

A CHRISTMAS STAR

KATHARINE PYLE

COME now, my dear little stars," said Mother Moon, "and I will tell you the Christmas story."

Every morning for a week before Christmas, Mother Moon used to call all the little stars around her and tell them a story. It was always the same story, but the stars never wearied of it. It was the story of the Christmas star—the Star of Bethlehem. When Mother Moon had finished the story the little stars always said: "And the star is shining still, isn't it, Mother Moon, even if we can't see it?" And Mother Moon would answer: "Yes, my dears, only now it shines for men's hearts instead of their eyes."

Then the stars would bid the Mother Moon good-night and put on their little blue nightcaps and go to bed in the sky chamber; for the stars' bedtime is when people down on the earth are beginning to waken and see that it is morning.

But that particular morning when the little stars said good-night and went quietly away, one golden star still lingered beside Mother Moon. "What is the matter, my little star?" asked the Mother Moon. "Why don't you go with your little sisters?" "Oh, Mother Moon," said the golden star. "I am so sad! I wish I could shine for some one's heart like that star of wonder that you tell us about." "Why, aren't you happy up here in the sky country?" asked Mother Moon. "Yes, I have been very happy," said the star; "but to-night it seems just as if I must find some heart to shine for." "Then if that is so," said Mother Moon, "the time has come, my little star, for you to go through the Wonder Entry."

"The Wonder Entry? What is that?" asked the star. But the Mother Moon made no answer. Rising, she took the little star by the hand and led it to a door that it had never seen before. The Mother Moon opened the door, and there was a long dark entry; at the far end was shining a little speck of light. "What is this?" asked the star. "It is the Wonder Entry; and it is through this that you must go to find the heart where you belong," said the Mother Moon.

Then the little star was afraid. It longed to go through the entry as it had never longed for anything before; and yet it was afraid and clung to the Mother Moon.

But very gently, almost sadly, the Mother Moon drew her hand away. "Go, my child," she said. Then, wondering and trembling, the little star stepped into the Wonder Entry, and the door of the sky house closed behind it. The next thing the star knew it was hanging in a toy shop with a whole row of other stars blue and red and silver. It itself was gold. The shop smelled of evergreen, and was full of Christmas shoppers, men and women and children; but of them all, the star looked at no one but a little boy standing in front of the counter; for as soon as the star saw the child it knew that he was the one to whom it belonged.

The little boy was standing beside a sweet-faced woman in a long black veil and he was not looking at anything in particular. The star shook and trembled on the string that held it, because it was afraid lest the child would not see it, or lest, if he did, he would not know it as his star. The lady had a number of toys on the counter before her, and she was saying: "Now I think we have presents for every one: There's the doll for Lou, and the game for Ned, and the music box for May; and then the rocking horse and the sled."

Suddenly the little boy caught her by the arm. "Oh, mother," he said. He had seen the star. "Well, what is it, darling?" asked the lady. "Oh, mother, just see that star up there! I wish—oh, I do wish I had it." "Oh, my dear, we have so many things for the Christmas-tree," said the mother. "Yes, I know, but I do want the star," said the child. "Very well," said the mother, smiling; "then we will take that, too."

So the star was taken down from the place where it hung and wrapped up in a piece of paper, and all the while it thrilled with joy, for now it belonged to the little boy. It was not until the afternoon before Christmas, when the tree was being decorated, that the golden star was unwrapped and taken out from the paper. "Here is something else," said the sweet-faced lady. "We must hang this on the tree. Paul took such a fancy to it that I had to get it for him. He will never be satisfied unless we hang it on too."

"Oh, yes," said some one else who was helping to decorate the tree; "we will hang it here on the very top." So the little star hung on the highest branch of the Christmas-tree. That evening all the candles were lighted on the Christmas-tree, and there were so many that they fairly daz-

(See Star on page 7)

How to Join the Delmarva Stargazers: Anyone with an interest in any aspect of astronomy is welcome

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Fleatown Rd, Lincoln, DE 19960. Call club President Don Surlles at 302-653-9445 for more information.

