



# Desert Sky Observer

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NEWSLETTER OF THE ANTELOPE VALLEY ASTRONOMY CLUB, INC  
P.O. BOX 4595, LANCASTER, CALIFORNIA 93539-4595  
*The Antelope Valley Astronomy Club, Inc., is a 501(c)(3) Non-Profit Corporation.  
Visit the Antelope Valley Astronomy Club website at [www.avastronomyclub.org/](http://www.avastronomyclub.org/) The  
A.V.A.C. is a Sustaining Member of The Astronomical League and the International  
Darksky Association.*



## Up-Coming Events

- January 3:** Last Quarter Moon  
**January 8:** Optic Cleaning "Party,"  
10am., Terry Pedroza's house  
**January 8:** Dark Star Party, [Saddleback](#)  
**January 10:** New Moon  
**January 14:** **Monthly Club Meeting\***  
**January 17:** First Quarter Moon  
**January 23:** Full Moon

\* Monthly meetings are held at the S.A.G.E. Planetarium at the Cactus School in Palmdale on the second Friday of each month. The meeting location is at the northeast corner of Avenue R and 20<sup>th</sup> Street East. Meetings start at 7 p.m. and are open to the public. Please note that food and drink are not allowed in the planetarium



**Club  
President Debora  
Pedroza**

The New Year is here and I hope all of you had a joyous and safe holiday. I am so excited to start off my new year as the new AVAC President. I have always been immensely proud to be a part of this club and I am grateful for this opportunity. I have a few goals that I would like to share, but first I would like to thank the Board of 2004 for their hard work and dedication. Special thanks are extended to Terry Babineaux, Doug Drake, Tom Koonce, Larry Oschner and Michael Roberson. When club members step up to the plate to volunteer their time and talents, our club stays strong. I would like to acknowledge and welcome the Board for 2005: Vice President Mindy Peterson, Treasurer David Abrass, Secretary Larry Oschner and Director of Community Development Terry Pedroza. Congratulations to each of you!

Our club has really excelled in our community development area as we continue to outreach our love of astronomy to others. Increasing and maintaining our club membership is an area I feel most passionate about. I would like to set up a membership committee to help target this goal. Some of the committee's tasks will involve the welcome of new members with "thank you" letters, care calls to meeting absentees, awards and recognition, class scheduling, and star parties and event planning. I would like to see the club increase its list of sponsors and establish a new observing site which we can truly call our own. The club does such an awesome job in fulfilling our community goals and I would like to see that same focus and energy being put into increasing the number of observing events and in joining observing groups (i.e., the Messier Group or the Lunar Group, etc.). We all love astronomy and together we can make this happen.

Volunteers are needed to get the membership committee moving into high gear. Everyone has something they can offer to help keep our membership strong. If you are interested, please e-mail me or talk to me at the next club meeting. Until then...take good care.



*Vice  
President  
Mindy  
Peterson*

First, I would like to say that I am very excited to be on the Board for the first time and to be the new Vice President of this wonderful Club. I will be bringing to the plate new speakers and a few recurring speakers with fresh and exciting topics. The January meeting brings back an old friend with a new topic. We are welcoming Dr. Gary Peterson from San Diego State University. His topic is entitled "Collision Of Comets And Planets," and he has assured me that this will be of interest to all. Dr. Peterson has always been an interesting and enlightening speaker. I am currently in contact with a person from NASA who has several wonderful speakers that we are lining up for the coming months. So, won't you join us at the January meeting to see what Dr. Peterson has in store for us?

2004 seemed to always bring us clouds, rain or just downright nasty weather during the dark of the moon. Let's hope that 2005 brings us more cooperative weather for our monthly Star Parties. I would encourage everyone, especially our new members, to come out for our Star Parties. It's a great chance to meet other Club members and learn more about the night sky. Our Star Party for January will be held at Saddleback Butte, which affords the observer a dark sky with only a short drive from town. I hope to see you all at Saddleback on January 8<sup>th</sup>.



