CACHE VALLEY
# CLEAR SKIES

CACHE VALLEY ASTRONOMICAL SOCIETY cvas-utahskies.org

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## PRESIDENT'S CORNER

**Dale Hooper**

We are looking forward to a great meeting on Friday, November 15th. We are planning on two presentations from our members. Dean Louviere will be speaking to us about Introductory Astrophotography. In addition, Tom Westre will be speaking to us about the Celestron Origin which is a really interesting new smart telescope. So, if you have thoughts about starting into astrophotography or could use some pointers on how to get going or are interested in the latest smart telescope offerings, this meeting should help you out.

As I am writing this message (mid-October), comet C/2023 A3 Tsuchinshan-ATLAS is making a real hit. It is always fun when we have a nice comet in the sky. It is getting higher in the evening sky each night. I would guesstimate that it is currently about magnitude 3 so it is visible with the unaided eye, but may have faded by the time you read this. It will be in Ophiucus until November 10th when it will move into Serpens Cauda. It then moves into Aquila on November 24th where it will be during the remainer of 2024. I expect that we will have several nice pictures of the comet in this newsletter for you to enjoy. We've also had many wonderful comet images show up in our groups.io email list. Enjoy this comet while you can, it won't be back for a very long time.

You may recall in my last message that I mentioned that I had acquired a camera that was specific to observing occultations of stars by minor planets. On October 7th I was able to get my first positive occultation using this camera. I was able to observe an occultation by asteroid (688) Melanie of magnitude 10.7 UCAC4 380-159953! I got to see the star blip off for just over 5 seconds and then blip back on. You can see the light curve graph below. This asteroid is rather interesting because it is known as a "slow rotator" since it takes about 19 hours to rotate once. Dr. Anna Marciniak, a professional astronomer is specifically studying these slow rotating asteroids. So, it was fun to send her my observation information and then receive a thank you email in reply. As I mentioned last month, there are SO MANY things that we can do as amateur astronomers. Follow your heart.

## Executive Committee

- President: Dale Hooper dchooper5@gmail.com
- Vice President: Randy Jost rjost3@comcast.net
- Secretary: TBD
- Newsletter: Dean Louviere deanlouviere@gmail.com
- Membership Coordinator: Dell Vance: avteam.dell@gmail.com
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- Webmaster: Josh Kirk me@joshkirk.com
- NASA Night Sky Network Coordinator: Dell Vance avteam.dell@gmail.com