Asteroid 2005 YU55

Kent Blackwell

On November 8, 2011 the asteroid 2005 YU55 passed closer to us than the distance of the moon. Spotting it in the telescope would prove to be a challenge. Even at it's closest and brightest the asteroid would only reach 11th magnitude. Also, the phase of the moon was nearly full, making the sky incredibly bright.

Still, it was worth a try to find it. I set up my 14" Dobsonian telescope in the driveway early in the afternoon to have everything ready to go. I invited my friends Dianne Tennant and Robert Hitt to witness the event. The closest approach was around 6:30 pm, so each showed up about that time.

Using the computer-mapping program Sky Tools I tried matching the telescope field of view with the chart. That proved to be very difficult because some of the background stars were so faint that they were not visible due to the bright moonlight.

Although Dianne didn't get a chance to see the asteroid I did show her a bright Iridium satellite, the globular cluster M 15 in Pegasus, the planet Uranus and a wonderful, detailed view of Jupiter.

Soon after she left I continued trying to find the asteroid. It was at that point I realized the heater for my secondary mirror had failed and the mirror was totally fogged, cutting down the effective aperture of the telescope considerably. I corrected the problem and peering into the telescope the stars appeared much brighter. Within minutes, there it was, asteroid 2005 YU55 drifting slowly across the telescope's field of view! Sharing the view with Robert Hitt we were both enamored with what we saw. Wow, it was fantastic, and surely the best I've ever seen it!

Life's Unexpected Bonuses...

Don Surles

Yes, most of us anxiously await anticipated bonuses long before their arrival, but occasionally life will deliver a really unexpected and undeserved extra...one that makes a genuine difference.

Meeting and knowing, working and relaxing with Frank Sheldon was one of those rewards.

I met Frank long after he had retired as a chemist for a Dover chemical manufacturer and by that time he was also a cancer survivor. He came to us via the Dover Art League... where he was also an accomplished local artist. His watercolors are so very nice. For info, there were a few other DAL members who found their way to the Star Gazers about the same time.

Frank was one of the very early members of Delmarva Star Gazers and embraced our organization with an energy that simply amazed me, and others, at the time. He took over the duties of creating our Delmarva Star Gazer News and really changed it from a one-pager of text only to the multi-page text & graphic format we are so familiar with today. Remember...this was in the mid-late '90's when "WWW." was very young. Prior to that the internet was a text only world where FTP did not mean you were getting or sending flowers.

But Frank and others in our organization setup our website, www.delmarvastargazers.org, and fleshed out what has become the communication center of our organization.

As you all know, Frank and Kathy (our treasurer) were married a few years later and enjoyed their retirement at their home on the lake in Lincoln, DE.

I will miss Frank. He passed away in late October after a long illness. Frank was a good person, a good friend and a great Delmarva Star Gazer.



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Re-thinking an Alien World: The Strange Case of 55 Cancr i e



Forty light years from Earth, a rocky world named "55 Cancr i e" circles perilously close to a stellar inferno. Completing one orbit in only 18 hours, the alien planet is 26 times closer to its parent star than Mercury is to the Sun. If Earth were in the same position, the soil beneath our feet would heat up to about 3200 F. Researchers have long thought that 55 Cancr i e must be a wasteland of parched rock.

Now they're thinking again. New observations by NASA's Spitzer Space Telescope suggest that 55 Cancr i e may be wetter and weirder than anyone imagined.

Spitzer recently measured the extraordinarily small amount of light 55 Cancr i e blocks when it crosses in front of its star. These transits occur every 18 hours, giving researchers repeated opportunities to gather the data they need to estimate the width, volume and density of the planet.

According to the new observations, 55 Cancr i e has a mass 7.8 times and a radius just over twice that of Earth. Those properties place 55 Cancr i e in the "super-Earth" class of exoplanets, a few dozen of which have been found. Only a handful of known super-Earths, however, cross the face of their stars as viewed from our vantage point in the cosmos, so 55 Cancr i e is better understood than most.

