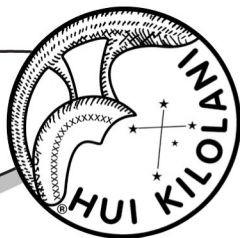


The Astronews



Volume 57, Issue 8

August 2009

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President's Message

by Chris Peterson

This year's mid-August Perseid meteor shower will have some interference from a Moon near last quarter that rises before the radiant on the night of the shower's peak, but Perseids are often bright enough to be seen under those conditions. They can also be seen for several days before and after the peak, so there will be some opportunity to see them in a dark sky after the peak.

While this shower has been observed for about 2000 years, we continue to learn more about this and other showers. It has been determined that Perseids originate from debris released by comet Swift-Tuttle. More recently, the history of previous passages of comets believed to be responsible for various showers have been examined. There has been some success in predicting when Earth would pass through a particularly dense debris field and would experience a higher-than-usual rate of meteor activity.

This process illustrates how the scientific method is used to advance knowledge in astronomy. First, phenomena are observed. Next, a hypothesis is formed that attempts to

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Upcoming Events:

- ☆ The next meeting is 7:30PM on **Tues., Aug. 4** at the Bishop Museum Planetarium.
- ☆ Bishop Museum's next planetarium show with **Barry Peckham** is Fri, **Aug. 21** at 7:00 p.m.
Mike Nassir from UH Dept. of Physics is subbing for Barry this month.
- ☆ The next Board Meeting is Sunday, **Aug. 2** at 3:30 p.m. at the POST building at UH.

Upcoming Star Parties

Club Party-Dillingham	Aug. 15
Public Party- Dillingham	Aug. 22
Kahala/Waikele Party	Aug. 29



Surprise Collision on Jupiter Captured by Gemini Telescope

(Story and image courtesy Gemini Observatory)

Jupiter is sporting a glowing bruise after getting unexpectedly whacked by a small solar system object, according to astronomers using the Gemini North telescope on Mauna Kea in Hawai'i. A spectacular new mid-infrared image is available at: www.gemini.edu/node/11300. (see image on page 7)

The new feature on Jupiter was first seen by Australian amateur astronomer Anthony Wesley on July 19th. The object that caused the impact scar could have been a small comet or asteroid. Using the SL9 impacts as a guide, the impacting object was probably just a few hundreds of meters in diameter. Such small bodies are nearly impossible to detect near or beyond Jupiter unless they reveal cometary activity, or, as in this case, make their presence known by impacting a giant planet. The impact site is dark in visible-wavelength images.

With the superb angular resolution of the Gemini observations, the data show the impact site in remarkable detail. "The structure of the impact site is eerily reminiscent of the larger Shoemaker-Levy 9 sites 15 years ago," remarked Heidi Hammel (Space Science Institute), who was part of the team that supported the effort at Gemini. In 1994, Hammel led the Hubble Space Telescope team that imaged Jupiter when it was pummeled by a shattered comet. "The morphology is suggestive of an arc-like structure in the feature's debris field," Hammel noted.

"We utilized the powerful mid-infrared capabilities of the Gemini telescope to record the impact's effect on Jupiter's upper atmosphere," said Imke de Pater (University of California, Berkeley). "At these wavelengths we receive thermal radiation (heat) from the planet's upper atmosphere. The impact site is clearly much warmer than its surroundings, as shown by our image taken at an infrared wavelength of 18 microns."

The Gemini images were obtained with

(Jupiter continued on page 7)

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The **Astronews** is a monthly newsletter of the Hawaiian Astronomical Society. Some of the contents may be copyrighted. We request that authors and artists be given credit for their work. Contributions are welcome. Send them to the Editor via email. The deadline is the 16th of each month. We are not responsible for unsolicited artwork.

President **Chris Peterson** called the July 7, 2009 meeting of the Hawaiian Astronomical Society to order at 7:34 p.m. The meeting was held at the Planetarium on the grounds of the Bishop Museum. There were thirteen members and twenty-one visitors in attendance.

Meeting Date – The General Membership Meetings for the Hawaiian Astronomical Society will continue to take place on the first Tuesday of each month at the Bishop Museum. Bishop Museum has given permission to the Hawaiian Astronomical Society to continue to hold meetings at the Bishop Museum Planetarium on the regular monthly basis.

