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Journal of the Association of Lunar & Planetary Observers

The Strolling Astronomer

Volume 52, Number 4, Autumn 2010

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Founded in 1947

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- ***Jack Horkheimer passes way***
- ***Index to JALPO Volume 51 (2009)***
- ***ALPO 2010 Conference wrap-up***
- ***Apparition reports: Mercury in 2008, Jupiter in 2007 and Uranus-Neptune in 2010***

. . . plus reports about your ALPO section activities and much, much more!

Wide-angle image during Perseids by Pierre Martin of Ottawa, Canada from individual frames taken on August 13, 2010. Pierre was using a Canon 5DmkII camera, ISO 1250 and 16-35mm lens (set at 16mm f/2.8). Over the course of the entire night, this field of view captured 38 meteors. The brightest meteors on this composite are magnitude -5 and -3. This image created by Pierre Martin.

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M8 (Lagoon Nebula), M20 (Trifid Nebula) and NGC 6559 *– Taken with the Orion Parsec 8300C, Orion ED80T CF Refractor, Orion Sirius EQ-G, Orion StarShoot AutoGuider and Orion 100mm f/6 Refractor. Orion Image.*

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Journal of the Association of Lunar & Planetary Observers

The Strolling Astronomer

Volume 52, No. 4, Autumn 2010
This issue published in September 2010 for distribution in both portable document format (pdf) and also hardcopy format.

This publication is the official journal of the Association of Lunar & Planetary Observers (ALPO).

The purpose of this journal is to share observation reports, opinions, and other news from ALPO members with other members and the professional astronomical community.

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http://www.alpo-astronomy.org

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Point of View
A Lighthearted Discussion: Marriage and Astronomy

By Theo Ramakers, ALPO member, and happily married to an understanding wife

Lucky are those of us with an understanding spouse who supports us in our astronomy hobby. We don't think much about what our hobby would be like if that were not the case. A recent exchange of e-mails on our club's listserve and private e-mails of our chapter members (as an outpouring of jokes) made me think about this.

First and foremost, I start by apologizing for the curved brainwaves of my buddies. But like I said, please take these as jokes.

The story starts when one new member posted the news that he had purchased a new scope and apologized for the currently bad weather that resulted because of that purchase. (No mention of the wife yet.) A follow-up e-mail complained about the so-so result of his first image, and mentioned that maybe he'd get better at it either after the growing pains wore off if his wife would let him get a really nice camera. (Here comes the wife part.)

It did not take long for others to chime in and proclaim that because I myself got them interested in imaging, that I was the cause of their troubles with their wives. One guy proclaimed that he had to make up for buying an SBIG camera by getting his wife a motorcycle — obviously my fault.

In the meantime, the first buddy continued his saga by letting us know that his wife would leave him if he were to continue his nightly imaging sessions at 4 in the morning; he concluded that he would miss her very much, but (tongue-in-cheek) in planning ahead, he would put an ad on a dating website that would go something like this: "Wanted: Female who enjoys astronomy and imaging. Must also have a 10 inch or larger telescope with imaging equipment. Send picture of scope and gear".

Feeling guilty for causing these problems, I suggested that he buy his wife a motorcycle too, so she could team up with my buddy No. 1's wife for joint motorcycle rides. These ads fueled the wild ideas in the manly brains of others, so other suggestions came in. Two pretty extreme examples were to change the ad to: "Looking for girl who will set up my telescope and imaging gear, then will go in the house and make me dinner, then clean the house, bring me a cold beer and wash the car" and "Build a room in the attic or another garage where your wife won't go, so you can keep the secretly bought equipment".

However, you have to pay attention that you not back yourself into a corner if you tried to assemble a 20-inch DOB it in the driveway. But the trailer you needed to transport it could be justified: "Oh honey, the trailer? Yeah, that's so you can take your motorcycle to places if you don't want to drive it far for riding."

So, my friends, if you listen to my buddies and get into situations like these, there are techniques and secrets that many club members are willing to share with you. However if you do get kicked out of the house because of this hobby, we won't let you move in, but we will go to the observing field with you.

Better yet, keep a good relationship with your spouse so you DON'T have to listen to advice like this from your friends.

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News of General Interest

Jack Horkheimer: 1938 - 2010

Legendary and wildly popular Jack Horkheimer, know far and wide for his tireless efforts to bring astronomy to the masses passed away on August 20, 2010, apparently of respiratory illness which he battled for many, many years; the illness kept him from pursuing athletics years earlier.

Says ALPO member William Mellberg in a posting to fellow ALPO member Rik Hill on the ALPO-Member-Discussion e-mail list: "I've known a few people over the years who'd complain about Jack's programs, calling them silly. Likewise, I've seen a few letters to the editors of various astronomy publications echoing the same sentiment.

"But I'd always remind those people that Jack's shows weren't targeted at them . . . they were written for average television viewers (average PBS television viewers, that is.) And in that regard, I thought Jack's weekly reviews of stellar events were outstanding. Indeed, there were many times when he reminded me to go outside and look at something. I, for one, will miss his clever presentations. I thoroughly enjoyed them.

"And as you suggested, Horkheimer undoubtedly introduced countless newcomers (young AND old) to astronomy. In an age when some people might be turned away from astronomy because it appears too hi-tech, Horkheimer reminded us that one doesn't need a high-priced telescope to enjoy the heavens. All one really needs are a pair of Mk.1 human eyeballs (and maybe a pair of binoculars, too)."

For more on Mr. Horkheimer's passing, go to either of the following:

- http://www.miamiherald.com/2010/08/20/1785712/star-gazer-connected-us-to-the.html
- http://www.skyandtelescope.com/community/skyblog/newsblog/101194934.html

Close Call for Earth and Two Very Minor Planets

Two asteroids whizzed past Earth on September 8, reminding some that our advance notice of these objects is minimal at best.

Asteroid 2010 RX30 (estimated by NASA to be between 32 and 65 feet across) sped by within 154,000 miles of Earth at 09:51 UT and asteroid 2010 RF12 (estimated at 20 to 45 feet across) passed within 49,000 miles at 21:12 UT on that date.

Both objects had been discovered the previous Sunday - only three days before their time of closest approach.

ALPO Interest Section Reports

Web Services

Larry Owens, Section Coordinator

Larry.Owens@alpo-astronomy.org

(NEW) -- If you haven't visited the ALPO website lately, now is a good time. We've made numerous changes, including new features for the ALPO home page, the implementation of a standardized section page with "blog" and we've linked all of our section websites to a new ALPO account on the social networking sites, Twitter, FaceBook and MySpace.

When you visit our home page now, you may notice one of your images on the site! In addition to our ALPOD (ALPO Picture of the Day), we've added a gallery widget that presents a random thumbnail image, taken from section galleries and from images posted to many of our ALPO Yahoo groups. The home page also has an expanded set of links, including a section listing all of the ALPO-sponsored Yahoo groups.

You can now follow ALPO observing section alerts on your mobile phone, too! Thanks to social networking, this and many other features are available now. Whenever a section coordinator posts an alert or an update to a newsletter, a "tweet" is automatically posted to Twitter, an update appears on our FaceBook "wall", and our MySpace blog is updated. The result is that you now have a single place to look for posts from all of our sections, either through your mobile phone, or on your favorite social network. Send the text message "follow ALPOastronomy" to "40404" to get updates by mobile phone.

Follow us on Twitter, become our friend on FaceBook, or join us on MySpace.

Section Coordinators: If you need an ID for your section's blog, contact Larry Owens at larry.owens@alpo-astronomy.org

For details on all of the above, visit the ALPO home page online at www.alpo-astronomy.org

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Computing Section

Larry Owens,
Section Coordinator,
Larry.Owens@alpo-astronomy.org

Important links:

- To subscribe to the ALPOCS yahoo e-mail list, http://groups.yahoo.com/group/alpocs/
- To post messages (either on the site or via your e-mail program), alpocs@yahoogroups.com.
- To unsubscribe to the ALPOCS yahoo e-mail list, alpocs-unsubscribe@yahoogroups.com
- Visit the ALPO Computing Section online at www.alpo-astronomy.org/computing.

Lunar & Planetary Training Program

Tim Robertson,
Section Coordinator
cometman@cometman.net

The ALPO Lunar & Planetary Training Program currently has 0 active students. In the past 12 months we have had orders for 14 copies of the *Novice Observers Handbook*.

The ALPO Training Program is a two-step program and there is no time requirement for completing the steps. But I have seen that those students that are motivated usually complete the steps in a short amount of time. The motivation comes from the desire to improve their observing skills and contribute to the pages of the Journal of the ALPO.

The Lunar & Planetary Training Program is open to all members of the ALPO, beginner as well as the expert observer. The goal is to help make members proficient observers. The ALPO revolves around the submission of astronomical observations of members for the purposes of scientific research. Therefore, it is the responsibility of our organization to guide prospective contributors toward a productive and meaningful scientific observation.

The course of instruction for the Training Program is two-tiered. The first tier is known as the "Basic Level" and includes reading the ALPO's *Novice Observers Handbook* and mastering the fundamentals of observing. These fundamentals include performing simple calculations and understanding observing techniques.

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When the student has successfully demonstrated these skills, he or she can advance to the "Novice Level" for further training where one can specialize in one or more areas of study. This includes obtaining and reading handbooks for specific lunar and planetary subjects. The novice then continues to learn and refine upon observing techniques specific to his or her area of study and is assigned to a tutor to monitor the novice's progress in the Novice Level of the program.

When the novice has mastered this final phase of the program, that person can then be certified to "Observer Status" for that particular field.

For information on the ALPO Lunar & Planetary Training Program, go to www.cometman.net/alpo/; regular postal mail to Tim Robertson, 195 Tierra Rejada Rd. #148, Simi Valley CA, 93065; e-mail to cometman@cometman.net

ALPO Observing Section Reports

Eclipse Section

Mike Reynolds, section Coordinator
alpo-reynolds@comcast.net

Please visit the ALPO Eclipse Section online at www.alpo-astronomy.org/eclipse.

