

The Astronews



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Seeing Stardust (a deep sky project for the novice) by Jane Houston Jones

The Milky Way looks like a river of tiny diamonds sprinkled with dark stardust this month. Follow this ribbon river from the northeast, near Cassiopeia across the sky to the constellation Sagittarius above the southern horizon. Notice how the Milky Way divides into two streams overhead. Between these two streams lies a dark band of starlight-obscuring dust. Also notice that the Milky Way stream thickens and brightens as it races southward toward the horizon near Sagittarius. This clumpy cloudy bulge is called the Sagittarius Star Cloud. In this direction lies the galactic center of the Milky Way.

(Continued on page 6)

Inside this issue:

President's Report	2
Observer's Notebook	3
Article	4
Meteor Log	5
Member Sketch of the Moon	8
Star Lore	8
Minutes	9
Treasurer's Report	10

Upcoming Star Parties

Club Party	August 3	Dillingham
Public Party	August 10	Dillingham
Public Party	August 17	Kahala Park
Public Party	August 31	Dillingham
Club Party	Sept. 7	Dillingham
Public Party	Sept. 14	Kahala Park



Special points of interest:

- The next meeting is 7:30 on Aug. 6 at Bishop Museum
- **Sam Rhodes** next Planetarium show on Mon. Aug. 5th. Hanauma Bay show will be on Aug. 12. Gates close at 8:00

President's Message

by Gretchen West

Club members are like the stars they view. Some are right there, easily visible, while a great many of our members become more visible when you look a little harder for them. Our club is made up of such a wonderful variety of interesting people who have found their own degree of visibility or involvement as a club member of the HAS.

It often takes a club like ours to nurture an amateur or sidewalk astronomer. I have witnessed this first hand many times during my tenure. In fact, the past several years we have nurtured quite a few.

New members are a great source of new energy and interest. But the veteran members, who have been the stalwarts of the club, have been there to provide the information and know-how to help others to advance the newcomer's knowledge, understanding, and enjoyment of the sky.

Whatever our other commitments, we all have a basic interest and love for the objects that present themselves to us if we only stop to look up and see them. Summer, Autumn, Winter, and Spring, the skies are there for our enjoyment. And our strength as a club is that we are able to do this together with a shared sense of purpose, knowledge and pleasure.

To each member, whatever kind of member you may be, you are vital to our organization. Thank you for being and HAS member!

Gretchen

P.S. Now that we have our coordinator (see page 9), I would like to give a big "Thank You!" to everyone who has stepped up to help with outreach Star Parties. I hope that people, such a Claire and Mel Levin, will continue their involvement in this area.

Hawaiian Astronomical Society
P.O. Box 17671
Honolulu, Hawaii 96817

President

Gretchen West
735-0482
gwest@pixi.com

Vice President

Barry Peckham
524-2450
barry@litebox-telescopes.com

Secretary

Chris Trusty
395-2525
ctrusty@hawaii.rr.com

Treasurer

Jim MacDonald
261-2162
jim.macd@verizon.net

Board Members-at-Large

Don Tucker
833-2134
Nick Bradley
735-3634

The **Astronews Editor**

Paul C. Lawler
395-8121
paul@lawler.name

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Planets Close to the Moon

Times are Hawaii Standard Time

- Aug 5, 02h, M 2.0° N of Saturn
(47° from sun in morning sky)
- Aug 9, 18h, M 4.1° NNE of Mercury
(19° from sun in evening sky)
- Aug 11, 17 h, M 5.5° NNE of Venus
(46° from sun in evening sky)
- Aug 20, 20h, M 4.1° SSE of Neptune
(160° from sun in evening sky)
- Aug 22, 07h, M 4.0° SSE of Uranus
(176° from sun in midnight sky)









Mars and Jupiter are closer than 15° from the sun when near the moon in August.