Hawaii Space Lecture Series: The month of July at the Pacific Regional Planetary Data Center celebrates “Spaceweek 2009.” This month’s lecture will be “The History and Future of Lunar Exploration.” On July 21st, Dr. Jeff Taylor and Dr. Klaus Keil will offer a retrospective on the fortieth anniversary of the Apollo 11 manned moon flight and on the future of lunar exploration. Both gentlemen will speak in the NASA Pacific Regional Planetary Data Center, room 544, P.O.S.T. Bldg, on the grounds of the University of the Hawaii, Manoa. The free lecture begins at 7:30 p.m. Should you be interested in any upcoming lectures or for information you can contact NASA PRPDC at 808-056-3132 or on the Web go to <http://www.higp.hawaii.edu/prpdc> <<http://www.higp.hawaii.edu/prpdc>> .

FYI - H.A.S. President **Chris Peterson** briefly explained the ongoing Lunar Mission with the LRO and the LCROSS lunar impactor mission.

Permit Renewal – Treasurer **Jim MacDonald** has received the renewal of the use permit for Dillingham Airfield Transit area.

Bill Passed – Bill SB536, the Starlight Reserve or Statewide Lighting Law, has been signed by Governor Lingle. The Board of Directors are actively searching for a H.A.S. member to represent the interests and speak for the H.A.S. as a member of a state committee designated by the bill to look into and outline issues related to development of a Starlight Reserve. Anyone interested in participating in the committee please contact President Chris Peterson.

Ko’Olina – H.A.S. members **Steve Chun** and **Freddie Willems** participated in the recent Ko’Olina star show hosted by “Stars Above Hawaii.” The club received a donation of \$50 from “Stars Above Hawaii.”

School Star Parties – H.A.S. Star Party coordinator **Forrest Luke** reports that with state schools resuming classes in late July, we will again have star parties for public and private schools on O’ahu.

Forrest will pass around a sign-up sheet for astronomers at the August general membership meeting.

Up in the Sky - The club stepped outside the Planetarium at 8:10 p.m. to witness the passage of the International Space Station, traveling northwest to northeast. The ISS appeared on time as a very bright and rapidly moving object tripping across the evening sky.

Guest Speaker – Michael Chauvin, Ph.D., was guest speaker at this month’s general membership meeting. Dr. Chauvin’s thirty-minute presentation was titled “From Molokai to Machu Picchu- Hiram Bingham III and the Beginnings of Archaeoastronomy at the ‘Lost City’ of the Incas in Peru.” This was Dr. Chauvin’s premier offering of this subject in a public venue. Dr. Chauvin gave a short biographical overview of the life of Hiram Bingham III’s family and of the man himself. Dr. Chauvin spoke of the man’s upbringing, education and background in mathematics and astronomy. Dr. Chauvin recounted the rediscovery of Machu Picchu by Mr. Bingham. Dr. Chauvin identified the layout of architectural features of the city that over time Mr. Bingham increasingly viewed as astronomically significant, and

(Continued on page 7)

SARSAT to the Rescue

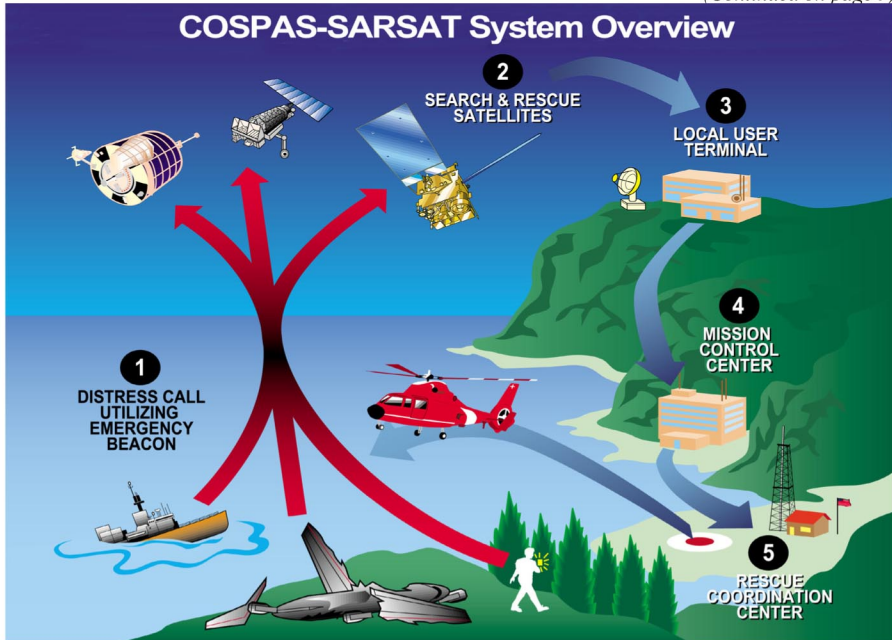
If a plane crashes in the woods and nobody hears it, does it make a sound?