Comets Section

Gary Kronk,
acting Section Coordinator
kronk@cometography.com

The best comet that has so far appeared during 2010 is C2009 R1 (McNaught). Only two ALPO observers have so far reported observations and these were obtained during June before the comet entered morning twilight. The comet failed to live up to expectations, as its rate of brightening slowed dramatically during the first half of June.

Comet 103P/Hartley 2 continues at this time (mid-August) to brighten and should be an easy target for visual and photographic observers. The comet will pass 0.12 AU from Earth on October 20 and will be closest to the Sun on October 28. Its direct motion will keep it relatively close to Earth for several weeks so that it could remain between magnitude 5 and 6 throughout October and the first half of November.

For detailed data on both of these comets and much more, go to http://cometchasing.skyhound.com/

Visit the ALPO Comets Section online at www.alpo-astronomy.org/comet.

Meteors Section

Report by Bob Lundsford,
Section Coordinator
lunro.imo.usa@cox.net

The ALPO Meteors Section website has been recognized by the ALPO webmaster Larry Owens as having one of the most organized and up-to-date websites among the ALPO sections. This is high praise indeed, well worth the efforts to provide the web site as a useful tool for meteor observers.

We continue to receive reports of an impressive Perseid display from the August event. Details on this will be reported in the next issue of this Journal.

Visit the ALPO Meteors Section online at www.alpo-astronomy.org/meteorblog/ Be sure to click on the link to viewing meteors, meteor shower calendar and references.

Meteorites Section

Dolores Hill, Section Coordinator
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The ALPO Meteorite Section continues to provide information to those who think they have found a meteorite. We also inform people on the difference between "identification" as a meteorite and "classification". The latter results in an officially recognized name in the scientific literature.

The last year or so has seen some spectacular new meteorite falls *and recoveries* throughout the world. Consistent with known meteorite fall statistics, they are "ordinary chondrites" of different chemical and petrological classes that represent a variety of metamorphic conditions on their parent asteroids: Ash Creek, Texas (L6), Jesenice, Slovenia (L6); Whetstone Mountains, Arizona

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(H5); Grimsby, Ontario (H5); "Virginia" (type?); "Wisconsin" (type?). The last two falls are pending official approval by the Nomenclature Committee of the Meteoritical Society. All of these recoveries benefitted from careful, accurate observations of the incoming fireball trajectories and quick on-the-ground searches by locals and experienced meteorite hunters.

In future JALPOs, we hope to bring education and public outreach ideas to those who have meteorite collections and helpful hints to those who would like to find or own a meteorite. We may highlight a meteorite question or feature that collectors can investigate in their own collections. This will encourage professional-amateur collaborations. You may discover an interesting inclusion or have a piece of a meteorite that would assist a particular scientific investigation.

For instance, we had a researcher in our lab that was looking for grungy, weathered schreibersite ($FeNi_3P$) inclusions in iron meteorites because he was studying terrestrial chemical reactions and their kinetics. His chosen technique was nondestructive, so he returned the samples intact.

A special thanks goes out to Larry Owens who set up a new website and social networking for the ALPO Meteorites Section. We plan to move over to that site soon! In the meantime, ALPO members are welcome to contact me at dhill@lpl.arizona.edu with "ALPO Meteorite Section" in the subject line.

Visit the ALPO Meteorite Section online at www.alpo-astronomy.org/meteorite/

Solar Section

Kim Hay, Section Coordinator,
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Cycle 24 started off slow, but has been increasing in activity over the last several months. There have been many observations, sketches and images submitted to the Solar Section for archiving. For up-to-date images from solar observers visit http://tech.groups.yahoo.com/group/Solar-ALPO/. Also remember to visit the new Solar Section blog at www.alpo-astronomy.org/solarblog for updated news.

If you are interested in the Sun and imaging, please send in your images with the correct information required for archiving which is located on the website under the Guidelines.

Observing is not only for nighttime. Observe the Sun during the day and the dynamic changes that take place.

For information on solar observing – including the various observing forms and information on completing them – go to www.alpo-astronomy.org/solar

Mercury Section

Report by Frank J. Melillo, Section Coordinator
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When 2010 began, it was a slow start for the Mercury section. But during the springtime evening apparition, many old-timers got back to observing Mercury again. Many of them learned to use the webcams as they contributed high quality observations to the section.

At the Stellafane star party, I had an opportunity to meet Bill Sheehan, a psychiatrist, an author and an amateur astronomer. During the Technical Talks hour, Bill gave an excellent presentation on "Schiaparelli's Classic Study of Mercury in the Light of CCD Imagery." He pointed out that the original drawings recorded in Schiaparelli's observer logs in the light of CCD images obtained under the nearly identical observing conditions.

Also, John Boudreau spoke briefly about his Mercury images along with Bill Sheehan. John's images are comparable with Shiaparelli's drawings and Bill set himself to resolve the features on Mercury's surface by using their observations.

Bill Sheehan during his presentation on "Schiaparelli's classic study of Mercury in the light of CCD imagery" at Stellafane 2010. (Photo by Frank Melillo.)

Visit the ALPO Mercury Section online at www.alpo-astronomy.org/mercury.

Venus Section

Report by Julius Benton, Section Coordinator
jlbaina@msn.com

Venus is in the West after sunset as the 2010 Eastern (Evening) Apparition progresses. Venus is passing through its waning phases (a progression from fully illuminated through crescentic phases). At the time of this report (mid-August), the disk of Venus is about 21.7 arc-seconds across and 54.4% illuminated, having reached dichotomy on August 17 followed by Greatest Elongation East on August 20.

A month later, on September 24, Venus will reach greatest brilliancy at visual magnitude -4.7.

During the 2010 Eastern (Evening) Apparition, observers are witnessing the leading hemisphere of Venus at the time

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of sunset on Earth. The table of Geocentric Phenomena in Universal Time (UT) is presented for the convenience of observers for the 2010 Eastern (Evening) Apparition as well as for the forthcoming 2010-11 Western (Morning) Apparition for planning purposes:

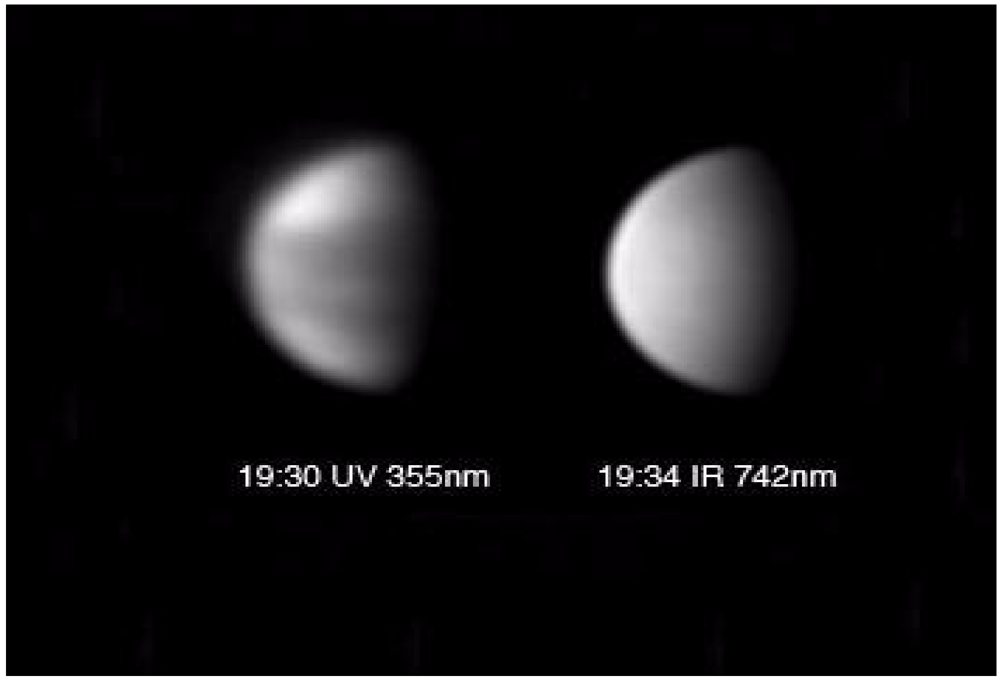
So far this apparition, observers have submitted over 100 drawings and digital images. Readers are reminded that high-quality digital images of the planet taken in the near-UV and near-IR, as well as other wavelengths through polarizing filters, continue to be needed by the Venus Express (VEX) mission, which started systematically monitoring Venus at UV, visible (IL) and IR wavelengths back in May 2006. This Professional-Amateur (Pro-Am) effort continues, and observers should submit images to the ALPO Venus Section as well as to the VEX website at:

http://sci.esa.int/science-e/www/object/index.cfm?fobjectid=38833&fbodylongid=1856.

Regular Venus program activities (including drawings of Venus in Integrated Light and with color filters of known transmission) are also valuable throughout the period that VEX is observing the planet, which continues into 2010. Since Venus has a high surface brightness, it is potentially observable anytime it is far enough from the Sun to be safely observed.

The observation programs conducted by the ALPO Venus Saturn Section are listed on the Venus page of the ALPO website at *http://www.alpo-astronomy.org/venusblog/* as well as in considerable detail in the author's ALPO Venus Handbook available from the ALPO Venus Section. Observers are urged to carry out digital imaging of Venus at the same time that others are imaging or making visual drawings of the planet (i.e., simultaneous observations).