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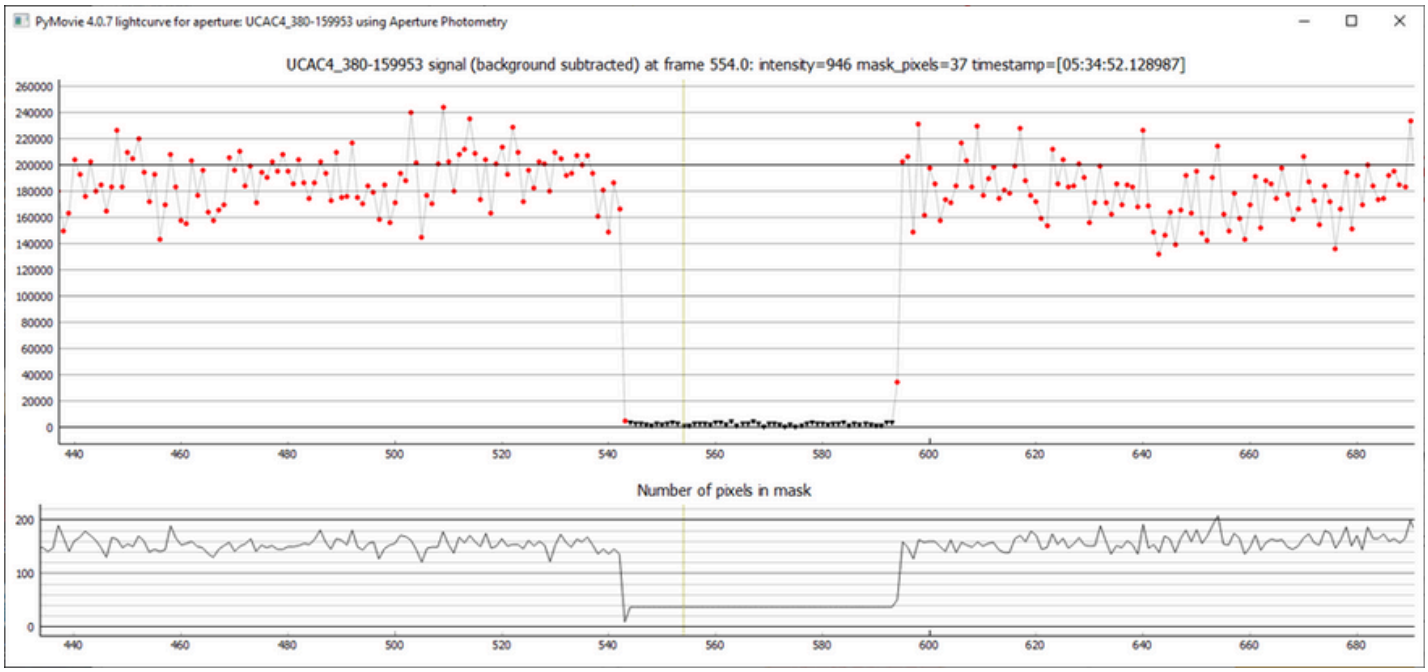
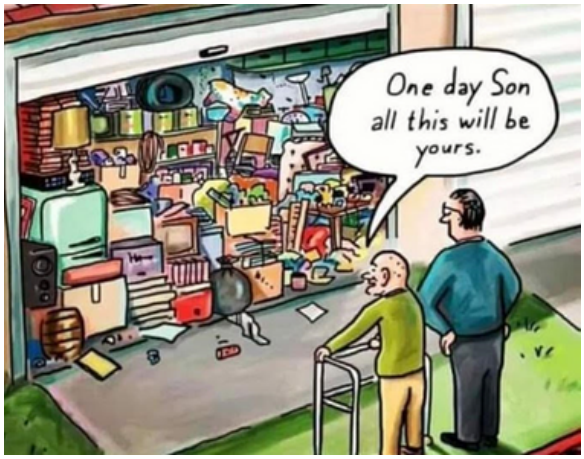



*Light Curve for Occultation of UCAC4 380-159953 by (688) Melanie – Location: C.M. Hooper Memorial Observatory*




However, at this point in my life, every time I make a significant astronomy purchase my wife says, "I hope you live a long time". I kind of see her point, I always picture my astronomy gear as very valuable, but I suspect my kids picture it more like the cartoon below.

I'm writing this early because next week I will be taking a trip that will include the Southern Hemisphere for the first time in my life! Of course, I'll be taking my SeeStar along, so I hope that for the December newsletter, I'll be able to include a few treats from the southern skies.

Spring and Fall are my favorite times of year to observe because it isn't too cold yet, it gets darker a lot earlier and the sky is usually fairly clear. Be sure to take advantage of the crisp and clear fall nights, because when we reach February, we only average about two or three clear nights during the entire month – and they seem to happen when there is a full moon. That is why I developed in interest in radio astronomy since I don't have a cloud filter for my regular telescopes. Clear skies, Dale.

## Club Meetings

November 15th
Room 107 of the Engineering Lab Building on the USU Campus at 7pm

- 3rd Friday of the month

## Star Parties

- November 1st 6:30

Little Bear River Retreat
878 Baxter Hollow,
Paradise, UT.