Never mind contemplating this scenario as a philosophical riddle. This can be a real life or death question. And the answer most of the time is that, even if no people are nearby, something is indeed listening high above. That something is a network of satellites orbiting about 450 miles overhead. The “sound” they hear isn’t the crash itself, but a distress signal from a radio beacon carried by many modern ships, aircraft, and even individual people venturing into remote wildernesses.

In the last 25 years, more than 25,000 lives have been saved using the satellite response system called Search and Rescue Satellite-aided Tracking (SARSAT). So what are these life-saving superhero satellites? Why they are mild-mannered weather satellites.

“These satellites do double duty,” says Mickey Fitzmaurice, a National Oceanic and Atmospheric Administration (NOAA) systems engineer for SARSAT. “Their primary purpose is to gather continuous weather data, of course. But while they’re up there, they might as well be listening for distress signals too.” In February, NASA launched the newest of these Polar-orbiting Operational Environmental Satellites (or POES) into orbit. This new satellite, called N-Prime at launch and now dubbed NOAA-19, prevents a gap in this satellite network as another, aging NOAA satellite

(Continued on page 9)



NOAA's polar-orbiting and geostationary satellites, along with Russia's Cospas spacecraft, are part of the sophisticated, international Search and Rescue Satellite-Aided Tracking System.



NIGHT SKY NETWORK NEWS

by John Gallagher

Mark your calendar for another IYA 2009 Teleconference on Thursday, August 27, 2009 with Brian Day discussing the LCROSS Mission. Teleconference begins at 3:00 pm (local time). Contact Night Sky Network Coordinator, John Gallagher, 683-0118 for details on downloading the power point presentation. Details are also posted on the HAS Yahoo Group Calendar.



Lighting Laws Update

by John Gallagher

Great news – The Governor has signed SB 536 Relating to Starlight Reserve aka Statewide Lighting Law to address Light Pollution. For club members who answered the call to submit testimony in support of the bill – a Big Mahalo. Your efforts paid off. As the bill made its way through various committees in both the State House and Senate, it was nip and tuck. Once approved by the legislature, it was submitted to the Governor on May 7, 2009. The delay in the Governor's approval caused concern. Another plea went out to let the Governor know that the citizens of the State wanted this bill enacted. That was the defining action and the bill was signed on June 29, 2009 as Act 161.

In the March 2009 issue of the ASTRONEWS, information was provided on the original Bill; however, several changes have been made. The Hawaiian Astronomical Society (HAS) has been added as a member of the temporary Advisory Committee. This committee will provide suggested details how to implement the program to the next legislative session in 2010.

In the original Bill, specifics on the mechanics of implementing the three zones: Core, Buffer, and External have been deleted; however, these zones are still in the current Bill without the specific details. In a sense, the deleted material closely parallels what the Advisory Committee should be suggesting. If you're interested in reviewing the Bill, instructions provided in the March 2009 ASTRONEWS are still basically correct. If you go to the web page, the current Bill is SB 536 CD1. Earlier bills are also listed.

