Mount Diablo Astronomical Society

Diablo MoonWatch

June 2012

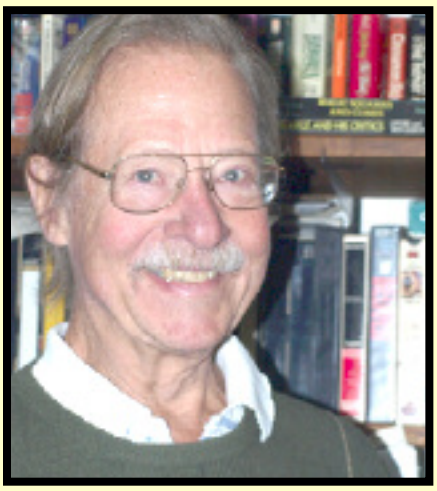
General Meeting

Tuesday June 26, 2012

What is Dark Energy?

By Dr. Michael Lampton

Doors open at 6:45 p.m.
Concord Police Association Facility
5060 Avila Road, Concord



Since 1998, astronomers physicists and cosmologists have been struggling to explain the Dark Energy phenomenon.

Specifically, the expected deceleration of the distant universe is not happening: for these last 5 billion years the universe has apparently begun to accelerate, as if something is profoundly haywire with gravity, space, or time. I will describe a few astronomy projects that are gathering data that bear on possible explanations,

Dr. Michael Lampton has served in science positions for eight space flightastronomy missions and spent eleven years in the international Payload Specialist astronaut program. He is now semi-retired from his research position at UC Berkeley Space Sciences Lab, but continues to help Berkeley's BigBOSS astronomy project. Mike created and runs Stellar Software of Berkeley, well known to optical design people worldwide.

What's Up

Sharing the Universe with and without a Telescope:

The universe comes alive through the stories you tell at the eyepiece and away from the eyepiece. Marni Berendsen will share the tools available to you through our membership in the NASA Night Sky Network - stories, activities, and demonstrations that make it easy for you to inspire others to discover more about our universe, whether you have a telescope or not.

Marni

Cosmic Rays & Evolution

by Nathaniel Bates

Many of my readers remember the days when the American government calmed the population's fears about radiation by stating that radiation "helped evolution." Personally, I get concerned whenever anyone claims to want to help my evolution, most of all the nuclear industry. Call it an intuition, or call it a prejudice, but as prejudices go it is one of the more reasonable. And yet, there is a legitimate scientific question around what has given rise to mutations throughout the history of life on Earth, both the helpful kind and the harmful kind. Maverick scientist Henrik Svensmark has suggested that cosmic rays from supernovae have affected climate change over the history of the planet, thereby affecting the evolution of life on the planet during key phases of the history of life. He claims to have mapped important periods of evolutionary change on the planet to certain key geological factors, but also to one extraterrestrial factor that seems counter-

(Continued on page 7)

President's Corner

A Tale of Two Transits

by Chris Ford

As we all know, the past month witnessed two notable crossings of the Sun.

First an annular eclipse by the Moon followed 15-days later by a rare transit of Venus. I took the opportunity to photograph both of these events at optimal viewing locations, and as much as the pleasure of witnessing a transit as a personal experience is highly satisfying, equally compelling is the public reaction and social experience of each event. To convey a sense of occasion for those who were unable to witness either event directly, I am devoting this months Presidents Corner as a photo-essay.

Both events of course had in common a requirement for solar viewing equipment, either special eclipse glasses, telescope filters, or more elaborate solar viewing and projection equipment.

Both events were day time astronomy requiring sun-screen rather than a thick coat. Another common characteristic was the presence of clouds that occasionally got in the way. In fact I suspect it was exactly the same cloud going round in circles for the 15 days that separated the two transits. (It looked suspiciously similar!)

First was the annular solar eclipse on May 20th 2012 that most of us witnessed at some point. Any number of viewing locations were available to observers along the Northern California center line, and the venue I am picturing here is the Hat Creek Outlook near Lassen. There were at least 100 people present including a number of MDAS members, other astronomical societies and individuals, along with passing travelers, campers, and the interested public. Simply this felt like a great social occasion as much as it was an astronomical viewing event. There was great energy and excitement, especially from the passing public that I will remember for a long time.