Although regular imaging of Venus in UV, IR and other wavelengths is extremely important and highly encouraged, far too many experienced observers have neglected making visual numerical relative intensity estimates and reporting visual or color filter impressions of features seen or suspected in the atmosphere of the planet (e.g., categorization of dusky atmospheric markings, visibility of cusp caps and cusp bands, measurement of cusp extensions,



David Arditti of Middlesex, UK, submitted excellent UV and IR images of Venus on July 9, 2010, at 19:30UT (UV at 355nm) and 19:34UT (IR at 742nm) using a 35.6 cm (14.0 in.) SCT. Banded dusky features are particularly obvious in the UV image. Apparent diameter of Venus is 16.5", phase (k) 0.678 (67.8% illuminated), and visual magnitude -4.0. South is at top of image.

Geocentric Phenomena of the 2010 Eastern (Evening) Apparition of Venus in Universal Time (UT)

Superior Conjunction	2010	Jan 11 (angular diameter = 9.8 arc-seconds)
Predicted Dichotomy	2010	Aug 17.64 (exactly half-phase)
Greatest Elongation East	2010	Aug 20 (46º east of the Sun)
Greatest Brilliancy	2010	Sept 24 (m_v = – 4.7)
Inferior Conjunction	2010	Oct 19 (angular diameter = 58.3 arc-seconds)

Geocentric Phenomena of the 2010-11 Western (Morning) Apparition of Venus in Universal Time (UT)

Inferior Conjunction	2010	Oct 19 (angular diameter = 58.3 arc-seconds)
Greatest Brilliancy	2010	Dec 04 (m_v = – 4.9)
Greatest Elongation West	2011	Jan 08 (47º east of the Sun)
Predicted Dichotomy	2011	Jan 08.28 (exactly half-phase)
Superior Conjunction	2011	Aug 16 (angular diameter = 9.6 arc-seconds)

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monitoring for the Schröter phase effect near the date of predicted dichotomy, and looking for terminator irregularities).

Routine use of the standard ALPO Venus observing forms will help observers know what needs to be reported in addition to supporting information such as telescope aperture and type, UT date and time, magnifications and filters used, seeing and transparency conditions, etc.

ALPO Venus Section urges interested readers worldwide to join us in our projects and challenges ahead.

The ALPO Venus Section encourages interested readers worldwide to join us in our projects and challenges ahead.

Individuals interested in participating in the programs of the ALPO Venus Section are encouraged to visit the ALPO Venus Section online *http://www.alpo-astronomy.org/venusblog/*.

Lunar Section:

Lunar Topographical Studies / Selected Areas Program

Report by Wayne Bailey, Program Coordinator
wayne.bailey@alpo-astronomy.org

During this quarter, the ALPO Lunar Topographical Studies Section (ALPO LTSS) received a total of 145 new observations from 10 observers. In addition, three lunar-related presentations were given at the 2010 ALPO Conference.

"Focus On" features in *The Lunar Observer* continued with an article on Dark-Haloed Craters. Future subjects include the Mare Nectaris basin, Milichius-T. Mayer area and Marius-Reiner Gamma. Four contributed articles were published, and 10 observations included extensive comments, a trend that I hope will continue to grow.

Visit the following online web sites for more info:

- The Moon-Wiki: *the-moon.wikispaces.com/Introduction*
- ALPO Lunar Topographical Studies Section *moon.scopesandscapes.com/alpo-topo*
- ALPO Lunar Selected Areas Program *moon.scopesandscapes.com/alpo-sap.html*
- ALPO Lunar Topographical Studies Smart-Impact WebPage *moon.scopesandscapes.com/alpo-smartimpact*
- The Lunar Observer (current issue) *moon.scopesandscapes.com/tlo.pdf*
- The Lunar Observer (back issues) *moon.scopesandscapes.com/tlo_back.html*
- Selected Areas Program: *moon.scopesandscapes.com/alpo-sap.html*
- Banded Craters Program: *moon.scopesandscapes.com/alpo-bcp.html*

Lunar Domes Survey

Marvin Huddleston, FRAS, Program Coordinator
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Visit the ALPO Lunar Domes Survey on the World Wide Web at *www.geocities.com/kc5lei/lunar_dome.html*

Lunar Meteoritic Impacts

Brian Cudnik, Program Coordinator
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Please visit the ALPO Lunar Meteoritic Impact Search site online at *www.alpo-astronomy.org/lunar/lunimpacts.htm*.

Support the ALPO with an Orion Purchase

Those planning to purchase any item via the Orion website can at the same time have their purchase result in a small contribution to the ALPO. Simply visit our web-site at *www.alpo-astonomy.org* and click on any of the Orion-sponsored banners shown here before completing your purchase (within 30 days).

We ask all who are considering an online purchase of Orion astronomical merchan-

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Lunar Calendar, October thru December 2010
(All times UT; Geocentric Data)

Oct. 01	03:52	Last Quarter°
Oct. 06	13:42	Moon at Perigee (359,452 km - 223,353 miles)
Oct. 07	05:00	Moon 6.7° SSW of Mercury
Oct. 07	09:00	Moon 7.2° SSW of Saturn
Oct. 07	18:44	New Moon (Start of Lunation 1086)
Oct. 09	19:00	Moon 3.4° NNE of Venus
Oct. 10	00:00	Moon 3.4° SSW of Mars
Oct. 12	07:48	Extreme South Declination
Oct. 14	21:25	First Quarter
Oct. 17	20:00	Moon 4.4° NNW of Neptune
Oct. 18	18:19	Moon at Apogee (405432 km - 251,924 miles)
Oct. 20	04:00	Moon 6.5° NNW of Jupiter
Oct. 20	10:00	Moon 5.8° NNW of Uranus
Oct. 23	01:37	Full Moon
Oct. 26	22:36	Extreme North Declination
Oct. 30	12:46	Last Quarter
Nov. 02	00:00	Moon 0.62° NNE of asteroid 3 Juno
Nov. 03	17:23	Moon at Perigee (364,188 km - 226,296 miles)
Nov. 04	01:00	Moon 7.3° SSW of Saturn
Nov. 05	07:00	Moon 1.1° W of Venus
Nov. 06	04:51	New Moon (Start of Lunation 1087)
Nov. 07	03:00	Moon 1.8° SSW of Mercury
Nov. 07	23:00	Moon 1.7° SSE of Mars
Nov. 08	17:00	Extreme South Declination
Nov. 13	16:37	First Quarter
Nov. 14	01:00	Moon 4.6° NNW of Neptune
Nov. 15	11:48	Moon at Apogee (404,633 km - 251,427 miles)
Nov. 16	09:00	Moon 6.6° NNW of Jupiter
Nov. 16	18:00	Moon 5.9° NNW of Uranus
Nov. 21	17:28	Full Moon
Nov. 23	04:24	Extreme North Declination
Nov. 28	15:36	Last Quarter
Nov. 30	19:10	Moon at Perigee (369,438 km - 229,558 miles)
Dec. 01	13:00	Moon 7.4° SSW of Saturn
Dec. 02	18:00	Moon 6.2° SSW of Venus
Dec. 05	17:36	New Moon (Start of Lunation 1088)
Dec. 06	02:12	Extreme South Declination
Dec. 06	23:00	Moon 0.78° NE of Mars
Dec. 07	07:00	Moon 2.0° NNW of Mercury
Dec. 11	10:00	Moon 4.7° NNW of Neptune
Dec. 13	08:36	Moon at Apogee (404407 km - 251,287 miles)
Dec. 13	13:58	First Quarter
Dec. 13	21:00	Moon 6.6° NNW of Jupiter
Dec. 14	00:00	Moon 6.0° NNW of Uranus
Dec. 20	12:36	Extreme North Declination
Dec. 21	08:14	Full Moon (Total eclipse of Moon)
Dec. 25	12:25	Moon at Perigee (368,462 km - 228,952 miles)
Dec. 27	15:00	Moon 1.6° S of asteroid 3 Juno
Dec. 27	23:18	Last Quarter
Dec. 28	22:00	Moon 7.5° SSW of Saturn
Dec. 31	15:00	Moon 6.9° S of Venus

(Table courtesy of William Dembowski)

Lunar Transient Phenomena

Dr. Anthony Cook,
Program Coordinator
tony.cook@alpo-astronomy.org

Since the last ALPO-LTP subsection report, just two new LTP candidates have come to light (so to speak). The weights included are from 1 (only a slight chance this was a LTP) to 5 (scientifically proven LTP). For the full details, on each LTP, please see the Lunar Section publication "The Lunar Observer". Note that any future LTP alerts will be available live on http://twitter.com/lunarnaut

- 2010 Apr 18 UT 20:45-21:00 Peter Grego (UK) observed that Aristarchus was the brightest that he had ever seen it, and much brighter than any other features on the Moon; however, he was using a new 17-inch reflector for the first time. The crater appeared to fade during the observing period, but this may have been due to the Moon's low altitude and an obstructed view at the end of the observing session. Despite this, however, other features remained visible in Earthshine. (Weight=2).

- 2010 Apr 27 UT 00:10-02:00 Peter Grego (UK) noted a craterlet-like feature, just to the east of Briggs on an east-west trending lineament, or wrinkle ridge. There is no craterlet visible on LAC maps, nor on Lunar Orbiter or LROC images. Possibly this was some kind of shallow relief shadow effect that gave the impression of a craterlet at this illumination angle? (Weight=1).

I would like to thank in particular ALPO and BAA observers Jay Albert, Maurice Collins and Marie Cook for the many routine reports that they send in each month to the LTP subsection. Without the support of such observations over the years from our entire collection of observers, it would not be possible to do an analysis of the frequency of LTP compared to routine lunar observations. The preliminary results of such an analysis

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will be presented at this year's European Planetary Science Congress, in Rome, September 19-24.

Finally, live LTP alerts are now available via Twitter at *http://twitter.com/lunarnaut*.

Please visit the ALPO Lunar Meteoritic Impact Search site online at *www.alpo-astronomy.org/lunar/lunimpacts.htm*.