This Bill lays the ground work to put the State of Hawaii on course to address light pollution on a statewide basis and is probably the first in the nation to do so. Many communities have such ordinances. Based on input from the Advisory Committee, a new comprehensive Bill will be developed in the next legislative session. In other words we are still in the woods. The battle has just begun. Club members are encouraged to become familiar with SB 536 and be prepared to take an active part to ensure success. There will be some tough fights from individuals who are not knowledgeable with the effects of light pollution. Many feel that the more outside lighting, the less burglaries. Did you know that burglars do not like the dark? Glare from lights can make it more difficult for you to see. The police want light to enable them to see more clearly different colors. Did you know there are special lights that provide good color rendition without causing light pollution? Do we really need street lights along all highways? What are car lights for? Intersections and critical areas – yes. Club members should visit the International Dark Sky Organization (www.ids.org) and learn the

(Lighting Laws continued on page 11)

Planets Close To the Moon










Times are Hawaii Standard Time

- Aug 6, 09h**, M 3.1° NNW of Jupiter
(171° from sun in midnight sky)
- Aug 6, 14h**, M 2.7° NNW of Neptune
(169° from sun in morning sky)
- Aug 9, 02h**, M 5.1° NNW of Uranus
(141° from sun in morning sky)
- Aug 15, 17h**, M 3.2° N of Mars
(59° from sun in morning sky)
- Aug 17, 12h**, M 1.7° NNE of Venus
(35° from sun in morning sky)
- Aug 21, 15h**, M 6.1° SSW of Saturn
(23° from sun in evening sky)
- Aug 21, 23h**, M 2.6° SSW of Mercury
(27° from sun in evening sky)

Other Events of Interest

Times are Hawaii Standard Time

- Aug 5, 14:55h**, Moon Full
- Aug 12, Perseid Meteors**
- Aug 14, Jupiter at Opposition** (*See Meteor Log*)
- Aug 16h**, Mercury 2.9° SSW of Saturn
(26° from sun in evening sky)
- Aug 17, 11h, Neptune at Opposition**
- Aug 20, 00:01h**, Moon New
- Aug 24, 06h**, Mercury at greatest elongation
(27.4° East of the sun in evening sky)
- Aug 25, 04h**, Vesta 0.49° N of Venus
(34° from sun in morning sky)

 Mercury Visible low in the west after sunset during most of August. Very close to Saturn on Aug 16.	 Venus About 35° from the sun and dominates the morning sky.	 Mars Above Venus in the pre-dawn sky, moving from Taurus to Gemini.
 Jupiter Reaches opposition on Aug. 14 and is in the sky all night. Best observed near midnight.	 Saturn Visible in the SW before sunset but is quite low in the sky.	 Uranus between Venus and Mars in the morning sky.
 Neptune Reaches opposition on Aug 14 and is close to Jupiter.	 Dwarf Planet Pluto Reached opposition in June. Is well placed for viewing in the evening sky near M23.	 Asteroid Juno Visible in the morning sky in Pisces and will reach opposition next month.

(Minutes continued from page 3)

marked the development of the explorer's writings over time. Dr. Chauvin assured those present that his upcoming book "From Polynesia to Peru: Hiram Bingham III and the Beginning of Archaeoastronomy at Machu Picchu" will give a fuller account of the aspects of Hiram Bingham III's life and work.

Travis Le, H.A.S. member and visual astronomer, who recently won third place at the Hawaii State Science and Technology Fair and traveled to participated in the 2009 Intel International Science and Engineering Fair (ISEF) in Reno Nevada, will present his project to the club at the September Meeting.

Science Café- **Carolyn Kaichi** reports that the Science Café is on hiatus and will hopefully resume in September. Stay tune for more information.

As there was no further business, the meeting was adjourned at 9:04 p.m.

Refreshments were served.

Respectfully Submitted,
Gretchen West
HAS Secretary



(Jupiter continued from page 2)

the MICHELLE spectrograph/imager, yielding a series of images at 7 different mid-infrared wavelengths. Two of the images (8.7 and 9.7 microns) were combined into a color composite image by Travis Rector at the University of Alaska, Anchorage to create the final false-color image. By using the full set of Gemini images taken over a range of wavelengths from 8 to 18 microns, the team will be able to disentangle the effects of temperature, ammonia abundance, and upper atmospheric aerosol content. Comparing these Gemini observations with past and future images will permit the team to study the evolution of features as Jupiter's strong winds disperse them.

"The Gemini support staff made a heroic effort to get these data," said de Pater. "We were on the telescope observing within 24 hours of contacting the observatory." Because of the transient nature of this event, the telescope was scheduled as a "Target of Opportunity" and required staff to react quickly to the request.