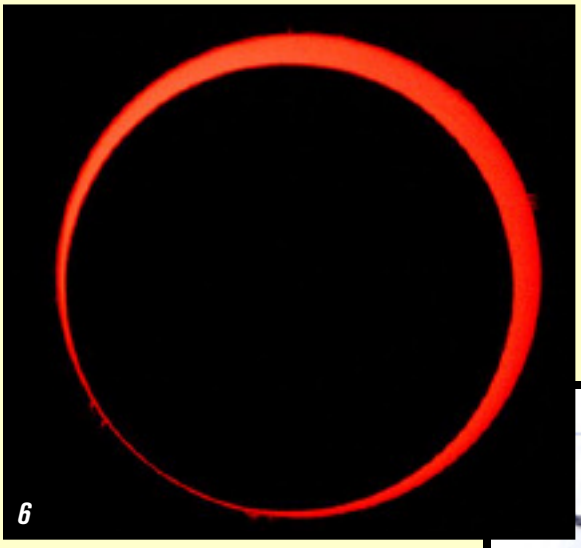
(1) Early afternoon setup. Former MDAS President Richard Ozer checking out a Coronado solar scope along a battery line of telescopes that started growing at the Hat Creek Outlook. The sky was quite cloudy at this time but with clear intervals.

(2) Pete Santangeli of the East Bay Astronomical Society setting up a Sun Funnel at the front line in the afternoon hours before totality. The sheer variety of solar observing tools was very notable including Herschel Wedges, various filters on telescopes of all types, dedicated solar telescopes, and some very inventive projection techniques. Later as the moment of the eclipse approached, a sharp observer suddenly shouted that the first bite out of the edge of the Sun was visible as first contact occurred.

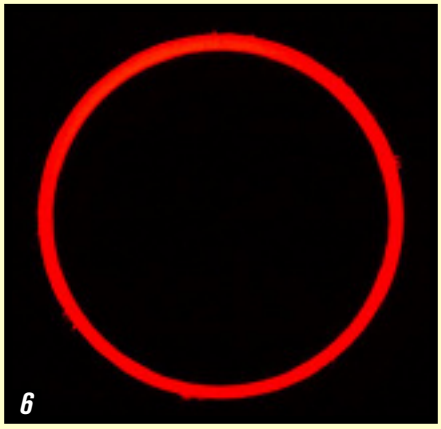
(3) As the eclipse commenced towards the end of the afternoon and progressed towards the annulus, the first characteristic double shadow effects began to become obvious. Several members of the public began having a lot of fun taking pictures of their shadows projected against the backs of cars and the ground. The sense of anticipation and mounting sense of something important about to happen was very tangible at this point. The light quality began to start changing notably also.

(4) As the full annulus approached the light quality began to change more substantially, it became darker and cooler, a breeze started to pick up, and there was a sense of time changing its pace. As the local time was now after 5.00 pm the Sun was quite low and easily visible under the clouds. The shadows were longer and more dramatic as well, and if the moment of totality did not cut off the Sun completely there was a very powerful sense of occasion that all under the center line felt. There were a significant number of members of the public at the Hat Creek Outlook who were camping in attendance, almost all of who found the annular eclipse quite profound in ways they never expected.

A Tale of Two Transits *(Continued from the previous page)*



(5) As the annulus began to form I started photographing the Sun through a Lunt LS-152 hydrogen alpha solar telescope using an unmodified Canon 40D digital DSLR camera, and was also able to capture the prominences from the edge of the Sun as the Moon blocked out a large proportion of the Sun's light.



(6) A perfect ring of fire in hydrogen alpha light at the exact moment of totality under the centerline at Hat Creek Outlook showing the solar prominences quite well. There is something particularly minimalist about this type of view that I personally find quite compelling. A veritable ring in the sky. Of course the Sun was still far too bright to see it this way with the naked eye, but the ring was very obvious even when viewed through simple paper solar viewing glasses.

Just 15 days later on June 5th 2012, saw the occasion of the last Venus Transit this century with the next one scheduled in 2117. The viewing location for this event was the entrance to the Juniper campground on Mount Diablo.

(9) Fisheye view of the Juniper camping ground entrance parking lot when it started getting busy as campers and members of the public started dropping by. This event was well advertised and attracted a large attendance.

(7) Our esteemed newsletter editor Vianney setting up his solar filter. In the foreground my 130 mm refractor with a Baader Herschel wedge for white light viewing, and in the middle the Lunt LS-152 hydrogen alpha solar telescope tracking the Sun on an equatorial.

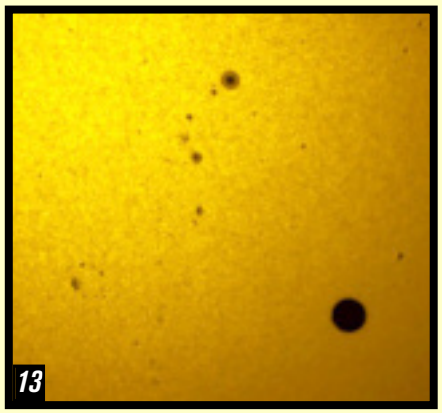
(8) At least 11 MDAS members set up solar telescopes for this public viewing event. If you were there, look carefully, you may be in these pictures! Note the same cloud has followed from the Hat Creek Outlook.