Mars Section

Roger Venable,
Section Coordinator
rjvmd@hughes.net

Another Mars apparition has been completed. Mars is now low in the western sky after dusk, and appears only a little larger than 4 arc-seconds in subtended diameter. A few observers have already contacted me about equipment upgrades for the next apparition. You have a number of months to get ready.

Visit the ALPO Mars Section online at *www.alpo-astronomy.org/mars*.

Minor Planets Section

Frederick Pilcher,
Section Coordinator
pilcher@ic.edu

As described in *Minor Planet Bulletin* Vol. 37, No. 3, 2010 July - Sept., the ability to measure real magnitudes of asteroids relative to stars in the CCD fields has enabled high quality magnitude parameters H and G as well as lightcurves with reliable rotation periods to be prepared for 1700 Zvezdara and (35055) 1984 RB.

Brian Warner reports that 5899 Jedicke is a binary asteroid, which raises the number of confirmed Hungaria-type binary asteroids to 12.

Lightcurves with derived rotation periods are also published therein for 113 other 112, 180, 194, 205, 221, 262, 292, 331, 347, 379, 421, 456, 479, 506, 581, 586, 616, 728, 747, 756, 766, 776, 862, 957, 968, 1001, 1042, 1060, 1069, 1266, 1311, 1317, 1364, 1372, 1416, 1599, 1654, 1750, 1840, 2013, 2181, 2216, 2219, 2235, 2888, 3045, 3422, 3458, 3534, 3567, 3819, 3986, 4024, 4764, 4765, 4868, 5424, 5832, 5914, 5967, 6066, 6382, 6495, 6560, 6734, 7774, 8062, 9199, 10094, 11064, 13123, 13709, 14162, 15786, 16924, 18181, 19404, 19732, 20762, 27181, 29251, 29742, 31076, 33341, 33816, 36298, 41467, 43064, 43595, 43606, 48154, 51276, 52722, 53431, 54896, 55760, 68547, 70030, 74350, 77733, 79087, 85839, 87228, 159402, 188077, 217807, 218144, 2000 CO101. Some of these provide secure period determinations, some only tentative ones.

Some are of asteroids with no previous lightcurve photometry, others are of asteroids with previous determinations and may be consistent or inconsistent with the earlier values.

We remind all users and inquirers that the *Minor Planet Bulletin* is a refereed publication and that it is available on line at *www.minorplanetobserver.com/mpb/default.htm*.

Jupiter and Ganymede as imaged by Rolando Chavez of metro Atlanta, Georgia, USA, on September 18, 2010 05:23 UT. Scope details: Cave Astrola 12.5 -in., f/6 Newtonian on Parks Superior Mount w/ OpticCraft 6.6 in. Drive & JMI Drive Corrector, True Technology Filter Wheel, Astronomik RGB filters, and 4x Barlow. Imaging details: DMK 21AU04 Camera at 30 fps, captured with IC Capture Software(proprietary), AutoStakkert & Registax5 (for aligning and stacking), PhotoShop & Astroart4 for processing. Transparency 4 of 6 (haze), Seeing 4-5 of 10, CM1=88°, CM2=90°, CM3=295°

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In addition, please visit the ALPO Minor Planets Section online at http://www.alpo-astronomy.org/minor.

Jupiter Section

Richard W. Schmude, Jr., Section Coordinator
schmude@gdn.edu

We continue to receive many images of Jupiter. Two big changes that have taken place on Jupiter in the last few months have been: 1) the fading of the South Equatorial Belt and 2) a possible impact event on June 3.

This section coordinator discussed these two events at the recent ALPO meeting in Jacksonville, Florida, USA, on July 31.

This coordinator is also working on the 2009 Jupiter apparition report and hopes to submit it in late September for publication this Journal. Once this report is submitted, the ALPO Jupiter section will be fully caught up. Work on the 2010-2011 apparition report will begin in the summer of 2011.

At this time, the ALPO Jupiter Section seeks someone to begin digitally archiving Jupiter images. We have kept paper copies of images up to 2009, but this is no longer feasible. If you would like to help archiving images, please contact me directly via e-mail at schmude@gdn.edu.

Visit the ALPO Jupiter Section online at http://www.alpo-astronomy.org/jupiter

Galilean Satellite Eclipse Timing Program

John Westfall, Assistant Jupiter Section Coordinator
johnwestfall@comcast.net

New and potential observers are invited to participate in this worthwhile ALPO observing program.

Contact John Westfall via regular mail at P.O. Box 2447, Antioch, CA 94531-2447 USA or e-mail to johnwestfall@comcast.net to obtain an observer's kit, also available on the Jupiter Section page of the ALPO website.

Saturn Section

Julius Benton, Section Coordinator
jlbaina@msn.com

(NEW) -- As this report was prepared (mid-August), Saturn was dipping very low in the west after sunset in darkening skies at apparent visual magnitude +0.8. Saturn passed opposition back on March 21, 2010, and the northern hemisphere and north face of the rings are becoming increasingly visible as the ring tilt towards Earth increases throughout the next several years, with regions south of the rings becoming progressively less favorable to view. Right now, the rings are inclined about +3.6° toward Earth. This tilt will continue to increase now to as much as to +6.0° right before conjunction with the Sun on October 1. The accompanying table of geocentric phenomena is provided for both the 2009-10 apparition and 2010-11 apparition for the convenience of observers.

Geocentric Phenomena for the 2009-2010 Apparition of Saturn in Universal Time (UT)	
Conjunction	2009 Sep 17^d
Opposition	2010 Mar 21^d
Conjunction	2010 Oct 01^d
Opposition Data:	
Equatorial Diameter Globe	19.5 arc-seconds
Polar Diameter Globe	17.8 arc-seconds
Major Axis of Rings	44.4 arc-seconds
Minor Axis of Rings	2.5 arc-seconds
Visual Magnitude (m_v)	0.5 m_v (in Leo)
B =	+3.2°
Geocentric Phenomena for the 2010-2011 Apparition of Saturn in Universal Time (UT)	
Conjunction	2010 Oct 01^d
Opposition	2011 Apr 04^d
Conjunction	2011 Oct 13^d
Opposition Data:	
Equatorial Diameter Globe	19.3 arc-seconds
Polar Diameter Globe	17.5 arc-seconds
Major Axis of Rings	43.8 arc-seconds
Minor Axis of Rings	6.6 arc-seconds
Visual Magnitude (m_v)	0.4 m_v (in Virgo)
B =	+8.6°

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Digital image taken on June 6, 2010, at 01:52 UT by Jim Melka of Chesterfield, MO, with a 30.5 cm (12.0 in.) Newtonian in visible light. The STrZ white spot had split into three very small fragments that were becoming more diffuse with time. Rhea is also visible in the image. South is at the top of the image. Ring tilt is +1.7º. CMI = 16.5°, CMII = 358.7°, CMIII = 19.4°.

For the 2009-10, small inclinations of rings continue to allow observers to witness and digitally image transits, shadow transits, occultations and eclipses of satellites lying near Saturn's equatorial plane. Apertures under about 20.3 cm (8.0 in.) are usually insufficient to produce the best views of these events, except perhaps in the case of Titan. Those who can image and obtain precise timings (UT) to the nearest second of ingress, CM passage, and egress of a satellite or its shadow across the globe of Saturn should send their data to the ALPO Saturn Section as quickly as possible. Notes should be made of the belt or zone on the planet crossed by the shadow or satellite, and visual numerical relative intensity estimates of the satellite, its shadow, and the belt or zone it is in front of is important, as well as drawings of the immediate area at a given time during the event.

So far this apparition, observers have submitted over 500 images and sketches of Saturn. Activity has been imaged in the South Tropical Zone (STrZ) in the form of a small, evolving white spot that began as a rather compact feature in early March, becoming somewhat elongated and exhibiting changes in overall morphology with time, eventually splitting into at least three smaller features in early June. There were reports in mid-April of a very diffuse South Equatorial Belt Zone (SEBZ) white spot and a general brightening of the northern Equatorial Zone (EZn).

The observation programs conducted by the ALPO Saturn Section are listed on the Saturn page of the ALPO website at http://www.alpo-astronomy.org/ as well as in considerable detail in the author's book, ***Saturn and How to Observe It***, available from Springer, Amazon.com, etc., or by writing to the ALPO Saturn Section for further information. Observers are urged to carry out digital imaging of Saturn at the same time that others are imaging or visually watching Saturn (i.e., simultaneous observations). Although regular imaging of Saturn is extremely important and highly encouraged, far too many experienced observers have neglected making visual numerical relative intensity estimates, which are badly needed for a continuing comparative analysis of belt, zone, and ring component brightness variations over time. Note that this type of visual work is strongly encouraged before or after imaging the planet.

The ALPO Saturn Section appreciates the dedicated work by so many observers who regularly submit their reports and images. *Cassini* mission scientists, as well as other professional specialists, are continuing to request drawings, digital images, and supporting data from amateur observers around the globe in an active Pro-Am cooperative effort.

Information on ALPO Saturn programs, including observing forms and instructions, can be found on the Saturn pages on the official ALPO Website at www.alpo-astronomy.org/saturn.

All are invited to also subscribe to the Saturn e-mail discussion group at Saturn-ALPO@yahoogroups.com

Remote Planets Section

Richard W. Schmude, Jr., Section Coordinator
schmude@gdn.edu

Christophe Pellier submitted some excellent images of Uranus and Neptune taken in 2010. The hope is that others will also be able to image Uranus and Neptune. We also hope to see photoelectric magnitude measurements of these two planets. Members of the ALPO have been making accurate brightness measurements of these two planets for the past 20 years.

This coordinator has completed the 2009 Remote Planets apparition report and it is currently with this Journal's editor. This coordinator has also sent out the Remote Planets Review newsletter. This newsletter contains finder charts for both Uranus and Neptune. It also contains a list of comparison stars and respective magnitude values for both visual and photoelectric photometry.