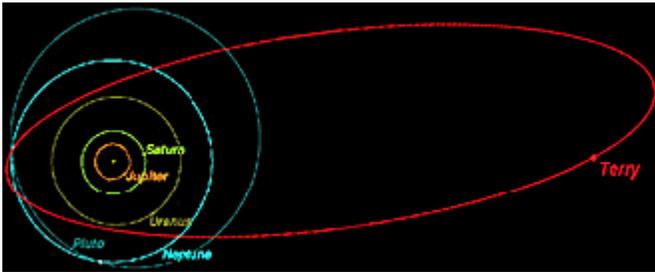
*Director of  
Community  
Development  
Terry Pedroza*

Well, another new year is upon us. I think that **WE** can make this the best year that the Antelope Valley Astronomy Club has ever had. The 2004 Executive Board did a great job and has left us with big shoes to fill, but we are up to the task. Thank you Terry, Doug, Tom, Larry and Michael for all of your hard work and the strides that your Board made in 2004.

I am hoping to add many new members to the core group that we have and increase participation at our many public events so that we don't burn anybody out this year. I will be putting a limit on the number of events that we do and I am hoping to have more member-only type events this year. I will be asking for **YOUR** input on what you feel our club should be doing for the community and for our members.

We have already been asked to do several events in 2005 and I am sure that we will have many more requests. As these events come up I will be asking for your help manning them. I will always try to give at least one month's notice so that you have time to plan for these events. Thank you all in advance for the help the I am sure the club will be receiving from you: our members, in 2005.

## The Eccentric Orbit



of Terry Babineaux

I recently ran across a junior high school yearbook that I hadn't seen in many years. Especially fun were the remarks made by the science teacher who used to run the school's fledgling astronomy club (and to whose credit it is that my love of amateur astronomy continues to this day). Found also amongst the scrawlings were some comments from one of the school's football stars. To him, I was a "brain," an "idiot" and a "pentode." This last remark must have been an additional insult whose meaning is long lost in the vault of time- the inner workings of a vacuum tube would have escaped most of the football players I knew at the time. Nor can I reconcile how I can be both an "idiot" and a "brain" simultaneously (no one ever accused, then or now, your typical budding teenager of making any sort of sense).

It is fun to reminisce about things that happened a long time ago. But what exactly is this thing we call time? Most of us have little difficulty realizing that the view we have of the night sky is actually a glimpse into the past, ranging from a few minutes to many millions of years ago. But time is often referred to as the fourth dimension, at which point things start getting confusing. Time, too, is "relative." So what can something as commonplace as an old yearbook tell us about time?

If I could somehow jump thirty light years or so from the planet Earth and if I had the right equipment, I could witness the football player calling me a "pentode" and I might then be able to figure out what he was talking about. Thinking of time in this way gives it a geometrical aspect which makes a fourth dimension easier to comprehend. As walking the perimeter of a house gives different views of its walls, getting closer or farther from an event gives different views of things that transpired during that event.

But what if I stay in that same spot? I will see many successive yearbooks pass by. In other words, I will move into the future relative to where I am standing. If I move outward at the speed of light, my view into the past will freeze. If I exceed the speed of light, my view will play backwards! This changing nature of my view as it depends on speed is an example of what is meant by "relativity."

As intriguing as this may sound, the mathematics governing such things involve incomprehensibles such as infinite mass, division by zero, and square roots of negative numbers. But I can't help but wonder if the human mind will ever evolve to the point where such things are solvable, and if it does, would true time travel then be possible?

But now I'm starting to sound like that nonsensical football player. Light, as many of us are aware, is made simultaneously of particles and waves with conflicting properties. Likewise, time is made up of different dimensions muddled by relativity. The universe is indeed full of strange things. It would be no shock if the football player who could somehow consider me both a "brain" and an "idiot" turned out to have brainpower sufficient to comprehend such conflicts and is now a word class astrophysicist.

## ***\$\$ FOR SALE \$\$***

Televue Pronto OTA with case, 2-inch diagonal, clamshell ring and 20mm eyepiece; \$650.00;

Thousand Oaks < .9 angstrom H-Alpha solar filter to fit Televue pronto; \$450.00;

Will sell as package for \$1050.00. For more info contact Terry @ [reslatuo@verizon.net](mailto:reslatuo@verizon.net) or call (661) 718-3963 after 5:00 pm.