(10) Just as at Hat Creek, clouds were an occasional problem with the Sun being partially blocked for probably 40% of the time. Luckily during the actual moment of first and second contact just after 3:00 p.m., the Sun was completely unobscured and everyone was able to witness the commencement of the transit directly. Here several members of the public join in the experience. One small surprise to me personally, was that Venus was directly visible to the eye when viewed through simple paper solar glasses without any magnification at all. In fact a number of observers commented that Venus looked bigger against the Sun than expected. Whether that is compared to the 2004 transit or a simple optical illusion I am still not sure, but it certainly seemed that way.

A Tale of Two Transits *(Continued from the previous page)*

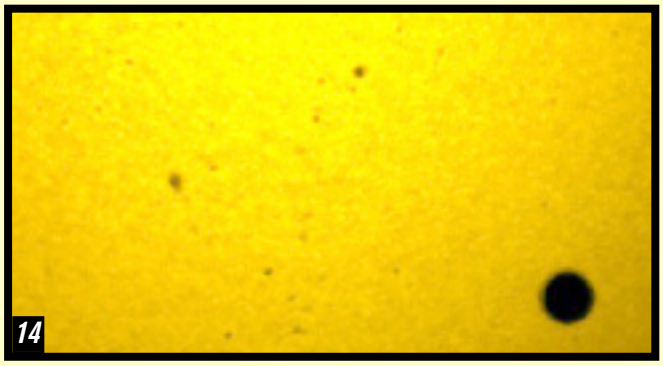
(11) As the transit progress throughout the afternoon from around 3.06 pm onwards the viewing area became busier and the general atmosphere more relaxed.

(12) Those who had a cellular phone (almost everyone) wanted to try taking pictures afocally through the hydrogen alpha solar telescope and generally most were successful in doing so. In fact many observers were more interested in the "flames" on the Sun (prominences) than the big black dot crossing its surface!



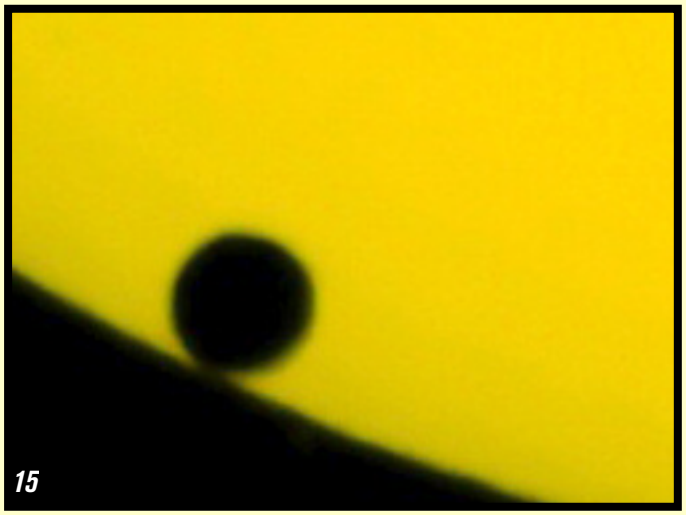
(13) Venus traveling across the face of the Sun through a field of sunspots. I photographed this image through a Baader Herschel wedge in white light with my unmodified Canon 40D DSLR.

3rd and 4th contact as Venus excited the Sun's disc was not visible from California as the Sun had set by that time. This was a very memorable occasion though, made more potent by the simple realization that the final views we were seeing through the telescope as the Sun set, would not be repeated for another 105 years.



(14) Venus against the Sun in white light again. Solar prominences are not visible when imaged this way as the hydrogen alpha telescope was being used visually at the same time.

A somewhat sobering sense of ones mortality against the slow clockwork rhythms of the solar system. Next up though, a full solar eclipse visible from North America in 2017!



(15) The exact point of second contact at around the time of the noted teardrop effect. One observation I was unable to capture photographically through the 130mm refractor and Herschel wedge, was the light shining though Venus's atmosphere as it crossed the edge of the Sun. It was a quite beautiful sight, as the Sun's light transmitted through the atmosphere from behind and created a slight and faint glowing arc visible through the telescope

Astronomical Imaging: Unintended Consequences

By Jim Scala

Astronomy has been part of me since eight. As the years accumulated, my interest waxed and waned but it always lurked in the background. In 1979, I built what evolved into a comfortable backyard observatory. I started taking images with film.

Around 1990, the Charged Couple Devise (CCD) was introduced. Primitive at first, CCD imaging slowly became easier and pictures displayed on the computer screen were infinitely better than film. It was easy to share my work with other similarly interested amateurs – it had opened a new world.

In 2005, I caught a particularly good image of Saturn that showed its spectacular rings. I sent it to some friends and family as a way of saying, "I'm keeping on keeping on, and look what I did." They said they enjoyed my image and to send more – my ego was boosted.

Slowly my list of people grew and occasionally someone I'd never met asked to be put on my list because a friend had forwarded an image to them and they wanted them directly. It was flattering, and I obliged.

