fall which although at high declination, will be a serious challenge because it will only be about a third the size of Jupiter.

Images by Chris Go and printed with his permission.

Occam's Razor:

Applications,Consequences and a Challenge

By Jim Scala cruising the South China Sea.

During a seminar about the massive black hole at our galaxy's center the speaker observed that radio telescopes are quiet at wavelengths associated with the jets that emanate from pulsars. He said that more data will be obtained by the Square Kilometer Array with its vastly increased resolution, but that's a decade away. The speaker then said, "We can apply Occam's razor and conclude the accretion disk associated with the black hole has simply been depleted." His application of Occam's razor states that this is currently the best and clearest conclusion. Over five decades have passed since I heard Occam's razor invoked, so I did a little reviewing and was quite pleasantly refreshed by what I found.

What is Occam's razor and why was he declared a heretic?

William of Ockham (1285-1349) studied theology at Oxford, joined the Jesuit order in which he taught and investigated and wrote on theological concepts. He achieved academic immortality for his seemingly benign deployment called "the rule of ontological economy." In summary this rulestates, "Entities are not to be multiplied beyond necessity." This simple deployment became known as "Occam's Razor." However, this teaching got Occam accused of heresy, arrested in 1324 and quickly delivered to Avignon, France for trial. But, in addition to being smart, William was also fleet of foot; he escaped prison and made his way to Italy where he lived out his life.

Deployment, in the early Latin that William used, most easily described as the unfolding of an important and far-reaching truth. Unfortunately, *deployment* became associated with military operations and its early Latin meaning was lost. When Ockham published his deployment, Europe was deep in the Medieval Warm Period (modern man's first global warming), life was good, crops flourished and the church was reaping untold financial benefits as shown by the enormous cathedrals that were springing up everywhere. Religious leaders of the time didn't need a monk saying religion was really simple and that opulence was unnecessary. I suspect that branding Brother William a heretic was based on sound financial thinking.

William of Ockham

We use Occam's razor daily without conscious thought.

We all use Occam's razor without even thinking about it. For example, if the signal on your TV goes out you probably figure, there's something gone awry with the central signal and it'll come back again soon. You reject, without conscious thought, an alien spaceship has arrived in earth orbit and its electronics have knocked out our TV signals. Indeed, our subconscious mind simply cuts to the simplest conclusion based on limited information, knowledge and experience, and critical thinking discards other possibilities. It's similar to the old saying, "When you hear hoof beats, think horses and not zebras." However, if you happen to live on the African plain, your brain would simply reverse the animals in the statement.

Did William of Ockham find something fundamental about the human brain?

Occam's razor is apparently "hard wired" into our brain while we're growing up. It is constantly honed throughout life as our knowledge and experience accumulates and we seldom formally recognize the process. In contrast, the professor was formal in his use because by invoking it he said he had sifted through the data and came to a conscious conclusion realizing it was the best he could do without more information. He mustered all his experience gained in investigating pulsars and understanding the prodigious data others have accumulated. However, in contrast, I get the feeling some people don't apply Occam's razor at all.

(continued on page 7)

Occam's Razor: *continued from page 6*

Interesting situations in which people failed to apply Occam's razor.

People who believe the moon landings were faked clearly didn't impose Occam's razor. They increased complexity by invoking a vast conspiracy, including tens of thousands of people who would have perpetuated complex lies for decades. Do their machinations imply an adjunct of Occam's razor: Truth is always more economical? Another absurdity developed when Mars orbiters showed a rock formation that vaguely resembled a face. Some people concluded that a monument had been built on Mars by either a past Martian civilization or an alien, space-faring explorers. Never mind looking at the formation under other lighting angles or searching the area for evidence of construction. Rather, they immediately invoked what would have been the most profound discovery of all time. Do their actions mean that Occam's razor doesn't always get wired in?

Giordano Bruno

Did an application of Occam's razor cost Giordano Bruno his life?

Giordano Bruno (1548-1600) became a Dominican Monk and an important church scholar. He studied Copernicus' theory, including his evidence that the Sun was at the center of the solar system. In addition, he read many texts that dealt with astronomy and spoke regularly with scholars interested in astronomy. After extensive study, he concluded that Copernicus was correct. He based his conclusion on evidence available and respected scholarly views. What he concluded reached beyond Copernicus and was incredibly insightful in 1590. I have summarized Bruno's conclusions as follows:

In space there are countless constellations, suns and planets. We see only the suns because they give light while the planets remain invisible because they are dark and small. The stars we see are other suns like our own; some are even more magnificent. Numberless earths are circling around their suns, no worse and no less than this planet of ours. No reasonable mind can assume that heavenly bodies that may be far more magnificent than ours would not bear upon them creatures similar; even superior to those upon the earth.