My 16-year-old daughter, Sara, is trying to earn her sponsorship monies for upcoming scholarship pageants that she is competing in. In order to help her out I am breaking down and selling my ETX Astro Telescope. It comes with the table tripod, ETX carry bag, field tripod and 2X Barlow lens. It is about 6 years old and in extremely excellent condition. I am hoping to sell it for at least \$350, but am desperate to help my daughter as sponsorships have been few and far between, so I may be forced to let it go for less.

We live in Lancaster and my phone number is 726-9042. Kimberly Miller

## *Astrophoto of the Month*

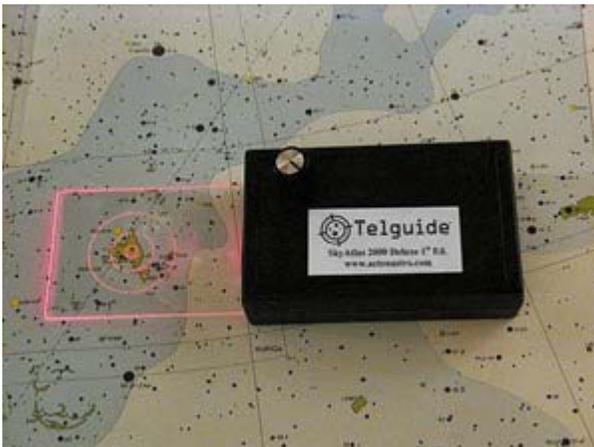


by Rich Harper; M42, taken with a 70mm Ranger, Ilford HP5+ film, 10 minute exposure.

Submit your "Astrophoto of the Month" to the following address by the 20th of each month:  
[newsletter@avastronomyclub.org](mailto:newsletter@avastronomyclub.org)



Connect with QNet  
an **AVAC** sponsor



### The *Telguide*.

Our own Steve Trotta has invented the Telguide to aid you in your galactic hunts. For more information on how a Telguide can help you, [click here](#).

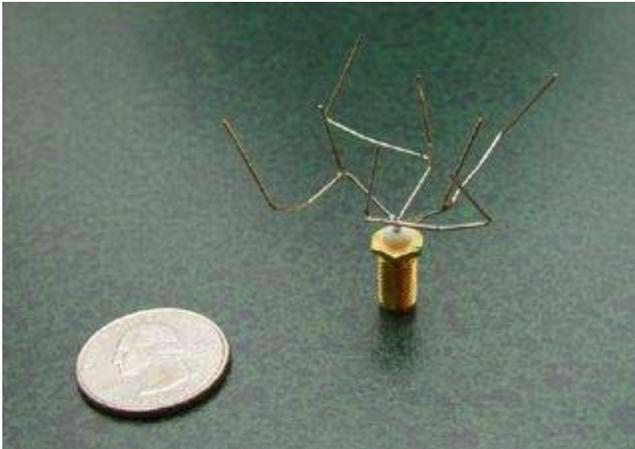


## Antennas, Designed by Darwin

by Patrick L. Barry

Who in their right mind would design this bizarre-looking antenna? Actually, nobody did. It *evolved*.

Taking a cue from nature, NASA engineers used a kind of "artificial evolution" to find this design. The result may look odd, but it works very well.



"The evolutionary process improves the design of antennas, just as evolution in nature leads to fitter plants and animals," says Jason Lohn, leader of the Evolvable Systems Group at NASA's Ames Research Center.

The improvement comes from Darwin's idea of natural selection: only the fittest members of a generation survive to produce offspring. Over many generations, traits that hinder survival are weeded out, while beneficial traits become more common. "In the end," he says, "you have the design equivalent of a shark, honed over countless generations to be well adapted to its environment and tasks."

Evolutionary computation, as it's called, applies this principle to hardware design. It's particularly useful for tackling problems that are difficult to solve by hand- like the design of new antennas.

Designing a new antenna for NASA's Space Technology 5 (ST-5) mission was the challenge facing Lohn's group. ST-5 will explore how TV-sized "nano-satellites" can perform the tasks of much larger, conventional satellites at a cheaper cost. Antennas on these satellites must be smaller than usual, yet capable of doing everything that a bigger antenna can do.