If you have not already received a copy of this newsletter, then please e-mail this coordinator at the address given above.

A reminder that the book *Uranus, Neptune and Pluto and How to Observe Them* is now available from Springer at www.springer.com/astronomy/popular+astronomy/book/978-0-387-76601-0 or elsewhere (such as www.amazon.ca/Uranus-Neptune-Pluto-Observe-Them/dp/0387766014) to order a copy.

Visit the ALPO Remote Planets Section online at http://www.alpo-astronomy.org/remote.

Feature Story:

ALPO Board Meeting Minutes, July 29, 2010 Jacksonville, Florida

Minutes provided by Matt Will, ALPO Secretary / Treasurer

Call to Order

On July 29, 2010, at 7:59 p.m., EDT (Eastern Daylight Time), ALPO Executive Director and Board Chairman, Richard W. Schmude called the ALPO Board to order in Conference Room F112, on the Kent Campus of Florida State College in Jacksonville, Florida.

ALPO Board members, Julius Benton, Don Parker, Ken Poshedly, Michael Reynolds, Richard Schmude (Chairman), John Westfall, and Matthew Will were present.

Board members Walter Haas (Founder) and Sanjay Limaye could not attend this year's conference and were therefore absent from the meeting. No phone service was available to tie them in.

Issue One: Approval of the 2009 Board Meeting Minutes (Matthew Will)

Board meeting minutes for our 2009 ALPO Board meeting were approved by all the present Board members.

issue Two: Location for the 2011 ALPO Meeting (Richard Schmude)

Executive Director Richard Schmude opened up discussion for the location of next year's convention and its location. Several possibilities were discussed. The Astronomical League has confirmed that they will meet in Bryce Canyon National Park, Utah, from June 29 through July 2, 2011. Considering the remoteness of Bryce Canyon, and that car travel for at least part of an attendee's trip would be necessary, the ALPO Board considered other alternatives.

John Westfall mentioned the possibility of the ALPO participating in a proposed "Solar Eclipse Conference 2011" (SEC2011). This proposed conference might be both more feasible and more affordable for ALPO members to attend. Such conferences have been held several times in the past, most recently in 2007, on years that have no total solar eclipse. A poll of subscribers to the Yahoo group “Solar Eclipse Mail List” (SEML) showed a desire to meet in summer 2011 in the Tucson area. At present, plans for any SEC2011 are very tentative.

Some interest was expressed in Las Cruces as a meeting site to meet on our own for next year's convention. It would give our founder, Walter Haas, a chance to attend a convention without traveling and the difficulties that are imposed on someone who is elderly. However, it is unlikely that any amateur astronomy clubs local to the Las Cruces area are interested in hosting an ALPO convention or conference. [Board member and Founder Walter Haas informed the Board after the Board meeting that the Las Cruces Astronomical Society had shown some recent interest in hosting an ALPO meeting. Walter said that he would broach the subject once more at the Society's August 27th meeting to see if they were still interested.]

The ALPO had met with the Royal Astronomical Society of Canada in 2007 in Calgary, Alberta, Canada. They are planning to meeting in Winnipeg, Manitoba in 2011. Understanding that these annual meetings of the RASC have a two-year planning track, the opportunity for meeting in 2011 is no longer feasible.

The Board concluded that if a meeting with the SEML in Tucson is still possible, that should be the ALPO's first choice, with the Astronomical League's meeting in Bryce Canyon as a fallback if the proposed meeting with SEML is rejected. John Westfall agreed to contact Glenn Schneider who conducted the aforementioned poll of SEML subscribers to inquire about the prospects for the ALPO participating in a possible SEC 2011.

Figure 1. Board meeting attendees (from left) Matthew Will, Richard Schmude, John Westfall, Mike Reynolds, Don Parker, Julius Benton. (Photo by Ken Poshedly.)

Issue Three: Membership and Finances (Matthew Will)

ALPO Secretary and Treasurer Matthew Will reported to the ALPO Board the ALPO's finances for the preceding year in the annual report submitted to the Board last February. An interim report concerning this year's activities was issued earlier this month. As of June 30, 2010, the ALPO has $5385.74 in the Springfield account and $3100.15 in the Las Cruces account. The current value of the ALPO Endowment is $25,976.21.

The ALPO membership still remains stable at 437 members with the release of this summer's issue of the *Journal*. The online payment options continue to remain popular among members, especially our members abroad who encounter steep surcharges for drafting personal checks payable to US banks from their home countries. Finances remain steady. Advertising revenues are down, but there are hopes that more advertisers will fill in these losses. Nevertheless, considering our overall finances, a membership dues increase is not foreseen through at least the first half of 2011.

Figure 3. Board members Julius Benton and John Westfall at the ALPO display table. (Photo by Matt Will.)

Figure 2. In session with Executive Director Richard Schmude. (Photo by Ken Poshedly.)

The digital version of the *Journal* continues to enjoy acceptance with about 54% of our membership, while cost for the paper *Journal* continues to be manageable thanks to our support with extra funding from our sustaining and sponsor members.

Issue Four: Staff Changes and Managerial Issues (General Board Discussion)

The ALPO Board reviewed acting staff appointments for possible promotion to permanent status. The Board voted to promote the following staff from acting to permanent status. The motion from this vote also covered some removals of staff as well. John Westfall made a motion to approve the promotions and departures and Ken Poshedly seconded. The Board approved the appointments to permanent staff and departures, voting 7 to 0.

- Lary Owens - Coordinator - Computing Section
- Wayne Bailey - Coordinator - Lunar Section

Wayne Bailey manages several lunar programs in addition to editing and distributing the section's newsletter, *The Lunar Observer*. Bruce Wingate, an acting assistant membership secretary was dropped. Since the complete work load of the Mars Section has shifted over to the other Mars Section coordinators, Dan Troiani, Dan Joyce, and Deborah Hines, have been retired as section coordinators. The ALPO Board thanks the two "Dans"

Figure 4. JALPO editor / publisher Ken Poshedly receives the 2010 Peggy Haas Service Award (Photo by Matt Will.)

and Deborah for their hard work over the years in supervising this section's activities and archiving the section's data. The Mars Section is one of the most active observing sections in the ALPO and is very demanding on its coordinators. Their past dedication is appreciated. Also, Guido Santacana, the translator for Spanish-language documents was retired since there has been no calling for this kind of work. The Board appreciated Dr. Santacana's offer of service with such matters. No new acting staff positions were appointed nor were any new sections provisionally created during this meeting.

Figure 5. (From left) Joan and Cecil Post with Beth Westfall at the Saturday evening banquet. (Photo by Matt Will.)

Ken Poshedly brought up a continuing issue concerning inactive staff and inactive sections within the ALPO. Ken pointed to several sections and programs that are currently not active. These sections tend to be non-observing sections that should either offer a service or else support other observing programs in some indirect manner. Several options could be implemented. An inactive section could be shut down and withdrawn. Personnel could be replaced and the section could continue to be listed on the ALPO roster. Or, if work is infrequent and activity is not routine, the section might be closed and participants in a former section or program could continue to publish in the *Journal* as the need arises and the situation presents itself. Richard and Ken will work with other sections and coordinators to ascertain the status of these sections and determine if they are still active and productive.

Figure 6. “Galileo Galilei” (by period actor Robert Dawson of Miami) with his telescope at the Saturday evening banquet. Mr Dawson of Miami, Florida, has made numerous appearances at the Miami Science Museum. (Photo by Ken Poshedly.)

Ken concluded the discussion of staff issues by mentioning a problem with his own Publications Section staff. Peer review editing that is conducted by the scientific editors of the *Journal* should go well beyond style and grammatical corrections. Peer review means primarily that the scientific content and data in the article or scientific paper should be reviewed for accuracy and correctness. Submissions to the *Journal* should not be considered perfect in its scientific content. Even though section coordinators and other writers strive to submit accurate and correct data, central meridians, colongitudes, other mathematical formulations, factual statements and the citing of references can sometimes be incorrectly determined despite the best of intentions. The role of a peer review editor should be to review EVERYTHING, that is, all content submitted in the paper in order to catch all possible errors.

Until recently, our founder, Walter Haas, served as a final peer review editor, reviewing everything before it went to press in the *Journal*. The *Journal* staff does not have that luxury any more, since Walter has retired from that role. Scrutiny over content is all important. Our *Journal* is taken seriously not only by the amateur community but increasingly by the professionals as well.

The *Journal* has enjoyed an excellent reputation as a leading journal for its type in the field amateur astronomy, in the past. There is no reason why this tradition should not continue. The Board thanked Ken for his comments and wholeheartedly endorses what he said.

Issue Five: Central Headquarters or Office (Matthew Will)

Matthew Will introduced a progress report (or lack of progress report would be more apt) about plans for a future central headquarters or office for the ALPO. Currently, the ALPO maintains collections of scientific and organizational material in storage facilities, while other collections are actively maintained by section coordinators at their private residences. Still other collections of scientific literature and data maintained by others that could be donated to the ALPO have no repository currently maintained by the ALPO. Indeed, in some cases, private papers such as our founder's, Walter Haas, are going to other institutions (New Mexico State University Library in Walter's case) to be preserved. With respect to the ALPO's own scientific data maintained by section personnel, historic data tends to be one-of-a-kind documents where duplication of materials preserved at a separate location could ensure that scientific data would never be permanently lost.

Matthew Will has been working to provide the Board with a more detailed business plan for this project that would be an expansion of an outline submitted six years ago to the Board. This "blueprint" would cover such areas as the scope and size of such an operation, fundraising, and other management issues. It could be shared with prospective contributors and other donating their time and expertise to such an operation. Matt sought an endorsement from the Board to proceed on this activity and the authority to talk to other organizations and entities in developing this plan. Ken Poshedly made a motion to locate, identify, and study other models that could be used to research what is needed for developing a central headquarters or office. Richard Schmude seconded the motion. The Board voted 7 to 0 to support the motion. Matthew Will thanked the Board for their support for this critical issue.