Even the head of NASA Ames asked, "My nephew sent me your recent image of the Full Moon. With your permission I'd like to use it in my talk to visiting Senators. It's quite spectacular." I thought, it doesn't get better than this. I was wrong.

Two people eclipsed everything and made me feel great. I've never met them – probably never will, but I have come to know and love them.

The Full Moon

The Largest Full Moon of 2012.

When Julian asked to be placed on my list, I noticed his German e-address. I learned that he was a teacher, had married a German girl, and they settled in her home town where he taught in an American school. Julian asked about my Full Moon images so often that I finally asked him why. I explained to him that as images go, they're rather simple and easy to capture. I kept asking him why the Full Moon was so important; he finally explained. He had never told anyone – not even his wife – why the Full Moon meant so much to him. It's about life and living.

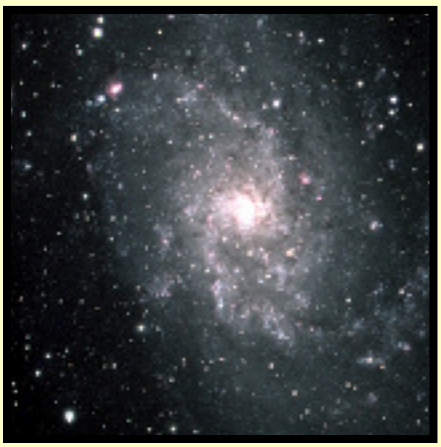
In a Viet Nam fire fight he took two bullets; one in his right leg and another waist high, on his right side. A corpsman stopped the bleeding, dressed the wounds and placed Julian along with other wounded men on the river bank just below the line of fire. They gave him – and other badly wounded men – morphine. The unit was in bad shape, it was getting dark, but they were holding on. It was going to be a long night.

What he said was hard to for me – or anyone who never went through it – to grasp, "The Captain told us there'd be no evacuation, and we should do our best to stay alive. He promised they'd hold on, air support would come in the morning and things would turn. As I lay there, I could see the full moon rising on my right. Even in the heavy, wet Viet Nam air it was bright. By then I wasn't feeling pain – I was groggy. But I knew it was the Moon I saw."

He explained how he drifted in an out of consciousness. "When I did open my eyes, I could see the Moon and knew I was still alive. It was beautiful, it moved a little each time I looked, and I could tell that time was going forward."

Astronomical Imaging: Unintended Consequences *(Continued from the previous page)*

When the Moon was sinking to his left things changed. "The morphine had worn off, and I could tell that dawn was coming. All at once the F-100s came over lower than I'd ever seen. Shell casings from their cannons rained down on us wounded guys. After many passes – and many shell casings –helicopters came. First, the gun-ships came, and then the medivacs. While they carried me to one near the river, I saw the Moon again, one last time, I knew I'd live."



M-33, A Galaxy much like our own about 2.4 million light years away.

Jeanette Colville asked to be placed on my list in late 2006, after she received an image of M-33, a Galaxy 2.4 million light years away. It's similar to our galaxy, albeit a little more diffuse, and we see it face-on – as if we're flying over it. By any measure, it's spectacular. I learned she lived in Iowa, was sixty, and liked to sit outside in the dark night sky and enjoy the stars. She was curious about the distances.

"What do you mean when you say something is 2.4 million light years away?" I explained how fast light travels and that rather than use miles, we use light-years because it's more convenient than enormous numbers of miles or expressing them with scientific

notation. I had also sent an image of M 13, a globular star cluster that's in our galaxy, and it's only 25 thousand light years away – a comparative cosmic hop. That got her thinking even more about mind-boggling distances in time or miles.

M-13 A star Cluster in our Galaxy about 25, 000 light years away.

I said, "We see M-33 as it was 2.4million years ago. If we could see people there, they'd be in our remote past – long before humans appeared on earth." This blew her mind, and I added, "If there are people there now, looking at our galaxy, they couldn't see us because we're way off in their remote future." She had some trouble getting her mind around those concepts. But, she persisted.

We corresponded about distances, space-time, and the confusing paradoxes in both caused by general relativity. One day I received a startling e-mail. "I left my church. I have begun attending the Unitarian Church. You hooked me on science, and I couldn't accept their teachings any longer."

I was blown away and asked for an explanation. How could my simple images and our e-mail discussions have triggered such a life altering change?

Jeanette's fundamentalist church taught that everything was created six thousand years ago, evolution was a hoax, and man had lived alongside dinosaurs. Our discussions of light years, cosmic distances and time started her quest for knowledge. She became a regular in the local library, concluded from her studies that fundamentalism was wrong, and that Darwin and Einstein were right. She took a different path.

She said it simply, "Your images started me on the most gratifying adventure of my life. I can't tell you how free and elated I feel."