The Gemini Observatory is an international collaboration with two identical 8-meter telescopes. The Frederick C. Gillett Gemini Telescope is located at Mauna Kea, Hawai'i (Gemini North) and the other telescope at Cerro Pachón in central Chile (Gemini South), and hence provide full coverage of both hemispheres of the sky. Both telescopes incorporate new technologies that allow large, relatively thin mirrors under active control to collect and focus both optical and infrared radiation from space. ☆



Photo Credit:
Imke de Pater
(UC Berkeley),
Heidi B. Hammel
(Space Science
Institute),
Travis Rector
(University of
Alaska Anchorage),
Gemini Observa-
tory/AURA

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Week 31	26	27	28	29 South Delta-Aquarids Meteor Shower Peak	30	31	1 Alpha Capricornids Meteor Shower Peak
Week 32	2	3	4 Comet 22P/Kopff Closest Approach To Earth (0.775 AU) M 12.7* 7:30p HAS Meeting	5 Asteroid 16 Psyche At Opposition (9.3 Magnitude)	6 Full Moon	7	8
Week 33	9 Comet 24P/Schaumasse Perihelion (1.214 AU) M 10.41	10	11	12 Perseids Meteor Shower Peak	13 Comet P/2004 X1 (LINEAR) Near-Earth Flyby (0.194 AU) M 15.4	14 Jupiter At Opposition M -2.9	15 Dillingham Club Star Party
Week 34	16	17 Neptune At Opposition M 7.8	18 Conjunction: Mercury, Saturn	19	20 New Moon	21 Asteroid 88 Thisbe At Opposition (9.8 Magnitude)	22 Dillingham Public Star Party
Week 35	23	24 Mercury At Its Greatest Eastern Elongation (27 Degrees) M 0.2	25 For more events look here. Northern Iota Aquarids Meteor Shower Peak	26	27 3p LCROSS Mission	28 7p Niu Valley Middle School	29 Kahala/Waialeale Public Star Party
Week 36	30	31	1 25-6 Alpha Aurigids (AUR) 7:30p HAS Meeting	2	3	4 Full Moon Saturn's Rings Edge-on From Earth M 1.1	5

HAS Yahoo Group

<http://tech.groups.yahoo.com/group/HawaiianAstronomicalSociety/>

reached the end of its operational life. “The launch of N-Prime was a big deal for us,” Fitzmaurice says. With N-Prime/NOAA-19 in place, there are now six satellites in this network. Amongst them, they pass over every place on Earth, on average, about once an hour. To pinpoint the location of an injured explorer, a sinking ship, or a downed plane, POES use the same Doppler effect that causes a car horn to sound higher-pitched when the car is moving toward you than it sounds after it passes by.

In a similar way, POES “hear” a higher frequency when they’re moving toward the source of the distress signal, and a lower frequency when they’ve already passed overhead. It takes only three distress-signal bursts — each about 50 seconds apart — to determine the source’s location. Complementing the POES are the Geostationary Operational Environmental Satellites (GOES), which, besides providing weather data, continuously monitor the Western Hemisphere for distress signals. Since their geostationary orbit leaves them motionless with respect to Earth below, there is no Doppler effect to pinpoint location. However, they do provide near instantaneous notification of distress signals.

In the future, the network will be expanded by putting receivers on new Global Positioning System (GPS) satellites, Fitzmaurice says. “We want to be able to locate you after just one burst.” With GPS, GOES will also be able to provide the location of the transmitter.

Philosophers beware: SARSAT is making “silent crashes” a thing of the past.

Download a two-page summary of NOAA-19 at www.osd.noaa.gov/POES/NOAA-NP_Fact_Sheet.pdf. The Space Place gives kids a chance to rescue stranded skiers using their emergency rescue beacons. The Wild Weather Adventure game awaits them at spaceplace.nasa.gov/en/kids/goes/wwa.

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

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Meteor Log - August 2009

by Mike Morrow

This is **Perseid month** in the northern hemisphere. There is a bright Moon but some interesting activity may occur:

Wednesday the 12th, Radiant 03h16m, +58 deg. Rates could be between 50-75 an hour. There have been times when the rates have been above 100 to 175 an hour. This year the maximum will be between about 7 and 10 AM so rates will be near the lower numbers. Perseids are fast, often bright, and frequently leave persistent trains.