## STEM Nights

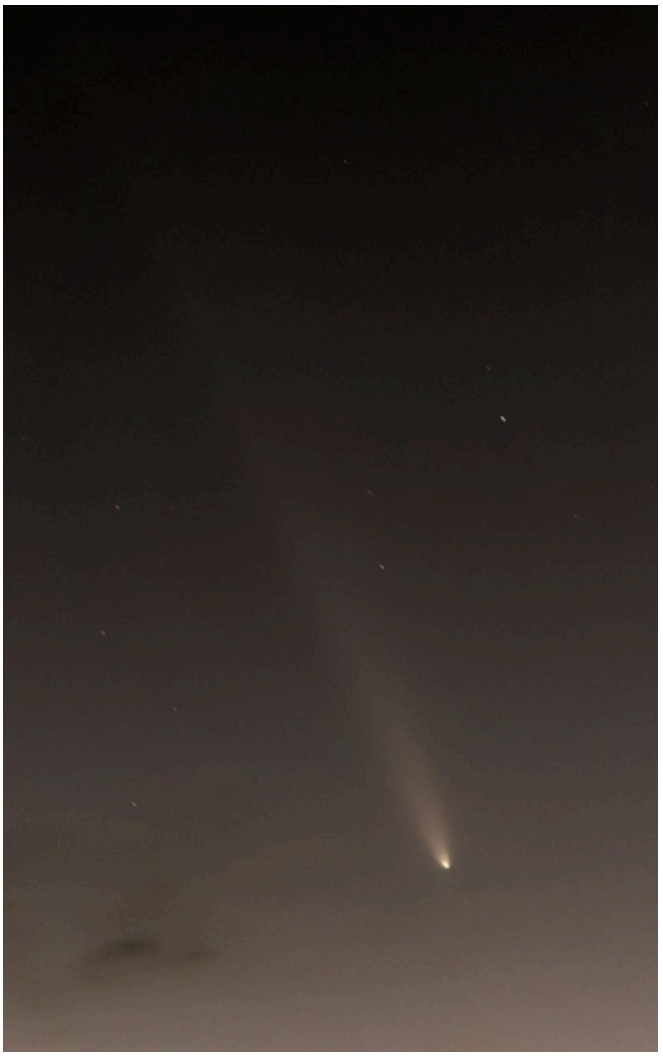
- North Park Elementary Jan. 9th
- Wellsville Elementary Jan. 22th
- Canyon Elementary Feb. 6th
- Cedar Ridge Elementary March 13th
- Sunrise Elementary March 18th
- Greenville Elementary March 24th

## October Observations

by Blaine Dickey

We have been delighted in October to see an unusually bright comet gracing our western sky. The image below of Comet C2023 A3 (Tsuchinshan-ATLAS) came from my second attempt to see the comet. The first night mostly obscured the comet with clouds. A definite anti-tail is clearly seen extending below the bright core of the comet.


My son Scott caught the comet before it was obscured by clouds on the 13th of October from Sandy, Utah. His image is close to how the comet appeared to the unaided eye and binoculars.



The third image shows how the comet looked last summer on June 24, 2024. The magnification of this image is the same as the first image showing how much closer the comet was in October as compared to last June.

Messier 33 is a part of the local group of galaxies, including our Milky Way and Messier 31, the Great Andromeda Galaxy. It lies a little further away than Messier 31 at a distance of about 3 million light years. This spiral galaxy is also known as the Triangulum galaxy because of the constellation it resides in. This galaxy is about half the diameter of the Milky Way coming in at about 60,000 light years. To the unaided eye it is quite dim but can be seen with a pair of binoculars under dark skies.

Barnard's star is shown in the next image. It was something I have been wanting to image for a long time. It is the 2nd closest star to Earth at 5.9 light years away, and moves rapidly 10.5" per year. At that rate it would move the distance of half way across the moon in a person's lifetime. It is a red dwarf star moving towards earth and will only be 3.8 light-years in about 10,000 years. It was recently confirmed that Barnard's star has at least one planet.


There seems to be no end of the adventures that await the diligent star gazer. October was a good month to look upward.