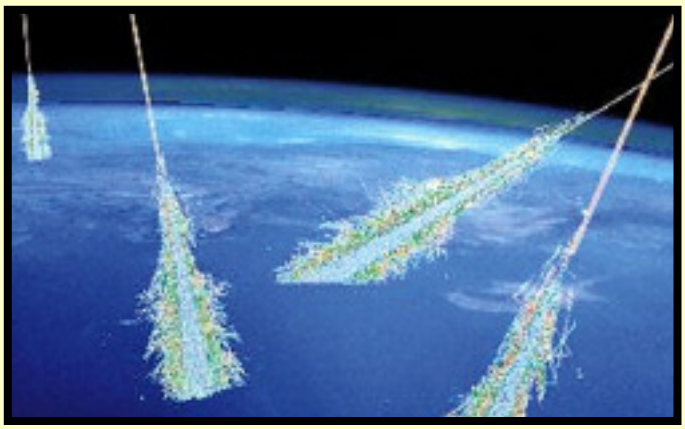
I had never thought that my simple astronomical images could influence someone's life. I was only saying, "I'm still here, keeping on keeping on, and look what I can do."

Cosmic Rays & Evolution (Continued from page 1)

intuitive, local supernovae explosions. Radiation from these supernovae presumably affected the climate in such a way that the evolutionary process was redirected dramatically. I retain some skepticism about the claims of Dr. Svensmark, partly given his political alliances with financial and political interests that want to deny human-made climate change. At the same time, I am going to separate his ideas about evolution from the issue of climate change, and explore the possibility that cosmic rays affect evolution because I myself have wondered about enigmatic and still unexplained shifts in the evolutionary history of life on Earth such as the Permian Extinction and the Cambrian Explosion.

Evolutionary biology is a complex field of science, and cannot be easily explained in a few short sentences.

I will try my best as a layman to encapsulate some key ideas. Firstly, the concept of evolution does not imply that the Universe is an accident. Fossil discoveries do not constitute a theological debate, nor do they "disprove" the idea of an order of plan to the Universe. The writings of Richard Dawkins and other thinkers who have suggested that evolution makes theological pronouncements do not help the cause of public acceptance of evolutionary science. In the same line of thinking, evolution also does not imply the idea of "survival of the fittest" in the sense that every creature is at the throat of every other creature. Social Darwinism and eugenics were both political positions advanced to legitimate injustices and inequalities in society. They are not the inevitable conclusions of evolutionary biology. Darwin himself may have accepted some of those ideas, but he did so as a part of the society of his time and not because evolutionary biology naturally leads to those ideas. Very simply put, Darwinian evolution in its most austere form is not about religion or politics. It is a scientific claim that deals with the evolution of species, leading from the simplest evolution between species and then extrapolating out to the broader question of the tree of life itself.



Darwin made no claims about the origins of life, because the science involved with the origin of life was not known during his time.

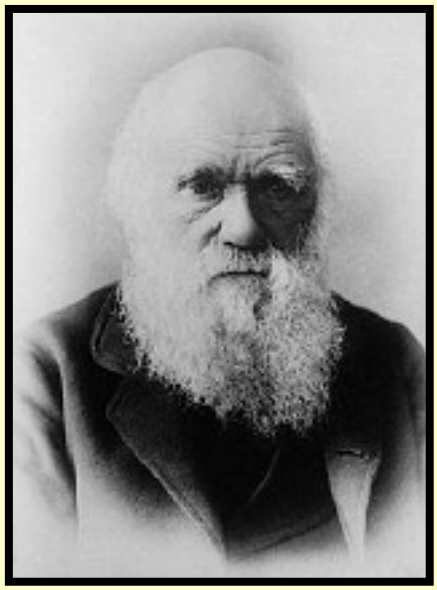
The DNA molecule in all of its majestic complexity was not known. Darwin posited a simple mechanism for one species evolving into off-shoot species. This is called "speciation," a process in which a certain species spreads out over two or more geographic areas and then adapts to the changes in each geographic area with new features, perhaps a new beak or tail. Each population diverges from the other to the extent that the populations of each species in those geographic areas are unable to reproduce with those in the other regions. They then become new species by simple fact of their inability to reproduce across population barriers.