Issue Six: Staff and Board Guidelines (Matthew Will)

As most ALPO Staff and Board members are aware, the ALPO maintains guideline booklets for staff and board members as a reference for maintaining and directing their sections and providing other information about ALPO operations. Matthew Will plans to release another version of these guidelines documents in November of this year with updates to certain topics in the booklets.

Issue Seven: Thank-You Notices (Mike Reynolds)

Mike Reynolds requested that the ALPO provide thank-you letters to all ALPO speakers and presenters at the 2010 ALPO Conference. Mike will provide the names and addresses of the speakers to Secretary Matthew Will and he will produce and distribute the thank-you letters. Several invited speakers requested the thank-you letters since these letters can be used to justify a tax deduction with the United States IRS.

Issue Eight: Online Journals (John Westfall)

Access to *Journal ALPO* issues online dating back to 1985 should now be completed by Astrophysics Data Systems (ADS). This group is managed by the Smithsonian Astrophysical Observatory and funded by NASA. They have already scanned in many professional astronomy journals and have made them available online. Pre-1985 issues of the *Journal* now need to be scanned in, however; while complete collections of the *Journal* do exist, the scanning of the paper copies of *Journals* from 1985 through 2000 was performed with duplicate copies of issues provided by John Westfall that were expendable.

In the scanning process, ADS unstaples the bound copies of a journal to load into their scanner. Afterwards, when scanning is complete, the original paper copies are destroyed and photocopies of the originals are sent back to John in a format that makes it difficult to use. Currently, there are no extra duplicated copies of the *Journal* before 1985, where original paper copies can be destroyed after scanning. Pre-1985 copies of the *Journal* do exist as a part of one-of-a-kind collections with no duplication. Due to their rarity and the fact that John Westfall's collection is a personal collection, destruction of John's copies is, of course, unacceptable.

Walter Haas may have some duplicate issues that can be offered for this project with no loss to his permanent collection. However, not all issues have available duplicates, so some pre-1985 issues will not be scanned. John will work with Walter and others to find pre-1985 duplicate issues that can be used by ADS for their scanning processes and thus making more of the *Journal* publicly available through electronic means.

Adjournment

With no other business to conduct, Richard Schmude made a motion to adjourn the Board meeting. John Westfall seconded. The motion passed with seven Board members voting in the affirmative with the Board meeting adjourning at 9:52 p.m., EDT, on July 29, 2010.

2010 Walter H. Haas Observers Award Winner Detlev Niechoy

Now age 51 with a wife and two young daughters, Detlev is a revenue officer during his non-astro hours in the central Germany town of Göttingen. He first became interested in astronomy at age 13 when he began learning the constellations. In 1973, he used his first scope (a 60 mm refractor) to observe the Moon, double stars, planets, comets, deep sky objects and even used solar projection to learn about and sketch sunspots. Six years later, he purchased his C8 and began actively drawing the planets, sun spots, deep sky objects and more.

Since then, he says, his motto has been "Astronomy is my life".

Throughout the 1980s and 1990s, Detlev worked with Arbeitskreis Planetenbeobachter - Fachgruppe der Vereinigung der Sternfeunde e.V. (loosely translated as "German astronomical society of amateur astronomers"), first with Mars, Jupiter and Saturn. In 1985, he worked with the inner planet sections (Mercury and Venus) of the German planetary observers group. Here priority was visual observations of Venus during the day, twilight and in the night sky.

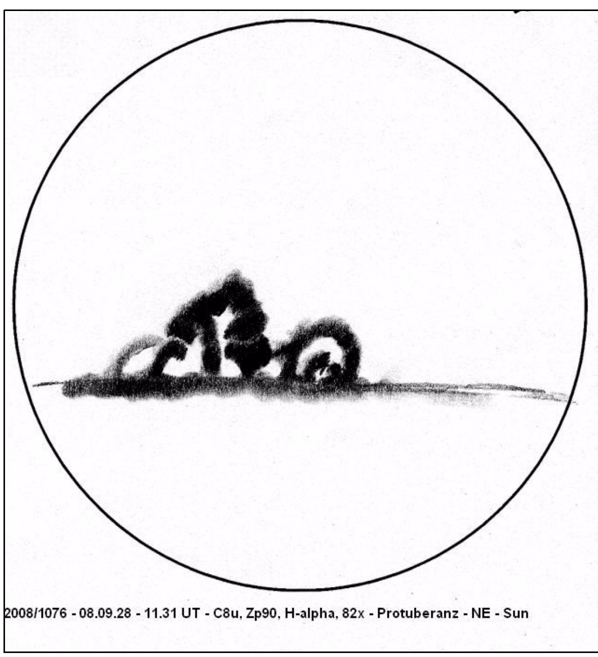
In September 1999, he began making temporary webcam images to compare with visual drawings (for examples, go to his website at *http://www.dniechoy.de/*)

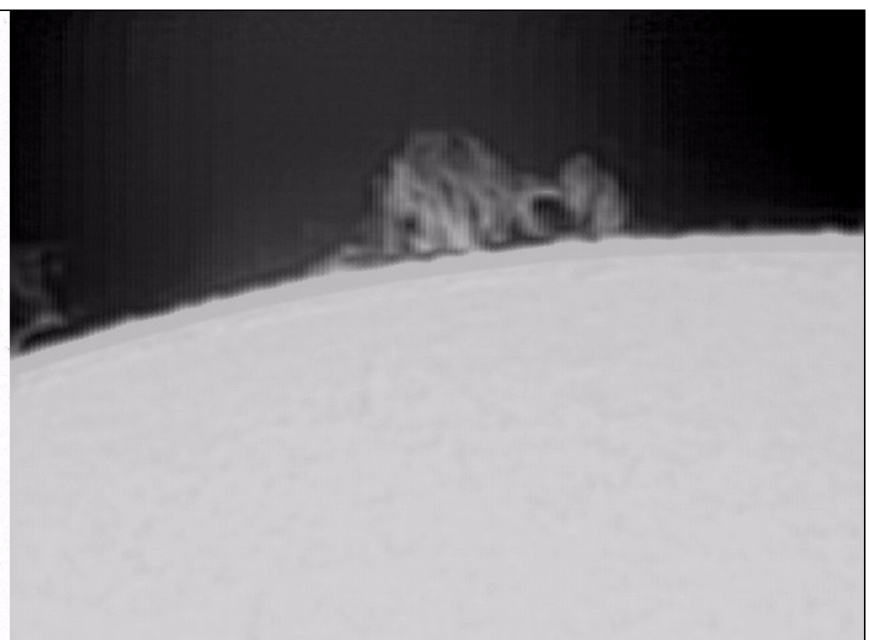
Delev has been an ALPO member since 1987 and keeps up with information about planetary observations, their evaluations and the solar system. He offers his own special thanks for this to Julius L. Benton, Jr, Daniel M. Troiani, Don Machholz, Frank J. Melillo, Richard Schmude, Harry Jamieson, Harry Pulley, Phillip H. Budine, John Westfall and Gordon W. Garcia.

Detlev's own contributions to the ALPO include the Solar Section, Mercury Section, Venus Section, Jupiter Section, Saturn Section, Remote Planet Section and temporarily, the Mars Section.

"Now, I try to observe every day whenever the sky is clear and I have the time."

(Above) Detlev with his ALPO plaque and C8; (below) sketch & image by Detlev of solar prominence.





Feature Story:
Index to Volume 51 (2009) of The Strolling Astronomer

By Michael Mattei
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PUBLICATION DATA

Issue Number:

AUTHOR INDEX

SUBJECT INDEX

Feature Story

ALPO Observations of Mercury During the 2008 Apparitions

By Frank J Melillo, coordinator, ALPO Mercury Section
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Abstract

There were six apparitions of Mercury in 2008. Compared to 2007, there was a slight increase to 12 observers, who submitted 23 drawings, 4 CCD images, and 48 webcam images, for a total 75 observations. They used apertures from 9 to 31.5 centimeters (3.5 to 12.5 inches). Features detected show good correlation with the MESSENGER fly-bys and with the IAU albedo chart prepared by Murray, Smith and Dollfus (Murray, Smith, and Dollfus, 1972.)

Introduction

2008 was an exciting year for the ALPO Mercury Section. We had two MESSENGER flybys, which sent back many stunning images of previously unseen surface details, and we were able to compare our images with those of the MESSENGER spacecraft. Also, this coordinator showed our work to the professional community with a poster presentation at the 40th meeting of the Division of Planetary Sciences of the American Astronomical Society. Finally, John Boudreau continued to improve his imaging techniques and has produced images of Mercury that show unprecedented detail.

During 2008, Mercury made three evening and three morning apparitions (see **Table 1**.) Observations were reported by 12 persons, of whom one is located in the Southern Hemisphere (see **Table 2**.) As in recent years (Melillo, 2008a and 2009b,) the webcam was the most-often used mode of observing, follow by drawing. We had some reports of simultaneous observations, which are an important part of our work.

The MESSENGER spacecraft remains in good health as it continues to orbit the Sun. It made a final Mercury flyby in 2009, and it will enter Mercury orbit in 2011.

Mercury deserves its reputation of being one of the most difficult objects to observe through a telescope (Melillo, 2004; Boudreau, 2009.) In exploring the portion of its surface that has not been imaged by spacecraft, ALPO members have shown great dedication. We hope that the present report will inspire more readers to observe this tiny planet.

Apparition 1: Evening, December 17, 2007 – February 6, 2008

After the Superior Conjunction of December 17, 2007, Mercury entered the evening sky. It reached greatest eastern elongation on January 22. Although this was the second best evening apparition of 2008 for northern hemisphere viewers, only four braved the cold to study Mercury during this apparition.