Other Events of Interest

Times are Hawaii Standard Time

- Aug 1, 15h, Neptune at Opposition.
- Aug 5, 21h, Mercury 0.82° NNE of Regulus
(16° from sun in evening sky)
- Aug 8, 09:15h, New Moon
- Aug 10, 13h, Mars at Conjunction with sun,
passes into morning sky.
- Aug 12, 01h, 2 Pallas at Opposition
- Aug 14, 02h, Mars farthest from Earth (2.7 au)
- Aug 19, 15h, Uranus at Opposition
- Aug 22, 03h, Venus at greatest elongation
(46.0° east of the sun)
- Aug 22, 12:29h, Full Moon
- Aug 31, 09h, Venus 0.80° SSW of Spica
(46° from sun in evening sky)
- Aug 31, 24h, Mercury at greatest elongation
(27.2° east of the sun)

The Planets in August

 Mercury Mercury is visible in the evening sky late in the month, reaching greatest elongation on Aug 31.	 Venus Venus dominates the western sky after sunset Near Spica on Aug 31. Mag. -4.4.	 Mars Mars reaches opposition on August 10 and is lost in the glare of the sun this month.
 Jupiter Jupiter was at opposition last month. It won't be visible until late August, low in the east at dawn.	 Saturn Saturn is visible in the early morning sky, rising about 3 hours before the sun.	 Uranus Uranus is at opposition this month and is in the sky all night. Mag +5.7
 Neptune Neptune is also at opposition this month. Look for it in late evening. Mag +7.8		 Pluto Pluto is well placed for viewing in the evening sky in Ophiuchus but is very faint at mag. +13.8.

Dark Adaptation

The Eye & Light

Light passes through the cornea and lens of the eye and is focused onto the retina at the back of the eye. The retina, which covers the inside orb of the eyeball, is a collection of photoreceptors, nerve cells and pigment epithelium. The photoreceptors are the points at which light reaction occurs and the beginnings of the nerve impulse of sight. The retina contains two types of photoreceptors - Rods (100 million) and Cones (6 million).

Dark Adaptation

The increase in sensitivity of the eye to detection of light that occurs in the dark is called "dark-adaptation". The pupil dilates and both neural (largely unknown) and biochemical changes occur in the retina. In darkness, after exposure to bright light that bleaches the visual photopigments, there is an initial hundred-fold increase in sensitivity following an exponential time course that reaches a plateau after 5 to 9 minutes. This initial phase is attributed to regeneration of photosensitive pigments in the cones. Following this, there is a thousand to one hundred thousand increase in sensitivity following a slower exponential time course that reaches a plateau in 30 to 40 minutes. This second phase is attributed to regeneration of Rhodopsin in the rods. In addition to Rhodopsin regeneration, neural changes increase sensitivity further. Dark-adaptation is delayed by prolonged exposure to bright light. Thus, it does take longer to reach maximum adaptation at night after a day in bright sunshine.

When fully dark adapted, the retina is about 100,000 times more sensitive to light than when light-adapted.

Exposure of the dark-adapted eye to bright light results in a marked decrease in sensitivity involving two changes: (1) a neural process that is completed in about 0.05 seconds and (2) a slower process, apparently involving the uncoupling of retinal and opsin in Rhodopsin, occurring in about one minute. Note that change in pupil diameter accounts for only a ten-fold change to light adaptations.

Averting Vision

The dark-adapted retina is most sensitive in the region 2.5 mm out from the fovea centralis. The fovea is the area directly behind (across from) the pupil. When looking directly at an object it is projected at the fovea. For this reason looking slightly to one side of an object will project the object on this most sensitive area. Further, the nasal (medial) periphery of the retina has the highest concentration of rods. Theoretically, looking to the left side of a dim object with your right eye (opposite for the left eye) should give best results for "averting" vision. The downside to this specific maneuver is that the "blind spot" where the optic nerve exits the eyeball is also in the medial area. No rods or cones are in this area and an object focused on this area will not be seen—at all.