To reiterate, Darwin proposed a very simple model for how this process worked, one that presumed long periods of geological time in which speciation could occur. The original species spreads out in to different populations that find themselves in new environments. For instance, let's say that one new environment is a forest and the other is savannah. Each will become a new species diverging from the other by simple mechanisms of selection. The forest population has to adapt to the forest in such a way that those most able to make that adaptation, possibly by climbing trees, will survive and produce more offspring. Those not able to adapt will not survive as long and be unable to have as many offspring. Natural selection is the sad but ever-present means by which Nature culls the herd of those in the forest unable to adapt, or else it is the method by which she drives them

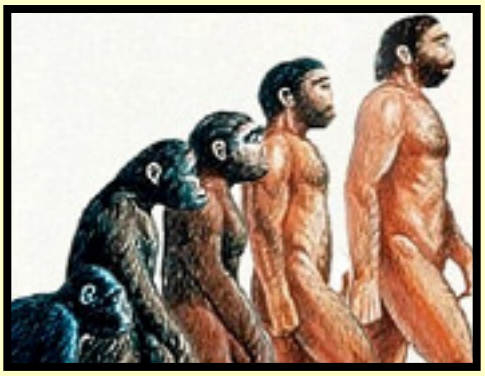
Cosmic Rays & Evolution *(Continued from previous page)*

to the savannah population in which they will survive, adding their traits to the emerging new species in the savannah. In addition to natural selection, sexual selection is the means by which forest region mating partners are chosen on the basis of either their fitness in that new environment, or else random qualities that are particular to that population and which then further differentiate them from the savannah population, which develops a different culture based on both natural and sexual selection. Over a period of millions of years, each population differentiates itself to such an extent that we have two new species, unable to sexually reproduce across species lines.

Darwinian evolution revolutionized not only the biological world, but western thought itself.



It has had its critics from religious corners, and also from corners of the left of the political spectrum who fear that idea of a natural order seemingly based on competition. Remember, however, that while competition may be Nature's method of selecting, the traits that are selected are not necessarily competitive. Cooperation, mutualism, and love between members of a social group can also be selected. Darwin's theory simply posited genetic drift within a population, leading to differentiation. The attempt to make his theory an excuse for oppressing the poor and sterilizing the "unfit" had nothing to do with the science itself. And yet, some aspects of Darwin's thinking have been superceded by modern science. Darwin himself had no knowledge of later models of genetics, or of how genetic drift actually works. His theory assumed that changes in life were gradual and not cataclysmic. Darwin himself struggled hard to explain key periods of rapid change in the evolutionary trees, in particular the dramatic events of the Cambrian Explosion.



Eventually the idea of "mutations" became part of the accepted scientific understanding of how genetic change generates the diversity in a species necessary for speciation.

During the twentieth century, it was found that radiation can influence mutation, perhaps even "helpful" mutations that might potentially have helped evolution along certain lines. Some of that radiation might have come from cosmic rays from various local astronomical events, including perhaps supernovae.

I want to sound a warning. Radiation is not good for you. It will not help your evolution! Quite the contrary, most mutations are harmful. The mutations caused by human made radiation will be overwhelmingly harmful, in large part given the fact that we interact with radioactive substances that have a very long half-life. The government and nuclear industry can try as they might, but I am always skeptical when someone says that radiation will help me. I also want to sound another note of caution, lest I misstate the argument of Doctor Svensmark. Doctor Svensmark is not suggesting that cosmic rays altered the genome to promote evolution. That is not his model. He is proposing that cosmic rays from local supernovae affected the climate of the planet, which in turn allowed for cataclysmic evolutionary changes. Indeed, I admit to some skepticism about Dr. Svensmark's model along a number of fronts. Firstly, radical

Cosmic Rays & Evolution *(Continued from previous page)*

climactic change is a result of a number of factors. In particular, the way the climate changes is almost never subject to one input. Cosmic rays may be one input source, but so are terrestrial factors such as volcanoes and other extraterrestrial factors such as asteroids. Even Doctor Svensmark admits that plate tectonics can influence evolution. Having not studied his model in depth, having no right to dismiss his evidence without deeper consideration, I admit to skepticism about any simple model of how evolution works.

At the same time, I also admit to a fascination with the possibility that extraterrestrial influences might have changed the evolution of life.

The extinction of the dinosaurs was almost certainly caused by an asteroid. In my opinion, cosmic rays cannot be dismissed as an influence on Earth, or solar flares for that matter. Extraterrestrial radiation can affect the climate by altering levels of condensation and precipitation. Cosmic rays might also affect the rates of mutation. Increased rates of mutation will increase the diversity within a species that might allow for flexibility in speciation. Again, to repeat, mutations are harmful in the overwhelming majority of cases, certainly those caused by the high levels of radiation that humans have been releasing in to our environment. An astronomically small number, however, are helpful. I am frankly intrigued by the possibility that

cosmic rays could affect the genome, allowing for genetic variability and possibly increased adaptability. Most mutations will die off. A small number will survive, or even thrive. As environmental conditions change, those mutations might be helpful in adapting. It might be that in times of great evolutionary change, helpful mutations played a key role in the rapid change of life itself. The idea sounds far-fetched to orthodox biologists who might scoff at this notion, but unless there is an overwhelmingly compelling reason to rule it out I think it should be considered. Extraordinary claims may require extraordinary evidence, but the claim itself needs to be taken seriously before that evidence can be fairly weighed.