When 55 Cancr i e was discovered in 2004, initial estimates of its size and mass were consistent with a dense planet of solid rock. Spitzer data suggest otherwise: About a fifth of the planet's mass must be made of light elements and compounds—including water. Given the intense heat and high pressure these materials likely experience, researchers think the compounds likely exist in a "supercritical" fluid state.

A supercritical fluid is a high-pressure, high-temperature state of matter best described as a liquid-like gas, and a marvelous solvent. Water becomes supercritical in some steam turbines—and it tends to dissolve the tips of the turbine blades. Supercritical carbon dioxide is used to remove caffeine from coffee beans, and sometimes to dry-clean clothes. Liquid-fueled rocket propellant is also supercritical when it emerges from the tail of a spaceship.

On 55 Cancr i e, this stuff may be literally oozing—or is it steaming? —out of the rocks.

With supercritical solvents rising from the planet's surface, a star of terrifying proportions filling much of the daytime sky, and whole years rushing past in a matter of hours, 55 Cancr i e teaches a valuable lesson: Just because a planet is similar in size to Earth does not mean the planet is like Earth.

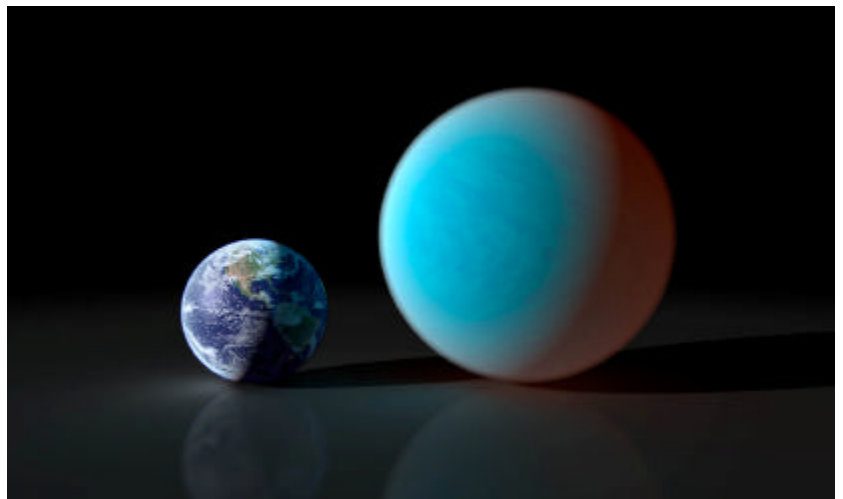
It's something to re-think about.

Get a kid thinking about extrasolar planets by pointing him or her to "Lucy's Planet Hunt," a story in rhyme about a girl who wanted nothing more than to look for Earth-like planets when she grew up. Go to <http://spaceplace.nasa.gov/story-lucy>.

The original research reported in this story has been accepted for publication in *Astronomy and Astrophysics*. The lead author is Brice-Olivier Demory, a post-doctoral associate in Professor Sara Seager's group at MIT.

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

Artist's rendering compares the size Earth with the rocky "super-Earth" 55 Cancr i e. Its year is only about 18 hours long!



The Pitfalls of Great Optics

Don Surles

Everyone wants the best telescope he can buy, trade for, inherit, or build. We all want a scope that produces no false color or coma, one that focuses light with diffraction rings around every star, one that never dewes up, has no jiggles and of course it must be LARGE. For the average amateur astronomer such a scope is not feasible as a retail purchase.

With that in mind our industrious amateur astronomer/mirror maker/telescope maker/dreamer set out to build his dream scope. He started with a diameter...40 inches! Next he finagled a 40" Zerodur blank and a quartz diagonal flat secondary. Both pieces of glass would never suffer from figure deformities due to temperature changes.