On January 15, the MESSENGER probe made the first of the two close flybys in 2008. During the outbound journey, the spacecraft looked back and imaged stunning details of albedo features and rayed craters. One day later, John Boudreau made the apparition's first image at CM 237°. Boudreau captured the three rayed craters near the terminator, which are seen in the MESSENGER image as well. Also, Caloris Basin is visible in Boudreau's image as a patchy white area on the northeast part of the disk. MESSENGER has confirmed that Caloris is a large, light albedo feature visible in this region. It is quite an achievement for an amateur imager to capture the main albedo features imaged by MESSENGER at nearly the same longitude. Boudreau imaged again on January 18 at CM 246°, and Mercury displayed features similar to those in his first image. Ed Lomeli made an image nearly simultaneous to Boudreau's on the January 18. Lomeli's conditions were less favorable, but major features can be

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Observing Scales

Standard ALPO Scale of Intensity:
- 0.0 = Completely black
- 10.0 = Very brightest features
- Intermediate values are assigned along the scale to account for observed intensity of features

ALPO Scale of Seeing Conditions:
- 0 = Worst
- 10 = Perfect

Table 1. Characteristics of the Apparitions of Mercury in 2008

Number and Type	Beginning Conjunction*	Greatest Elongation	Final Conjunction*	Aphelion	Perihelion
1. Evening	17 Dec (2007)(s)	22 Jan	6 Feb (i)		27 Jan
2. Morning	6 Feb (i)	3 Mar	16 Apr (s)	11 Mar	
3. Evening	16 Apr (s)	14 May	7 Jun (i)		24 Apr
4. Morning	7 Jun (i)	1 Jul	29 Jul (s)	7 Jun	21 Jul
5. Evening	29 Jul (s)	11 Sept	7 Oct (i)	3 Sept	
6. Morning	7 Oct (i)	22 Oct	25 Nov (s)		17 Oct

All dates are in UT.
* (i) means Inferior Conjunction, (s) means Superior Conjunction.

Table 2. ALPO Observers of Mercury 2008

Observer	Location	Instrument*	Number and Type of Observation**	Apparitions Observed
John Boudreau	Saugus, MA, USA	27.5 cm SCT	18 W	1,2,4,5,6
Brian Cudnik	Houston, TX, USA	25.4 cm NT	1 D	6
Mario Frassati	Crescentino, Italy	20.3 cm SCT	8 D	2,3
Lorenzo Frassati	Crescentino, Italy	20.3 cm SCT	1 D	3
Ed Lomeli	Sacramento, CA, USA	23.5 cm SCT	27 W	1,2,3,4,5,6
Antonello Medugno	Capua, Italy	35.0 cm SCT	1 W	1
Frank J Melillo	Holtsville, NY, USA	25.4 cm SCT	4 CCD	4,6
Carl Roussell	Hamilton, Ontario, CA	15.0 cm RL	11 D	1,2,3,4,5,6
Arwen Roussell	Hamilton, Ontario, CA	15.0 cm RL	1 D	2
Mike Salway	Central Coast, NSW, Austalia	30.0 cm NT	1 W	2
Sean Walker	Chester, NH USA	31.5 cm NT	1 W	3
Tim Wilson	Jefferson City, MO USA	12.7 cm SCT	1 D	3

* NT = Newtonian, RL = reflector, RR = Refractor, SCT = Schmidt-Cassegrain
** CCD = CCD imaging, D = Drawing, W = Webcam

seen, and these correspond well to those imaged by MESSENGER (see **Figure 1**). The correspondence of these amateur's images to those of the MESSENGER spacecraft was detailed in a previous article (Melillo 2009a).

Antonello Medugno of Italy imaged Mercury on January 19 at CM 250°. His image showed Mercury in a gibbous phase, but it was quite hard to make out surface details. On January 25, at CM 283°, Boudreau made a webcam image and Carl Roussell made a drawing that were nearly simultaneous observations. Both showed Mercury as a fat crescent, although the albedo details are too difficult to discern. Mercury passed through Inferior Conjunction on February 6.

Apparition 2: Morning, February 6 – April 16

This apparition was well observed despite of the poor apparition for Northern Hemisphere observers, for whom Mercury appeared very low in the southeastern sky throughout the whole apparition. One observer, Mike Salway of Australia, contributed his first observation of Mercury.

Ed Lomeli's first observations were on February 28 and 29, at CM's of 142° and 147°. These showed Mercury at nearly half phase. Mario Frassati made drawings on March 2 and 3, at CM's of 154° and 159°, and both drawings showed the albedo features Solitudo Helii in the southern hemisphere and Solitude Neptuni to the north. Also on March 3, Mike Salway imaged Mercury at half phase at CML 161°. Greatest elongation occurred on that day, and Salway's image was made at the unusually great elongation of 27° west.

Lomeli continued to image and Frassati to draw, until March 22, when the CM was 253°. On these images and drawings, it is difficult to correlate the features with those on the standard map of Murray, Smith, and Dollfus. On March 24, at CM 262°, John Boudreau imaged Mercury and detected what seems to be a dark marking near its limb. Carl Roussell and his daughter Arwen both drew Mercury on March 29, at CM 285°. The drawings both showed what appears to be Solitudo Criophori as a dark band across the disk. Boudreau imaged Mercury again on March 30, at CM 289°, and detected what appears to be a large dark area just north of the equator near the center. The dark feature that Boudreau imaged on March 24 and March 30 may be the large dark feature that has been informally called the Skinakas Basin (see Melillo, 2008b.) Lomeli made his last image of the apparition on April 3 at CM 307°, showing nearly a full phase with two rayed craters in the south (see **Figure 2**). Mercury went through Superior Conjunction on April 16.

Apparition 3: Evening, April 16 – June 7

This apparition was favorable as seen from the Northern Hemisphere, but this observing section received fewer reports than it did during previous years' springtime evening elongations.

Ed Lomeli's first image of the apparition was made on April 27, at CM 46°, and it showed bright spots and possibly the rayed crater Kuiper near the center. Carl Roussell and Tim Wilson made simultaneous observations on April 30, at CM 56°, and both drawings showed Solitudo Martis as a dark band near the terminator. Lomeli again imaged Mercury on May 4 at CM 76°, showing nearly a blank disk. Roussell made another drawing on May 5 at CM 77° and it showed Solitudo Martis again as a dark marking in the south. Also on May 5, at CM 81°, Sean Walker made an excellent image, but the details are hard to correlate with known features. Mario Frassati and his son Lorenzo made some drawings on May 8 at CM 94°, and these showed what appears to be Solitudo Jovis in the south. Frassati and Roussell made their last observations on May 13 and 14, at CM's 119° and 121°. Both showed possible markings as Solitudo Jovis in the south and Solitudo Horarum in the north (see **Figure 3**). Mercury ended the evening apparition on June 7.

Apparition 4: Morning, June 7 – July 29

This apparition was favorable for Northern Hemisphere viewers, and it was during the summertime. However, the observations that the ALPO Mercury Section received showed fewer albedo features than usual.
John Boudreau, Ed Lomeli, Carl Russell, and this author made observations from June 21, at CM 0°, to July 17, at CM 131°, but depicted few details. Within these longitudes, Solitudos Martis, Jovis, and Helii have been quite prominent in recent apparitions, but they were not seen well this time (see **Figure 4**). Mercury passed through Superior Conjunction on July 29.

Apparition 5: Evening, July 29 – October 7

This apparition lasted longer than two months but was rather poor as seen from the Northern Hemisphere. Surprisingly, the ALPO Mercury Section received many observations, although for northern observers the planet was very low in the southwestern sky after dusk.

Ed Lomeli began imaging Mercury on August 9 at CM 222°, when it was still near full phase. He continued to image Mercury through August 13, when the CM was 240°. In these images, the phase and angle of view were generally the same as those presented to MESSENGER on the outbound leg of its first flyby. Unfortunately, the albedo features were hard to detect, perhaps due to the planet's low altitude. Lomeli, Carl Roussell, and John Boudreau made further observations through September 20, when the CM was 70°. In these drawings and images, it is difficult to discern any known albedo features. Exceptions are two of Roussell's drawings, in which it appears that he might have depicted Solitudo Criophori in the south (see **Figure 5**). Mercury went through Inferior Conjunction with the Sun on October 7.

Apparition 6: Morning, October 7 – November 25

This was perhaps the most exciting apparition of all time. Mercury displayed a fine appearance in the morning sky while the MESSENGER spacecraft made its second flyby of the year. On October 6, the craft flew above Mercury's surface just one day before Inferior Conjunction. Then, as Mercury gained western elongation in the morning sky, its rotation brought into our view the same part of the surface that was visible to MESSENGER on its inbound leg. The ALPO Mercury Section has received high quality observations and they can be compared with the MESSENGER images.