Space Travel—Gift of a Dinosaur

by Barry Peckham

The Age of living dinosaurs,
Now gone with scarce a trace,
Bequeathed to us a noble goal
that sent us into space.

We did not copy bugs or bats when
Building our first wings.
Sure, they could fly, but folks were
Mostly grossed out by those things.

We were inspired instead by brightly
Feathered fowl in flight.
Our spirits rose to join with those
who soared at such great height.

The notion that a bird can travel
Freely in 3-D
Gave us a thrill unmatched by fish
We couldn't rightly see.

And having too a bird's eye view
I nspired our sharpest minds
While dwelling in our wildest dreams
Through all of olden times.

So we must credit dinosaurs
for putting us in space.
They made the feather and the bird
to lift the human race.



Meteor Log—August 2002

by Mike Morrow

North of the Equator it is Perseid time. Sporadic rates continue to rise and there a few reasonable

minor showers. The Moon is out of the way for the Perseids and so all we nee is clear skies. Guess Xena has done something right.

Thursday the 8th, the North Delta Aquarids. Radiant 22h20m -05 degrees. This shower is the less active branch of the Delta Aquarids. One might expect 2 to 4 meteors per hour. This year is favorable since the maximum coincides with new Moon. The shower (dirzzle) produces chiefly faint, medium speed meteors.

Monday the 12th and possibly Tuesday the 13th, the Perseids. Radiant 03h04m +57 degrees. Rates run

from about 10 per hour to near 70 per hour. On the 12th the maximum is about 22 hours UT (noon our time) and on the 13th about 08 hours UT (10 PM our time). The Moon is only about 4 to 5 days old and should not be a real pest. Perseids are fast, bright, and frequently leave persistent trains.

Sunday the 18th, the Kappa Cygnids. Radiant 19h04m +59 degrees. Expect only a meteor or two per hour. They are slow, sometimes brilliant. The Moon will set soon after midnight and then one might see something unique.

If you are interested in observing Meteors contact Tom Giguere on Oahu at 672-6677

Stardust (Continued from page 1)

July is the best time of the year to observe the Galactic Center. It's a brilliant area of the sky in more ways than one! Not only is it a great area to scan with binoculars and small telescopes, it is chock full of starry clusters and bright dusty glows interspersed with snakey black dust. There are some magnificent clusters and nebulous objects that you are already familiar with. We'll use them as guideposts. But this bright cloud also holds many surprises - one of which will thrill you and give you something to show the more experienced observer near you at your next star party!

We'll begin our journey with a visual scan of the Sagittarius Star Cloud and get familiar with the neighborhood. The constellation Sagittarius is prominent in the south/southwest this month. It is easier to locate the teapot asterism rather than try to see the whole constellation figure Sagittarius the Archer. It really does look like a teapot, and the Sagittarius Star Cloud really does look like the steam spewing forth from the kettle.

First, follow the larger fork of the Milky Way river east of the dust band where they split overhead. This dust features prominently in our observing target this month.

The spout of the teapot is identified by the star Gamma Sagittarii. To the north and west of this bright star lies the richest star cloud in the sky containing millions of stars all clustered in this central bulge of our galaxy. Dr. E. E. Barnard, who made

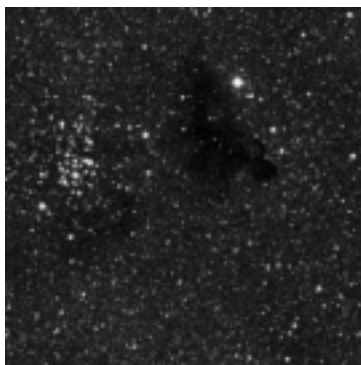


the first wide-angle photographs of our Milky Way at Lick Observatory atop Mount Hamilton in San Jose California in 1889, pondered the dark regions visible among the mass of stars. Barnard 86, an incredible dark nebula, is one of his discoveries. Earlier astronomers thought these dark regions were simply areas where there weren't any stars. Barnard thought the opposite - that these empty areas were actually concentrations of matter blocking our view. He was correct.