He tackled that big old Zerodur blank with fervor...the sagitta slowly deepened to the proper depth. Next, days and days of fine grinding were followed by more days and days and days of polishing. Then came the figuring...babies are born with less fuss than was put into that figure. He figured...tested, figured, tested, figured and tested over and over. He used the Ross-Null Test, the Double-Pass Autocollimation Test and then tested each test against the other. Finally, after months of figuring and testing and figuring and testing...he declared success! He had made the PERFECT primary...and rated it a 1/1000th wave accuracy.

While the primary and secondary were out being coated with an Ion Deposition/Planing process of 100% reflective space-age coating he began assembling the scope. The dec bearings would be 50% larger than the mirror diameter, yes, those dec bearings were 60" just to be sure he had a steady mount. He used only the best virgin Teflon and Ebony Star Formica for bearing surfaces.

The primary would be held in a 27-point flotation cell to ensure there would be no strain on the primary. And he placed a computer controlled anti-dew heater on the secondary that would hold the secondary temperature precisely 1.647 F degrees above ambient temperature at all times.

Then he placed his order for a new set of Televue Ethos eyepieces. The newly coated mirrors arrived and he assembled his dream scope. Finally, after many, many...yes, many, many months of passionate work his masterpiece was assembled and ready for first light.

That's when it began raining...rained for a whole lunar cycle. Eventually Mother Nature relented and opened the skies. Our industrious amateur astronomer/mirror maker/telescope maker/dreamer set out to use his dream scope. The night was clear. The skies were calm and dark - he was on the backside of a cold front. The heavens awaited and offered all of its heavenly wonders just for the taking.

Our industrious amateur astronomer/mirror maker/telescope maker/dreamer collimated his optics once more...then aligned the finders with the main tube and slipped in that new Ethos to go "Star Huntin". That big 40"er, built with passionate TLC stared at the heavens with an arrogant "Bring it on" attitude.

Our astronomer was a bit unsettled when he looked at the first star...it seemed to go blink, blink, blink...diffraction rings and all. He tried another of those \$700 Ethos eyepieces...again there was that blink, blink, blink...just with a different frequency. Another Ethos and the same blinking...this blinking was similar to a digital signal that is frequently going away...think cell phone. Instead of "Can you hear me now?" the object seemed to say "Can you see me now?".

Our industrious amateur astronomer/mirror maker/telescope maker/dreamer had inadvertently discovered a previously unknown law of physics. It seems finely focused light travels faster than improperly or non-focused light. This resulted in "gaps" of blackness in the finely focused light between the primary and eyepiece simply because this "finely focused light" traveled faster than the light striking the primary. So, the net result was a rat-a-tat-tat-tat series of blackness followed by a focused image.

And our industrious amateur astronomer/mirror maker/telescope maker/dreamer naively believed he could "fix" this problem by improving the collimation. Apparently it worked...the frequency of the tat-tat-tat was much slower after the collimation but the duration of blackness increased with a corresponding decrease in time for the image apparition. As he moved from object to object the tat-tat-tat became slower and slower with resulting wider gaps of blackness between the fleeting images. But, the reward was a 1080P LED LCD 120mhz 10,000,000:1 contrast ratio image of the heavenly target...for those brief, fleeting

moments he had never seen such sharp, clear, contrasty, vivid images of his favorite objects.

Our industrious amateur astronomer/mirror maker/telescope maker/dreamer had no way of knowing what was about to happen. The gaps between images became much wider... yes, much, much wider, that is, the longer durations of blackness were followed by shorter durations of the 1080P LED LCD 120mhz 10,000,000:1 contrast ratio image. It should have been apparent something very strange was about to happen. This scope was generating its own force field...it was changing the relationship between light and time.

Then it happened! Just like a runaway nuclear reactor...Time conquered Light and Blackness prevailed! That big 40" scope with 1/1000th wave optics and our industrious amateur astronomer/mirror maker/telescope maker/dreamer disappeared into a time warp where there is no light, apparently an amateur astronomer's own "telescopic black hole"...a place where that "black gap" is forever.

So...just how good are the optics in your scope?