The evolution of this bizarre-looking antenna happened inside a computer. Many random designs were tested in a computer simulation. The computer judged their performance against certain goals for the design: efficiency, a narrow or wide broadcast angle, frequency range, and so on.

As in nature, only the best performers were kept, and these served as parents of a new generation. To make the new generation, the traits of the best designs were randomly mixed by the computer to produce fresh, new designs- just as a father and mother's genes are mixed to make unique children. This new generation was again tested in the computer simulation, and the best designs became the parents of yet another generation.

This process was repeated thousands, millions of times, until it settled onto an optimal, shark-like design that wouldn't improve any further. With today's fast computers, millions of generations can be simulated in only a day or so.

The result: an excellent antenna with an odd shape no human would, or could, design.

For more about artificial evolution, see <http://ic.arc.nasa.gov/story.php?sid=86&sec>. For more about Space Technology 5, see <http://nmp.nasa.gov/st5>. For an animation that helps explain to kids how ST5's antenna sends pictures through space, go to <http://spaceplace.nasa.gov/en/kids/st5xband/st5xband.shtml>

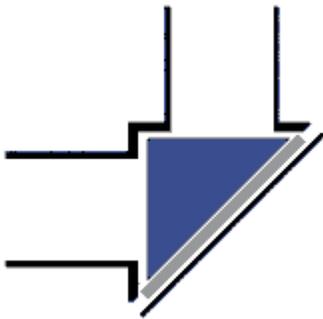
*This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.*



## The Humble Prism Diagonal

by Rich Harper

Many of you probably have an inexpensive prism diagonal that came with your scope. A schematic of a typical prism diagonal is shown below, with the housing in black, the prism itself in blue, a back-plate also in black, and a piece of foam, in gray, which keeps the prism seated in the housing. As you can see, this is very simple construction. Light from the telescope enters from the left, reflects off the hypotenuse of the prism, and exits at the top.



Prisms have several disadvantages and advantages compared to mirror diagonals. First, they tend to suffer from a number of “defects” which tend to cause them to be held in low regard. Fortunately, these defects are easily remedied. Second, they have three surfaces to keep clean, though this shouldn't really be a problem if properly stored and cared for. Third, they tend to introduce chromatic aberration and other optical aberrations in telescopes with focal ratios of less than f-9. If you have a Schmidt-Cassegrain, long-focus refractor, or a Maksutov-Cassegrain, they are ideal, but they will suffer on faster scopes.

As far as advantages go, there are several. First, unlike standard mirrors, properly constructed prism diagonals suffer from virtually no light scatter. Second, they are inexpensive, especially compared to high-end dielectric mirror diagonals. Third, they are self-collimating. Because of the refractive nature of a prism, as long as the faces are true, slight errors in collimation are cancelled out, and the light-path is bent exactly 90 degrees. With a mirror, the mirror must be at exactly 45 degrees to bend the light-path 90 degrees. Fourth, prisms don't suffer from oxidation after a few years, unlike conventional mirrors, and can maintain their full reflectivity, typically 98%, indefinitely.

The first thing to do is examine the prism. Many have a back-plate that is screwed into a plastic or aluminum housing. By removing these screws, we can remove the back-plate, the foam spacer, and the prism. The screws are small, so put them in some sort of container to keep them from running off while you work. I recommend handling the prism with a clean tissue or soft, clean cloth. It is not likely that you will scratch the prism or its coatings, but you also don't want it covered in fingerprints. I have disassembled and examined three prism diagonals from major manufacturers, and all suffered from various defects. Namely, they all lacked blackened edges, two lacked proper flocking, and one used a piece of Styrofoam instead of foam to keep the prism seated. Eyepieces have blackened lens edges, so the prism should as well. Flocking is important to keep light scatter inside the housing to a minimum, and in the prism with the Styrofoam, it had become compressed over time, and failed to hold the prism in the housing properly. Minor collimation errors are okay, but our prisms shouldn't rattle when shaken.

The prism has five surfaces or faces. The two roughly square entry and exit faces, the rectangular reflective face of the hypotenuse, and the two triangular side faces. The entry, exit and hypotenuse are all coated, and have a polished finish. The triangular sides, shown as blue in the schematic above, are rough, having what looks like a sand-blasted or rough-cut finish. These should carefully be painted with a flat-black paint to prevent light scatter and to improve contrast. The paint should be allowed to dry quite thoroughly, at least overnight.