Millions of stars are clustered near the center of the Milky Way in the Sagittarius Star Cloud. Black snakey lines of dark clouds obscure some of the brilliant center of our galaxy. Right smack in the center of this brilliant starry backdrop lies a unique object. Dark nebula Barnard (shortened to B) 86, rimmed by the beautiful and symmetrical open cluster 9th magnitude NGC 6520. This little cluster of 25 stars range from magnitude 9 to 12, and form a perfect little circle with B-86 on its western side. "It appears as a distinct inky spot against the surrounding star-shimmer", wrote Robert Burnham, Jr. when

describing this object in his *Celestial Handbook*.

These dark nebulae are visible in amateur telescopes. Using low power and a wide field even the smallest telescope will reveal dark nebulae. The best place to look for dark nebulae, sometimes referred to as coal sacks, is the Milky Way with its seemingly unending supply of background stars. The finest example of a dark nebula lies just 2.7 degrees North of our starry guidepost, Gamma Sagittarius! It's found at RA 18 02.7 Dec -27 50.

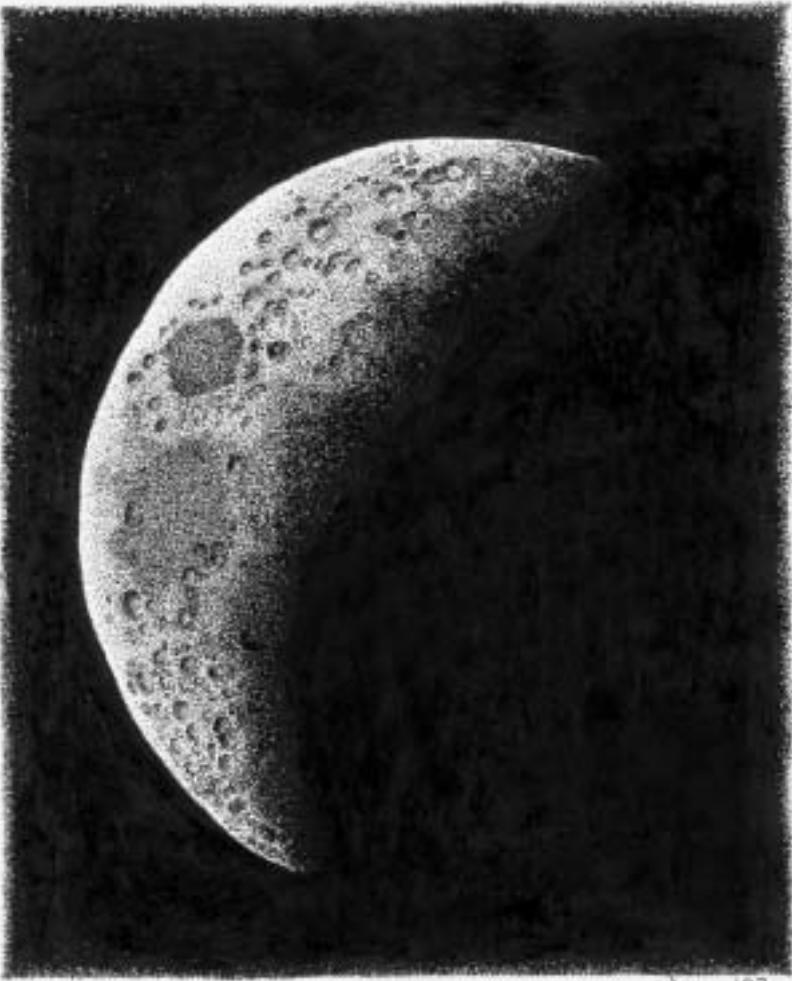


The size of the dark nebula is 4.5' by 3', and the cluster measures 5' in diameter. Together they are about the size of many of the nearby Sagittarius Messier clusters. The nearest one for comparison is globular cluster M24 located nearby - 0.8 degrees (a little more than one index finger width) above Lambda Sagittarii, the top of the "Lid" of the teapot. M24 measures 11', comparing to B86 and its companion open cluster which together measure 9.5'. Another way to easily find B86 is to hop down 5 degrees from M8, the Lagoon Nebula, the finest diffuse nebulae in the summer sky, and easy to see naked eye above Sagittarius. The nucleus of the Milky Way is only 4 degrees west of B86, making this patch of dark all the more remarkable. Dark nebulae do not jump out at you like other deep sky objects. It helps to be observing in a dark sky. It also helps if the nebulae have a distinctive shape. Luckily, B86 does have a distinctive shape. It's round, like a neat splotch of ink, which is why it is nicknamed Barnard's Ink Spot. It is shocking to see this small symmetrical batch of black surrounded by stars and starclouds in the Milky Way brightness.

Know the field of view in your telescope's finder and you will have no trouble hopping up to this magnificent object from Gamma Sagittarii. It reminds some of a black widow spider with a dark inky body and a smaller shimmering head.