I want to explore one last concept, before biological orthodoxy takes a hook and drags me off the stage for having upset the neo-Darwinian model too badly with my admittedly rather non-mainstream speculations. The concept of "mutation bias" needs to be defined. I will do my best to address mutation bias as a layman who admits that he is not a biologist.

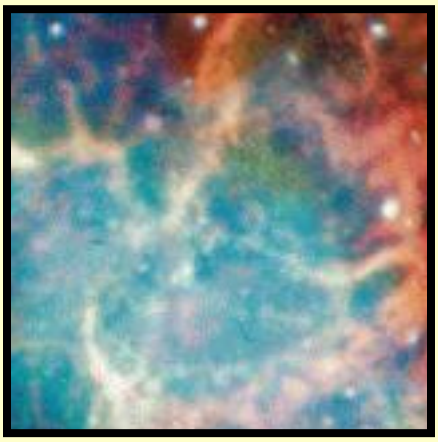
Mutations can be defined as random on one level, but the direction of a mutation is constrained by various factors that exist on the molecular level.

The genome will mutate, but only in ways consistent with the structure of the DNA molecule itself. The loss of pigments of animals that adapted to caves may be an example of a bias mutation that in which pigment is lost if it is not necessary. If this scenario is correct, there is an inherent bias toward the loss of pigments that we do not see if we are exposed

to the sun, but which we would see if we lived underground. I humbly propose scientists deeply examine the question of whether or not cosmic rays might affect how mutation bias occurs. Indeed, cosmic rays affect genetics on the molecular level. If small

Cosmic Rays & Evolution *(Continued from previous page)*

amounts of cosmic radiation could change mutation bias, those changes would have an effect on the evolution of life. They may not be enough to fully explain such events as the Cambrian Explosion or other rapid periods of change,



but if those times of change do end up correlating to astronomical events, as Doctor Svensmark suggests, then we have a mystery that needs to be explored, including explanations that might diverge from the climate-based model he proposes.

While none of this is conclusive, I leave my reader with one last bit of information that is interesting. Apparently, according to recent NASA observations from the IBEX, the sun is moving through the Milky Way much more slowly than was expected. (LA Times, May 11, 2012. "Sun Moving Slower than Expected—And Without Bow Shock" by Thomas H. Maugh II) This means that the sun does not have the bow shock that helps shield the Solar System from radiation like scientists once thought it would. If the sun passes through an interstellar gas cloud, then radiation can enter the Solar System and yes, even the article admits, potentially influence the evolution of life on Earth. Any mutations caused by local supernovae would still have to be favored by conditions on Earth, but with enough flexibility life on Earth could absorb non-lethal levels of radiation and turn hostile radiation in to genetic flexibility.

I am still not going to trust human created radiation to "help my evolution," because of the fact that radiated materials are dangerous when in our soil and water. This would be detrimental to all life on Earth. But, when I look up at the stars and wonder about whether nearby stars will nova, or if radiation comes down from the heavens, I will be less afraid than I am philosophical.

In that scenario, if I go, at least life on Earth might have a fighting chance, leaving my place in the Universe remembered.

Nathaniel Bates

Annular Eclipse Captured by Mike Harms

Taken in Redding California

Ring of Fire over Turtle Bay in Redding California, May 20, 2012.

Mount Diablo Astronomical Society Event Calendar–June 2012

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
27	28	29	30	31	1	2 Observatory Maintenance Sunset: 8:27 PM
3	4	5 5 events: Click here to view	6	7	8	9 Sunset: 8:31 PM
10	11 7:30 PM Board Meeting	12 7:00 PM MDAS Imaging SIG	13	14	15	16 8:00 PM Society Observing 8:30 PM Round Hill CC Campout Sunset: 8:34 PM
17	18	19	20	21	22 Yosemite Weekend SETICon	23 3 events: Click here to view Sunset: 8:36 PM
SETICon 24	25	26 7:15 PM GenMtg: Dark Energy	27	28	29	30 8:30 PM Fernandez Ranch Stargazin Sunset: 8:35 PM

Annular Eclipse Captured by Ellis Myers

Taken from Moraga, California

Letter to the Editor

Thank you for taking my letter. I am responding to "Why Humanity May Have to Leave the Solar System Sooner Than You Think!" by Mr. John Read. (May 2012 newsletter). The article certainly was panoramic, and a good narrative for one possible future. I will admit that what is today science fiction often becomes tomorrow's science fact. In turn, it then becomes the next day's cultural "kitsch." I will not dispute that the scenario Mr. Read has proposed is one possible future, albeit I retain some skepticism about the idea of "mining the sun" in any way other than using solar panels or even a Dyson Sphere, which would not deplete the sun. I am certainly open to being corrected on that front, or if Mr. Read would like to explain how the mechanics of mining the sun would work. Certainly, I agree with him that if we did expand outward we would have to mine asteroids and planets. In any case, the idea he proposes of humanity becoming a galactic species and interacting with friendly life forms is one that inspires the mind of the young at heart of any age.