When the diagonal is reassembled, the entry and exit faces are interchangeable when the prism is placed back in the housing. After the prism is installed, the hypotenuse should be covered with a piece of black flocking paper to prevent off-axis light from reflecting off the spacer foam. Foam, even black foam, still suffers from significant specular reflection due to its porous nature (ask me how I know!). Next, a piece of foam, slightly thicker than necessary so it will be compressed and hold the prism in place, is placed over the prism and flocking paper. Then the back is reinstalled. With everything done, you should have a prism diagonal that will rival a much more expensive dielectric unit in your long focal-ratio scope.

***Did you know? ? ?***

Comet Machholz, now near Orion, will be visible until late February. Its brightness should peak the first week of January.

? ? ?

**A.V.A.C. Board Members****President:**

Debora Pedroza (661) 718-3963 [president@avastronomyclub.org](mailto:president@avastronomyclub.org)

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**Secretary:**

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**Astronomical League & Club Historian:**

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**Webmaster of Club Site:**

Steve Trotta (661) 269-5428 [webmaster@avastronomyclub.org](mailto:webmaster@avastronomyclub.org)

**Our Sponsors**

**Al's Vacuum and Sewing:** 904 West Lancaster Blvd. (661) 948-1521. Stop by and say "hey" to Matt and Sue and run from Michael.

**QNET:** 1529 E. Palmdale Blvd., Suite 200. (661) 538-2028. As an Internet provider, they are kind enough to provide us with a free website.

**High Desert Broadcasting:** General Manager, Vicky Connors (661) 947-3107; They assist us in advertising our Club.

**Woodland Hills Camera:** 5348 Topanga Canyon Blvd., Woodland Hills. 888-427-8766. [www.telescopes.net](http://www.telescopes.net)

**Thank you to our sponsors for your generous support!**

**A.V.A.C. Membership Information**

Membership in the Antelope Valley Astronomy Club is open to any individual.

The Club has three categories of membership.

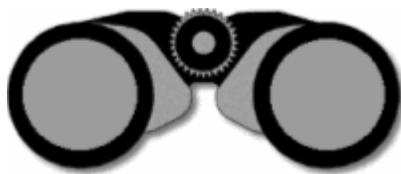
- Family membership at \$30.00 per year.
- Individual membership at \$25.00 per year.
- Junior membership at \$15.00 per year.

Membership entitles you to...

- Desert Sky Observer—monthly newsletter.
- The Reflector—the quarterly publication of the Astronomical League.
- The A.V.A.C. Membership Manual.
- To borrow club telescopes, binoculars, camera, books, videos and other items.

The Desert Sky Observer is available as a separate publication to individuals at a cost of \$10.00 per year. Subscription to the Desert Sky Observer does not entitle the subscriber to membership in the Antelope Valley Astronomy Club and its associated privileges.

## *A Look Ahead...*



### Upcoming Star Parties

- February 5     [Crystalair](#) (Tentative)
- March 11     Dark Star Party- Messier Marathon,  
[Saddleback Butte State Park](#)

### *Astronomy Links on the Web*

<http://www.astropaws.com>

(Terry Babineaux's astrophotos)

<http://www.actonastro.com/>

(Steve Trotta's website)

<http://www.noexitrecords.com/zerobox/astro.htm>

(Tom Varden's website)

<http://www.astro-tom.com/>

(Tom Koonce's website)

<http://saturn.jpl.nasa.gov/multimedia/images/latest/index.cfm>

(the latest Saturn pics from Cassini)

<http://www.astroleague.org/>

(The Astronomical League site)

<http://antwrp.gsfc.nasa.gov/apod/archivepix.html>

(Pic of the Day)

[www.avastronomyclub.org/](http://www.avastronomyclub.org/)

(that be us)

\* \* \* \* \*

### Christmas Party Photos



Congratulations to “Keith Lawson Award” winner Steve Trotta. Steve won the annual award for his hard work on our website. Thanks to Steve, the site not only looks great, but it is practical and now includes a message board.