If you enjoy discovering B86, Barnard's Ink Spot, there are a dozen more to enjoy within the Sagittarius Star Cloud. Well known and easiest to see is B85, the dark regions in the Trifid nebula M20. Several dark nebula B88, 89 and 286 are the dark regions of the Lagoon Nebula, M8. And just 4.5 degrees south of cluster NGC 6520, (the dainty circle of stars on the edge of the Ink Spot nebula) is B76, known as the Parrots Head nebula. There are another dozen or so Barnard dark nebulae next door in Ophiuchus. Not all atlases show dark nebulae. Uranometria 2000.0 is a popular atlas which does show dark nebulae such as B86 (on page 339) and the Tirion Atlas shows it on chart 22.

Now, when you look at the dust lanes within spiral galaxies such as M31, the Andromeda Galaxy, you'll be able to compare it to the great rift overhead in the summer Milky Way. Imagine how our "dust lane" might appear to an observer on a far off world. Dr. Barnard's beautiful little black Ink Spot, B-86 is a glimpse of real stardust. Dusty primordial matter - the stuff of future stars.



Star Lore — α Canis Majoris

Once upon a time in India there were five princes who left their kingdom to seek the kingdom of heaven. With them they took food and drink for the journey; and the prince Yudistira brought his dog Svana. Now besides Yudistira, who was the eld-

est, the brothers were Sahadeva the all-wise, who was learned beyond other men; Nakula the all-handsome, famed for his grace and beauty; Arjuna the all-powerful, who had never been defeated in any contest of arms;

(Continued on page 10)

“Luke—I am Your Father”

Visual astronomy is really a very calm, relaxing hobby... sometimes difficult for us toy boys (not boy toys, mind you... you need to find a gym for those) who always seem to have more money than sense, and the latest high-tech gadgets (*nudge nudge* *wink wink* Gary). I suspect many of us eventually gravitate to astrophotography (which seems to empty wallets very fast), but for those left behind, there is at last, a light at the end of the tunnel... and it's a laser!

The green light saber you have seen showing up at star parties is called a *SkyPointer™*. Under dark sky conditions, the beam from a 5 milliwatt green laser pointer creates a dramatic impression, and the beam apparently extends for hundreds of meters. Any light pollution (or the Crescent Moon), will attenuate the apparent brightness of the laser although it usually will remain visible. The effect of light pollution acts in such a way that people closer to you will still see the beam, whereas those further away may have difficulty.

Your editor's pointer came from Howie Glatter. Learn more about them at <www.skypointer.net>. They are pretty pricey at \$220, but a darned sight more focused and less glaring than the zillion candlepower white flashlights.