## Journey to the Stars

Welcome to a new section of our newsletter! We'd love to hear about your journey to the stars. What sparked your interest in astronomy? Was it inspired by a family member, or maybe a captivating photo? When did you get your first binoculars or telescope, and what are your goals for this year?

Feel free to share as much or as little as you'd like—we're excited to hear from you! And if we don't, we just might track you down! So start reflecting: what was your journey to the stars?

# BOOK REVIEW by Bruce Horrocks

O My Relatives are Weird

The interesting thing I find about spell check is how it tries to anticipate what I am trying to write. My article should be titled, “O My How Relativity is Weird” but this title will work for now. I just recently finished reading a book by Brian Cox and Jeff Forshaw, titled " Why Does E=mc2 (and Why Should We Care?). My wife finds my choice of books to read at night kind of strange too, thinking that it would be more appropriate if I were taking a college class and reading this was part of an assignment. But I do find physics to be interesting as well as something good to put me to sleep with on occasion.

The fascinating thing about this book is that Brian does a good job of deriving some very complicated equations dealing with some laws of physics based on a simple example using Pythagoras’ theorem (you know A2 + B2 = C2). Some of the noteworthy equations that he derives are that of Time Dilation and Length Contraction. If you are not aware of these equations and their connection with Einstein’s Special Relativity, then you are about to learn just a little bit. When you travel at very fast speed, like close to the speed of light, some very peculiar things begin to take place. First of all, we need to remember that everything is relative. So, if you are the one traveling then you might not notice much of a difference, but if there was a way we could observe you, we would watch your clock slow down and your spaceship or whatever you are using start to shrink. These two effects are Time Dilation and Length Contraction.

"Now that desk looks better. Everything's squared away, yessir, squaaaaaared away."

The equation for both of these effects is very similar as shown below:

$$\Delta t' = \frac{\Delta t}{\sqrt{1-\frac{v^2}{c^2}}} \qquad L = L_0\sqrt{1-v^2/c^2}$$

Now I don’t want to make this too complicated for those of you who really are not much into math, so we are just going to do one simple calculation with both of these equations. I have to admit that this will help you to understand all that time stuff more fully in the Interstellar movie, or when you talk about Black Holes and their effect on time. Let us say that you wanted to travel to the Andromeda Galaxy and find a new home. Let us also just use the distance of 2,500,000 light years away as how far you need to travel. Based on what we observe here on Earth, it takes 2,500,000 years for the light of Andromeda to get here, but what if we go there? We are going to assume that you can travel at almost the speed of light, just a bit slower, like one inch per second slower is all. You are traveling at speed “v”, and light is traveling at speed “c”, so the part of the equation that is v2/c2 is just about equal to 1, actually is it like 0.999999998. This makes the number in our denominator a very, very small. The delta t on the left side of the equation is the observed time for us here on earth and the delta t time on top is your time. If you want to do the math it works out that you would get to Andromeda in just about 35 years. Which implies with the length contraction equation that the distance just got shorten to 35 light years as well, but just for you. So, if you left tomorrow, you would arrive in the year 2059 by your clock. For those of us still on Earth it will be the year 2,502,024. Please don’t ask me how this all works, but this is all based on special relativity and all that space time continuum stuff you heard about in Back to the Future. If you want to read more about this, I would recommend this book to you. Mostly the reading is straightforward, but the last chapter or two was a bit over my head. Enjoy !

# River Heights Elementary
# Star Party

**The students at River Heights Elementary had a fantastic time at their star party, where they eagerly recorded what they learned. A big thank you to everyone who attended and lent a hand. Below are just a few of their reflections shared with us.**