Club's Lunt Solar Scopes

Jerry Truitt

Our Sun is very active right now; every day is an interesting view. I have one of our club's Lunt H-Alpha 60mm Solar scopes and have been taking advantage of having a solar scope every day I can.

The scope is small and easy to take with me so I make a point of setting it to show the public every chance I get. Don Surles made a sun finder which works great, its just a front disk with a small hole, the light shines through the hole onto a back board. You'll want to use the lowest powered eye piece the first find.

The scope set up is pop up the mount, attach the scope, finder and put in an eye piece. Set the focus about half way out, it will be fully in for storage. Now adjust the draw tube out until the focus is close and lock. This is important as the draw tube will fall out with the diagonal and eye piece.

'People are always totally blown away that they can see the surface of the sun. I get some looks when I pull up someplace and pull out the scope, people just look but won't come over. I have to ask; "Hey you want to look at the Sun?". As soon as the first person takes a look, that's it, they'll start yelling to everybody else "Hey, you got to see this, it's amazing!"

I had my Cannon Powershot camera with me one day and decided I would see what I could get just by holding the camera up to the lens. The picture came out great, I was really shocked. With the first pictures found the surface tends to white out so you can't see spots very well but the edges are clearly visible so the prominences can be seen.

I've had an Orion SteadyPix Universal Camera mount for years sitting in my box and thought this might be a good application for its use. It does indeed work great and improved the quality of my pictures. The SteadyPix was not designed for Naglers however so I had to do some modifications to make it work. The wide angle view of the Nagler is much better for through the eye piece picture taking. The other thing I learned was to use the delayed timer on my camera; this prevents the shake I get from pressing the release button on my camera and resulting blurred the shot.

One of the other things that's unusual about photography with the Lunt scope is you have to look around in the lens, straight on the brightness of the Sun's surface will wash out things like sun spots on the surface but if you get the right angle the image will get darker and the camera will then pick up the spots.

The pictures aren't as good as the Solar Dynamics Observatory but hey they have a better location and spent a lot more money too.

The camera doesn't surpass the thrill of seeing the Sun live, nothing beats looking through the lens. If you're a club member contact Lyle about borrowing one of the Lunt scopes. We'll also be having some solar observing days so watch the Yahoo site for information about place and times.

See some of Jerry's pics on page 8.

(Star from page 2)

zled the eyes; and the gold and silver balls, the fairies and the glass fruits, shone and twinkled in the light; and high above them all shone the golden star.

At seven o'clock a bell was rung, and then the folding doors of the room where the Christmas-tree stood were thrown open, and a crowd of children came trooping in. They laughed and shouted and pointed, and all talked together, and after a while there was music, and presents were taken from the tree and given to the children. How different it all was from the great wide, still sky house! But the star had never been so happy in all its life; for the little boy was there.

He stood apart from the other children, looking up at the star, with his hands clasped behind him, and he did not seem to care for the toys and the games. At last it was all over. The lights were put out, the children went home, and the house grew still.

Then the ornaments on the tree began to talk among themselves. "So that is all over," said a silver ball. "It was very gay this evening—the gayest Christmas I remember." "Yes," said a glass bunch of grapes; "the best of it is over. Of course people will come to look at us for several days yet, but it won't be like this evening."

"And then I suppose we'll be laid away for another year," said a paper fairy. "Really it seems hardly worth while. Such a few days out of the year and then to be shut up in the dark box again. I almost wish I were a paper doll." The bunch of grapes was wrong in saying that people would come to look at the Christmas-tree the next few days, for it stood neglected in the library and nobody came near it. Everybody in the house went about very quietly, with anxious faces; for the little boy was ill.

At last, one evening, a woman came into the room with a servant. The woman wore the cap and apron of a nurse. "That is it," she said, pointing to the golden star.

The servant climbed up on some steps and took down the star and put it in the nurse's hand, and she carried it out into the hall and upstairs to a room where the little boy lay.

The sweet-faced lady was sitting by the bed, and as the nurse came in she held out her hand for the star. "Is this what you wanted, my darling?" she asked, bending over the little boy.