Minutes

by Chris Trusty

President, West, called the meeting to order at 7:40pm and welcomed members and visitors.

Claire Levin shared a thank you note from Niu Valley Middle School.

Jay Wrathal announced the sale of various astronomy equipment from B.Y.U. **Mike Shanahan** showed video of the news coverage of the Eclipse event at Bishop Museum on July 10th. Four T.V. stations covered the event. Mike thanked the club and the volunteers for making the event so successful.

Harry Zisko showed how to make a tripod more stable. **Stephanie Chouquette** gave a report on the June star parties. Weather was clear and the seeing was great. She also gave a report on a book that she finds fun and interesting; *Overlooked Objects* by Brent Watson.

Barry held the monthly drawing.

Tom Guigere won the door prize. **Jim Deluze, Kevin Polk, Alexander Andrade, Stephanie Chouquette,**

Coordinator Found!

We would like to thank club member, **Forrest Luke**, who has agreed to coordinate all outreach activities on Oahu for the club. If you have made commitments already, or if you are contacted in the future, please pass all information along to Forrest by e-mail at <lukef003@hawaii.rr.com> or phone the info to 623-9830.

and **Claire Levin** will let Barry know what they will be doing. **Dr. Churn** volunteered to talk about astronomy at the next meeting.

Barry reported that the C14 is in need of repair. **Ray Fabre** is looking for volunteers to help return the scope to operational condition. If you are interested in helping call Barry or Ray.

Meeting broke for refreshments at 8:45pm and reconvened in the planetarium at 9:00 for a “sky tonight.” Meeting adjourned at 9:45pm.

Treasurer's Report

by Jim MacDonald

HAS Financial Report as of July 15, 2002

Initial Balance:	\$5,815.98
Receipts:	
Donations	20.00
Dues Received	105.00
Interest Income	34
Other Income	6.48
Magazine Payments	89.90
T-Shirt Sales	15.00
Telescope Fee	60.00
Total Income:	\$296.72
Expenses:	
Astronews	151.52
Postage	37.00
Magazine Subscription Payment	86.38
Equipment	8.32
Refreshments	16.28
Overpayment Refund	1.00
Total Expenses:	\$300.50
Final Balance:	\$5,812.20

Since last month, we have had five new members join HAS. They are James O. DeTour, Shawn M. Carter, Patsy M. Pang, Frank W. Henderson and Steven M. Kusmierczyk. Welcome to the club. Many thanks to Bert Neuman for his donation and finally, ***Clear skies to the many members renewing this month!***

(Continued from page 8)

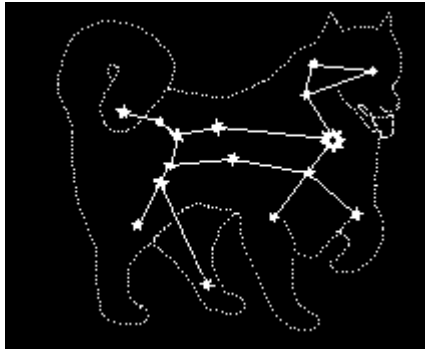
and Bhima the all-joyful, known far and wide for his good temper and love of pleasure.

So they set forth, and journeyed many days and many nights. Presently they came to a fair, where music was playing and people were drinking and dancing and feasting. Some of them saw Bhima the all-joyful, and called out for him to come and join them. Bhima said to himself, "I will rest here today and be happy, and seek the kingdom of heaven tomorrow." So he entered into the dance. And Yudistira and his brothers Sahadeva and Nakula and Arjuna and his dog Svana went on without him.

They traveled for many days and many nights, till they came to a broad plain where a great army was drawn up in ranks facing the enemy. When the soldiers saw Arjuna the all-powerful they shouted out, summoning him to come and lead them into battle. Arjuna said to himself, "I will fight today for my country, and seek the kingdom of heaven tomorrow." So he joined the soldiers; and Yudistira and his brothers Sahadeva and Nakula and his dog Svana went on without him.