Taking into account the knowledge in 1590 (Galileo was studying other things), Bruno's conclusions square nicely with actuality. However, it was totally at odds with the religious thinking of the time. When the church declared his concepts heretical, Bruno got no support from any religious or scientific source the church recognized. Even though he had resigned from the Dominican order, Giordano was bound over to the inquisition for trial. His trial lasted seven years while he remained in prison and his sentence, burning at the stake was carried out.

Bruno did what all scientists and most people do routinely. He integrated the incomplete albeit compelling information available to him and applied Occam's razor by saying, "This is what I conclude." The rest is history.

Consider a modern question and then apply Occam's razor.

We all know that our universe is expanding. Evidence indicates that the universe is about 70% dark energy and about 25% dark matter that we cannot see. Only a small percentage of the remaining 5% is matter we can see and measure. Scientists are constantly accumulating data to reduce the uncertainty in these findings. During a recent discussion with Dr. Don Goldsmith, a respected astronomer and author, he raised the following question:

"As the universe expands and space increases, does its composition remain the same?" In short, is space everywhere about 70% dark energy? Does matter (dark and baryonic) simply become diluted as the expansion continues?

Conceptually this question is a somewhat modern equivalent of the question Giordano Bruno addressed. It raises the issue of energy creation and what becomes of matter. I challenge you to read the extensive writings attend seminars on the expansion and generate your own conclusion in the tradition of Occam's razor. I'd be interested in discussing the reasoning that led you to your conclusion.

Postcards from the Universe *continued from page 1*

astronomers admit to seeing in some cases, for the very first time. There were 2 galactic images in particular, one showing a much more extensive structure of spiral arms emanating from the galaxy and another image clearly showing what is probably remnants of a smaller galaxy "looping" around a larger galaxy when the two met their fate long ago. While both images are still unpublished, the process of them being verified by astronomers is all but finished. His techniques allowed these details to be brought out and viewed. As a final test, he was sent images taken at several observatories to see what the new techniques could bring out. They had suspected the presence of greater structures, but could not confirm… Mr. GaBany's work on them proved his technique and their suspicions correct.

R. Jay GaBany reminds us that great work in this field is yet still being done on an amateur level (albeit, a very talented and dedicated amateur) using commercially available equipment and computer applications.

My sister and I both very much enjoyed this Astronomy "side-trip". Find out what's going on, both in and amongst the other clubs in the area and enhance your overall interest in this great hobby and passion.

Thank You

By Bill Paracka

I was truly impressed with Dr. Heldmann's presentation for it was an exhilirating evening! I did talk to her briefly about Moon Rocks brought back by our Astronauts, as I often wondered about the density of hydrated minerals on the surface. Her reply answered a long standing perplexity of mine as to why we never returned there — she advised that the moon is completely dry, so insofar as an alternate supply of water might be contemplated by mining the surface, it would be useless .

Dr. Jennifer Heldmann

It will be an absolute victory if there is water at the south Pole, making our Mars objective that much more reasonable. Someone else asked her about her academics and she voluntered that she first matriculated at Colgate University - that's in Hamilton, New York, almost dead center on the map and just 6 miles from my Ag & Tech experience at Morrisville, New York in late 1940's on the GI Bill. Morrisville Ag & Tech is now a unit of SUNY (State University of New York) but was a lonely little campus when I attended, just one of many schools established in a cooperative venture with California to discover the best answer to post-secondary education, i.e., a 2-yr Ag & Tech school, New York Style, or the California Junior College prototype. I voluntered how we fraternity brothers did a night time foray on a black shale cliffside close to Hamilton, painting our Greek Letters there alongside many others, mostly Colgate Frats.

That Cliffside happened to be familiar to her as it is on a route that she traveled many times on her way to Syracuse U niversity. All of the above to simply say " it's a small world ".

Thanks again for your response. I will make sure we chat a bit at my next opportunity to attend a monthly meeting. I am blessed with my opportunity as an Enthusiast to be a member of MDAS and thank you all for inviting me to join.

Mount Diablo Astronomical Society
P.O. Box 4889
Walnut Creek, CA 94596-3754