The child nodded and held out his hands for the star; and as he clasped it a wonderful, shining smile came over his face.

The next morning the little boy's room was very still and dark. The golden piece of paper that had been the star lay on a table beside the bed, its five points very sharp and bright. But it was not the real star, any more than a person's body is the real person.

The real star was living and shining now in the little boy's heart, and it had gone out with him into a new and more beautiful sky country than it had ever known before—the sky country where the little child angels live, each one carrying in its heart its own particular star.

About KATHARINE PYLE:

Katharine Pyle was one of Delaware's most prolific authors, having had a part in the creation of more than 50 children's books. Born in Wilmington November 22, 1863, the youngest of four children. Her parents, William Pyle and Margaret Churchman Painter Pyle, were of old Wilmington Quaker families.

In 1879, while a 16-year-old student at Wilmington's Misses Hebb's School, her poem "The Piping Shepherd" was published in Atlantic Monthly. She studied at the Philadelphia School of Design for Women with classmates such as Bertha Corson Day and at Drexel Institute in her brother's illustration class. Two of her works from that class were exhibited in 1897 at Drexel.

She illustrated books as early as 1895 and is said to have had a play published in 1898 by Ladies' Home Journal, but her real success as a writer and artist began in the same year with the publication of The Counterpane Fairy by Dutton. This book, which she both wrote and illustrated, enjoyed popularity for the next 40 years and is still known today.

Katharine published more than a book a year from 1898 to 1934. She authored two works of Delaware history. Once Upon a Time in Delaware, 1911, edited by Emily P. Bissell and illustrated by Ethel Pennewill Brown, was a somewhat fictionalized account for children of certain events in Delaware history. "The Story of Delaware, A New and Careful History of Our State" was serialized in 1924 in the Wilmington Sunday Morning Star.

She is known to have painted formal portraits of a number of local people. Her portrait of Dr. Albert Robin hung in Wilmington General Hospital.

Katharine was generous with her time and money and active in the Swedenborgian Church to which she converted. She used her own energy and her many friends in Wilmington society to press for social reform, especially in the field of juvenile justice.

Katharine Pyle died February 19, 1938 at her residence at 804 North Franklin St., Wilmington.

Astrophotos by Jerry Truitt using the Lunt Solar Scope



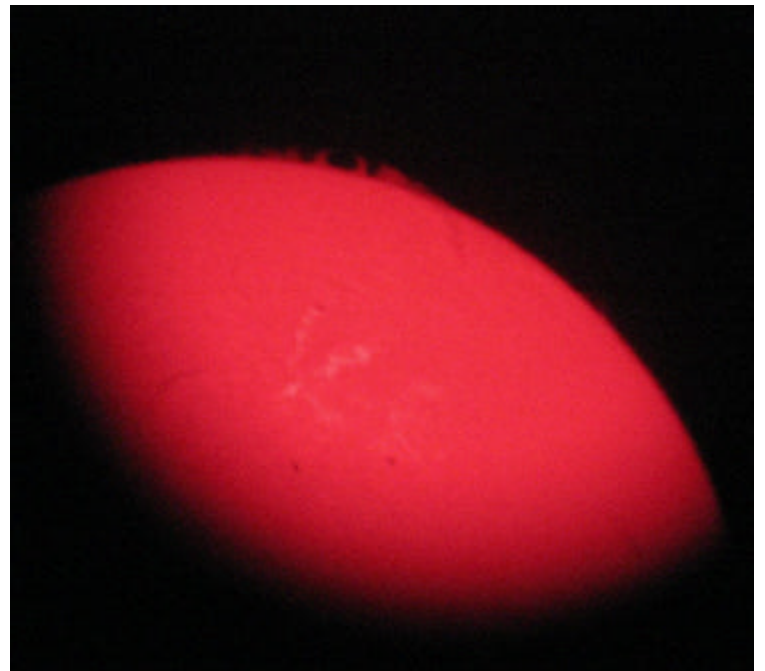
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The setup



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