So they traveled for many days and nights, till they came to a magnificent palace surrounded by a garden full of flowers and fountains; and in this garden

a beautiful princess was walking with her attendants. When she saw Nakula the all-handsome she was seized with love and longing, and she cried out for him to come nearer. Nakula too was struck with love, and said to himself, "I will stay with this princess today, and seek the kingdom of heaven tomorrow." So he went into the garden, and Yudistira and his brother Sahadeva and his dog Svana went on without him.



They journeyed on for many weary days and nights, until they came to a great temple. When the holy men who lived there saw Sahadeva the all-wise they ran out, inviting him to come and join them in prayer and study. And Sahadeva said to himself, "I will stay here today, and seek the kingdom of heaven tomorrow." So he went into the temple, and Yudistira and his dog Svana went on without him.

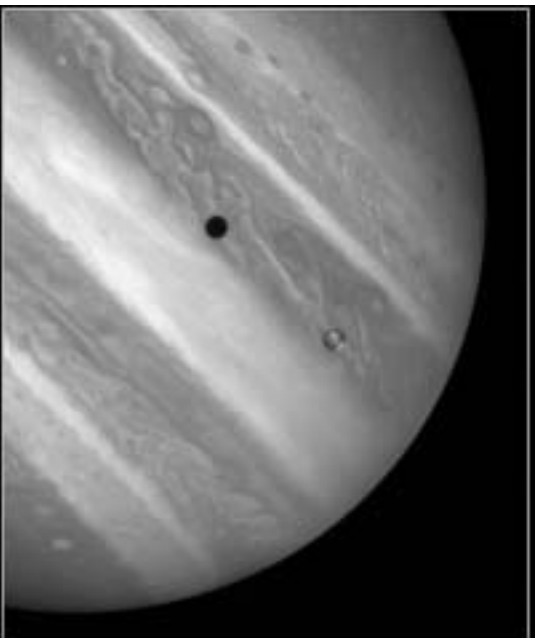
At last Yudistira came to Mount Meru, which is the doorway to heaven. And Indra the Lord of Past and Present appeared before him, and invited him to ascend. Yudistira bowed low and replied, "Very willingly I will do so, if I may bring my dog Svana with me." "That may not be," said Indra. "There is no place in heaven for dogs. Cast off this beast, and enter into eternal happiness." "I cannot do that," said Yudistira. "I do not wish for any happiness for which I must cast off so dear a companion."

"You traveled on without your four brothers," said Indra. "Why will you not ascend to heaven without this dog?" "My lord," replied Yudistira, "my brothers left me to follow the desires of their hearts. But Svana has given his heart to me; rather than renounce him I must renounce heaven." "You have spoken well," said Indra. "Come in, and bring your dog with you." So Yudistira and Svana ascended into paradise; and Indra, in recognition of their devotion to each other, set in the sky the constellation of the Great Dog, whose central star Sirius is the brightest of all in the heavens.

α Canis Majoris (a white hot main sequence star) also called "Sirius" has, in fact, the brightest apparent visual magnitude (-1.5) of any star in our sky. This is due more to proximity than absolute magnitude (a constructed number which compares all stars as they would appear 10 parsecs from Earth). The absolute magnitude of Sirius is 1.33. Sirius has a white dwarf companion, Sirius B (affectionately called the "pup") which is 10,000 times fainter. Sirius B has roughly the same mass as our sun, but is only 1/10 the size of the earth. So a 1 lb. bag of sugar transported to the "pup" would weigh 400,000 lbs., but still be the same size. As its separation increases to 9" over the next several years, the "pup" will be increasingly easier to split in amateur scopes.



**Hawaiian Astronomical Society
P.O. Box 17671
Honolulu, HI 96817**



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