Monday the 17th, **Kappa Cygnids**. Radiant 19h04m +59 deg. Rates are less than 3 an hour. This minor drizzle is a source of slow-moving, sometimes brilliant meteors. The radiant is high above the horizon all night.

If you are interested in observing meteors contact **Tom Giguere** at 672-6677, or write **Mike Morrow**, P.O. Box 6692, Ocean View, Hawaii 96737

HAS Financial Report for the month ending as of July 15, 2009

Initial Balance:	\$4,361.56
<i>Receipts:</i>	
Dues Received	186.00
Donations	70.00
Magazine Payment	100.95
T-Shirt Sales	15.00
Total Income:	\$371.95
<i>Expenses:</i>	
Astronews	161.98
Magazine Subscription	34.00
Postage	
Total Expenses:	\$195.98
Final Balance	\$4,537.53

There are two new members this month. They are *Nancy Ali* and *Patrick Boyce*. A special thanks to the *Stars Above Hawaii* and *Gregory Ha* for their donations. Thanks and clear skies to all renewing their membership during the month.

Upcoming School Star Parties

Fri.	8/28	Niu Valley Middle School
Fri.	9/25	Mililani Uka (includes dinner before event)
Fri.	10/23	Hickam Elementary (tentative)
Fri.	11/20	Leihoku Elementary - Waianae

If you are interested in helping out at a school star party, sign up at the HAS meeting or contact the star party coordinator, FORREST LUKE at 623-9830 or lukef003@hawaii.

(President continued from page 1)

explain the observations. Finally, more observations are taken to confirm or reject predictions derived from the hypothesis.

In this International Year of Astronomy, we celebrate 400 years of the use of telescopes. While technological advances provide opportunities for making new and improved observations, that is only part of what is necessary to advance knowledge. Intellectual effort must be expended to understand the observations. This can range from the trivial, such as Galileo's observation that the Moon's surface is rough, not smooth, to Einstein's theories of relativity.

In the case of meteor showers, many steps were necessary to bring us to our current level of understanding. First, it was necessary to understand that meteors are caused by objects entering Earth's atmosphere from space. Next, particular comets or other bodies were identified as the source of particular showers. Finally, improved computing power and theoretical modeling allowed us to pinpoint particularly favorable passages through debris from a specific orbit.

Successful predictions are gratifying. However, sometimes more is learned when a hypothesis fails. This forces a reexamination of the question, and great leaps in understanding can occur as a result.

Chris 

● ————— ●
(Lighting Laws continued from page 5)

facts so you can be prepared to challenge those who want to destroy the night sky for all of us. Here are some positive points to keep in mind:

- a. Long range cost savings to the State and Counties.
- b. Potential to increase tourism as premier location for viewing the night sky.
- c. Protect our endangered wildlife.
- d. Preserve the night sky for scientific and astronomical studies.
- e. Protect the long range health of our citizens.
- f. Provide for cultural activities associated with dark skies.

In case your wondering about the name for SB 536 as being "Starlight Reserve," the Bill provides for the following "Starlight Reserve Areas:"

- a. Starlight Heritage Site
- b. Starlight Astronomy Site
- c. Starlight Natural Site
- d. Starlight Landscape
- e. Starlight Oasis-human Habitat
- f. Mixed Starlight Site (Combination of two or more of the above)

**Within each of these areas, it is anticipated there will be a core, buffer, and an external zone as previously mentioned.

Recently, the American Medical Association in their annual conference came out in support of the need to reduce light pollution due to its effects on our health. On July 30, 2008, several members of Congress signed a letter addressed to the Environmental Protection Agency to look in on the problem of light pollution and the steps being taken to combat it.

Hopefully, the club's Representative on the Temporary Advisory Committee will provide feedback on suggestions being developed for next year's legislative action. Club members who have suggestions or ideas are encouraged to let our club Representative know. ☆

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Partial solar eclipse over Hawaii 21 July 09 by Freddy Willems - taken
with a Orion 80mm $f/7.5$ refractor
Camera used Canon 10D unmodified with focal reducer $f/6.3$. Exposure
time 1/500 ISO 200

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without proper
postage