Mr. Read is certainly a technological optimist. He reckons that we will conquer the incredible distances of the stars, a hopeful belief that is often disputed by the skeptical camp among the scientists. What I would say is that I would hope that if we are that advanced that we can expand across the galaxy, that if the skeptics are wrong, then we would also be advanced enough not to destroy our own home planet or to overpopulate it as Mr. Read seems to suggest we will. I would hope for a future with wild places for people and animals to enjoy without high rises. I am the last person to be a skeptical Malthusian, but I am also the last person to want a planet of concrete and homogeneity. If we do expand in to space, I hope it is because we are fulfilling the great commission of Life to propagate and make living the lifeless spaces, not because we failed in that commission and made dead the planet that bore us.

With due respect, we might be better put to utilize our resources to solve global problems here on Earth before putting them to cosmic ventures of the nature that rest on ever expanding frontiers among the vast distances of the stars and very little to sustain us between them. If we can solve those problems and advance in wisdom as well as merely technological prowess, perhaps someday we might be suited to become cosmic citizens and take our place among the council of enlightened planets. Someday, perhaps, but I am doubtful that it is today.

Nathaniel Bates

Annular Eclipse Captured by Vianney

My pictures of the annular eclipse are not specially dramatic nor impressive using a relatively old pocket digital camera!

But what is impressive is having witnessed this superb phenomenon from the bottom of the Grand Canyon. It was at its maximum just like in Northern California.

During the event the light was surreal, very theatrical, where everything is already surreal without any special effects from Mother Nature.

Not only was the trip a "Trip of a Lifetime" but the experience of witnessing this eclipse in such

I was rafting the Colorado river through of course the Grand Canyon National Park in 16 days, and was not sure that I could witness it due to the high canyon walls.

Late afternoon of May 20th we camped where on one side the walls were vertical. So six of us crossed the river with the only paddle boat in our expedition and climbed the banks high enough so we could have a good view of the sun, fortunately the river was facing almost due West which of course was very helpful.

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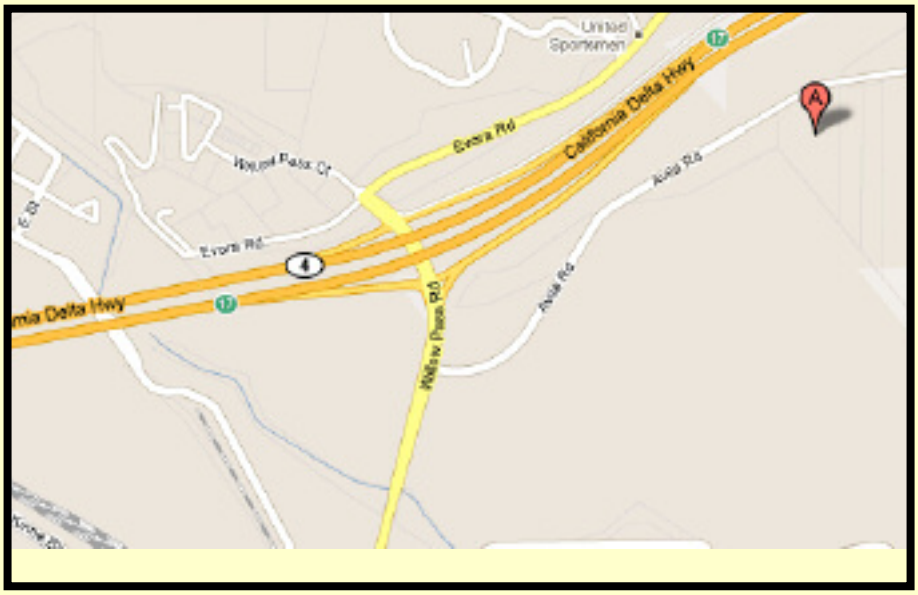
General Meetings:
Fourth Tuesday every month, except on the third Tuesday in November and December. Refreshments and conversations Meetings begin at 7:15pm.

Where:
Concord Police Association
5060 Avila Road, Concord, CA 94596-3754

Directions to facility:
Avila Road is off Willow Pass Road. Turn east onto Avila Road approximately 300 yards south of the Willow Pass Road off-ramp from the Route 4 freeway. Turn right into the Police Association Facility at the crest of the first hill.



Your Help Is Always Greatly Appreciated

Our association needs a few members to come at 6:30 p.m. before our monthly meeting which starts at 7:15 p.m. to help in seting up the chairs and other elements needed to conduct the general meeting.

Similarly at the end of each meeting the chairs and tables have to be removed, the room has to be cleaned and the garbage emptied.

Thank you for your help.