At the Star Party I saw Saturn, learned a rocket ship was stuck in space, and learned about planets. ★ I learned that if there was life on another planet it would take over 100 years to find. I learned that their hot chocolate is delicious. I learned that somewhere in space has a group of ½ a million stars. ★ I learned about a spacecraft with people who are stranded, but they have enough food, water, and air. I learned that my little sister loves hot chocolate. I learned that it will actually seem darker if you turn on a light, actually make it a white light, because if you turn it off, it will seem darker because your eyes need to adjust but if you use red light then it is darker and makes it so you can see people, but not go blind. ★ I learned that if there was life on another planet it would take over 100 years to know. I learned that somewhere in space has a group of ½ a million stars. Galaxies have more stars in them, then those stars have more galaxies. ★ If you could see all the stars, the sky would be white. A star cluster is a gravitational pull pulling stars into a cluster. There might be other earth-like planets. ★ I learned all about the milky way galaxy. I learned about the space shuttle. Lastly I learned that the space shuttle goes 117,000 mph. ★ I could see the little rings around Saturn. I got to see one where you look at his phone and you can see a lot of stuff. I saw a laser pointer that they could point to the sky. ★ I learned that some of the galaxies were light years away and there are so many galaxies. They had a laser pointer that they could point in the sky. ★ One thing I saw was a star galaxy. It was so cool and the telescope was so cool. One thing I learned is that one of the reasons we can't see the stars too well is because there is high pollution where we live in America. It was really cool to see Saturn that close. It was so bright. And you could actually see the rings. The Star Party was so fun. ★ It was cool how you could see these things that aren't in our earth. They also had cool/bright lasers that they told me what it is. It was also cool that you could see other galaxies.★ I learned about a cluster of galaxies and in those galaxies are more galaxies. And that when you look at a star in the sky it looks just like a star, but when you look at it in a telescope you can see the color and Saturn you can see the rings spinning. And the Chinese spacecraft passed by and our spacecraft passed by. ★ A lot of the stars were galaxies not stars. ★ I think that it was really cool that we got to see Saturn. Another planet! And I also think that it is crazy how far you can see through those telescopes. That is a long way to see. ★ Cluster of ½ a million stars with the closest ones being ¼ of a light year away. Amazing hot chocolate. You could see Saturn. It looked like a child's drawing. ★ I learned a lot about Saturn and I learned how far some stars are and they also told me that there were 2 or 3 astronauts stuck in the space station. It was so much fun and everyone that was running it was very nice. It was so much fun and it was a great opportunity to learn about stars and galaxies. It was so fun, I would come to it again. ★ The Star Party was so cool. I saw Saturn and its rings. I also saw lots of constellations like Hercules, Big Dipper, and Little Dipper. I also saw many galaxies like the M51 and M31 which are also called spiral galaxies. I also saw a cluster of stars with half a billion stars. This is because all of the stars rotated in the same part of gravity. I also learned about Neptunes (nebulas?) which are caused by stars that pretty much exploded. It was super cool. We also got to see the space station flying around at about 2,500 miles per hour and apparently there are two astronauts in the space station that are pretty much living in there until another shuttle can come get them. (Graham) ★ I saw a star cluster that had ½ a million stars. I learned that a nebula is a star explosion. We see what stars looked like 120 million years ago. ★ I really liked the free hot chocolate and seeing Saturn.

# CACHE VALLEY ASTRONOMICAL SOCIETY
# MEMBERSHIP APPLICATION FORM

**Member # _____**

**NAME**:_____ _____ _____
First Middle Initial Last

**Address**:_____ _____ _____ _____
Street City State Zip Code

**Home Phone**: _____ **Cell Phone:**_____

**Work Phone** : _____ **Occupation** :_____

**Email Address**: _____

How did you learn about CVAS?

_____Website ____Star Party ____CVAS Member ____Other _____

Membership: $20 lifetime membership

Tell us about yourself: Do you have a special interest in astronomy? Do you have special skills? Are you willing to volunteer on CVAS projects or attend public outreach star parties? Astro equipment owned.

_____

_____

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By signing this application, I acknowledge I have access to the CVAS website, cvas-utahskies.org , and the CVAS constitution. I agree to abide by the constitution.

**Signature:** _____ Date:_____

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Bring this form to the meeting or contact **Dell Vance, Membership Coordinator** at avteam.dell@gmail.com.