John Boudreau imaged Mercury on October 15 and October 18 at CM's of 237° and 255°. On both dates, his images appeared very similar to the MESSENGER inbound second flyby image. The dark area informally known as the Skinakas basin is visible as a dark feature in the north. On October 20, at CM 266°, Boudreau, Ed Lomeli, and this author made nearly simultaneous observations. Melillo's and Boudreau's images are 10 minutes apart, at 14:35 and 14:45 UT, respectively, while Lomeli's image was taken about 4 hours later at 18:40 UT. The three images show the same features, including the former

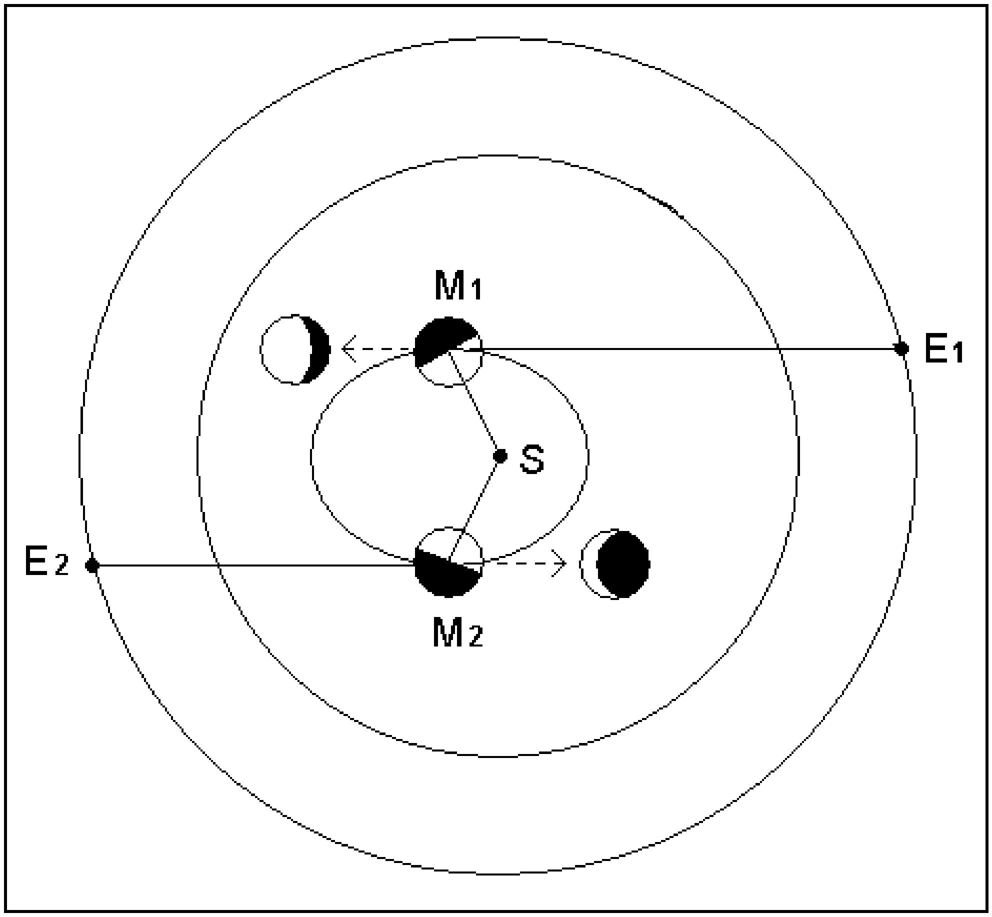

Figure 1. Possible variations in the phases of Mercury at its greatest elongations from the Sun. In the diagram, S is the Sun, E1 and E2 are two positions of Earth, and M1 and M2 are two positions of Mercury corresponding to E1 and E2. Greatest elongation occurs when the line of sight from Earth to Mercury is tangent to the orbit of Mercury. These greatest elongation lines of sight are drawn in the diagram; E1-to-M1 indicates greatest eastern elongation, and E2-to-M2 indicates greatest western elongation as seen from Earth. The elliptical orbit of Mercury causes its appearance at greatest elongation to vary greatly, because the S - E - M angle varies greatly. S - E1 - M1 is less than 90°, so that Mercury is seen as gibbous, while S - M2 - E2 is greater than 90° so that Mercury is seen as a crescent. The phase of Mercury at elongation can be anywhere from about 35% to 65% illuminated.

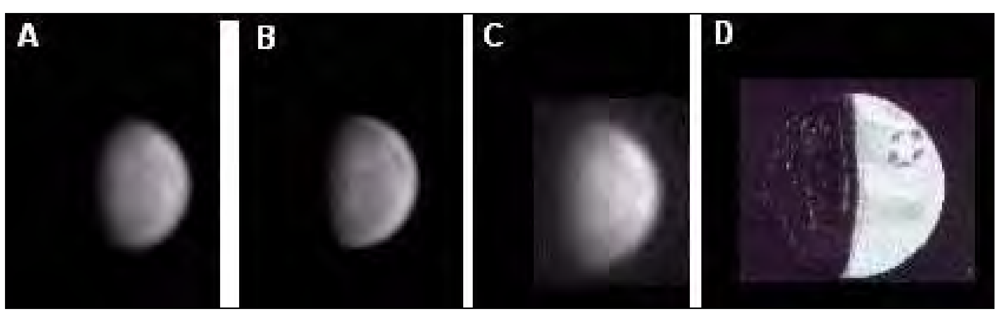

Figure 2. Images from Apparition 1 (see text). In this and all other figures in this article, north is up and planetary east is to the right.
A. Image by John Boudreau, 16 Jan 2008, 19:24 UT, CM = 237°.
B. Image by John Boudreau, 18 Jan 2008, 20:06 UT, CM = 246°.
C. Image by Ed Lomeli, 18 Jan 2008, 21:55 UT, CM = 246°.
D. Drawing by Carl Roussell, 25 Jan 2008, 23:00 UT, CM = 283°.

Skinakas basin in the north and Solitudo Criophori in the south (see **Figure 7**).

Boudreau and Lomeli continued to image Mercury on October 22, 23, and 24, at CM's of 276°, 281° and 289°. On successive images, the surface features moved with the planet's rotation toward the terminator, while the white-spot rayed craters appeared on the limb. Also, Melillo and Lomeli made simultaneous observations on October 26, at CM 296°. Lomeli's image showed with excellent resolution the features on the terminator and three rayed craters, along with a possible new rayed crater on the south side of the disk. Melillo's image showed the same features, but at a lower resolution. Carl Roussell made an excellent drawing on October 27 at CM 300°, showing the same features near the terminator and a bright area where the

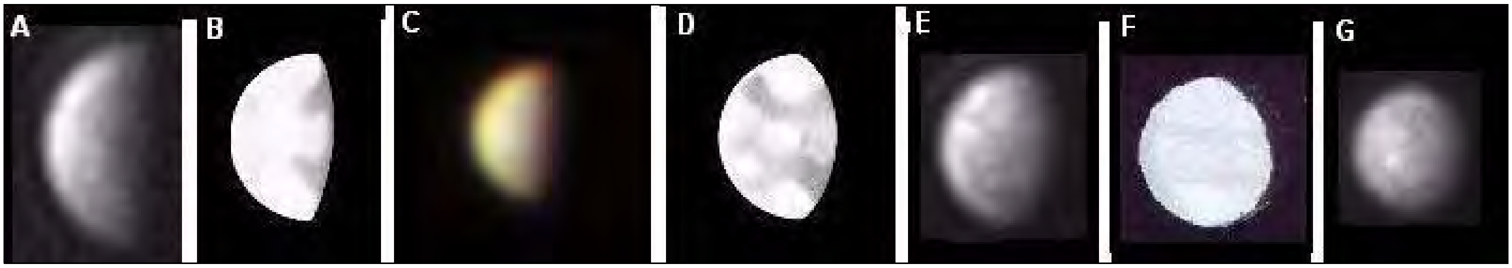

Figure 3. Images and drawings from Apparition 2 (see text):

A. Image by Ed Lomeli, 28 Feb 2008, 19:43 UT, CM = 42
B. Drawing by Mario Frassati, 3 Mar 2008, 6:15 UT, CM = 159°
C. Image by Mike Salway, 3 Mar 2008, 19:15 UT, CM = 161°
D. Drawing by Mario Frassati, 12 Mar 2008, 6:50 UT, CM = 204°
E. Image by Ed Lomeli, 21 Mar 2008, 19:11 UT, CM = 249°
F. Drawing by Arwen Roussell, 29 Mar 2008, 19:38 UT, CM = 285°
G. Image by Ed Lomeli, 3 Apr 2008, 12:03 UT, CM = 307°

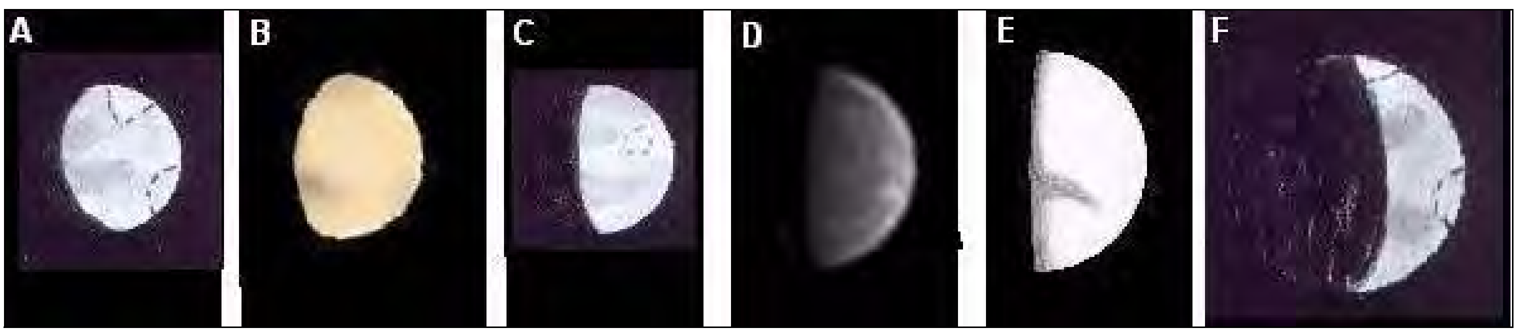

Figure 4. Images and drawings from Apparition 3 (see text):

A. Drawing by Carl Roussell, 30 Apr 2008, 0:30 UT, CM = 55°
B. Drawing by Tim Wilson, 30 Apr 2008, 1:15 UT, CM = 56°
C. Drawing by Carl Roussell, 5 May 2008, 1:00 UT, CM = 77°
D. Image by Sean Walker, 5 May 2008, 22:49 UT, CM = 81°
E. Drawing by Lorenzo Frassati, 8 May 2008, 18:55 UT, CM = 94°
F. Drawing by Carl Roussell, 14 May 2008, 0:31 UT, CM = 121°

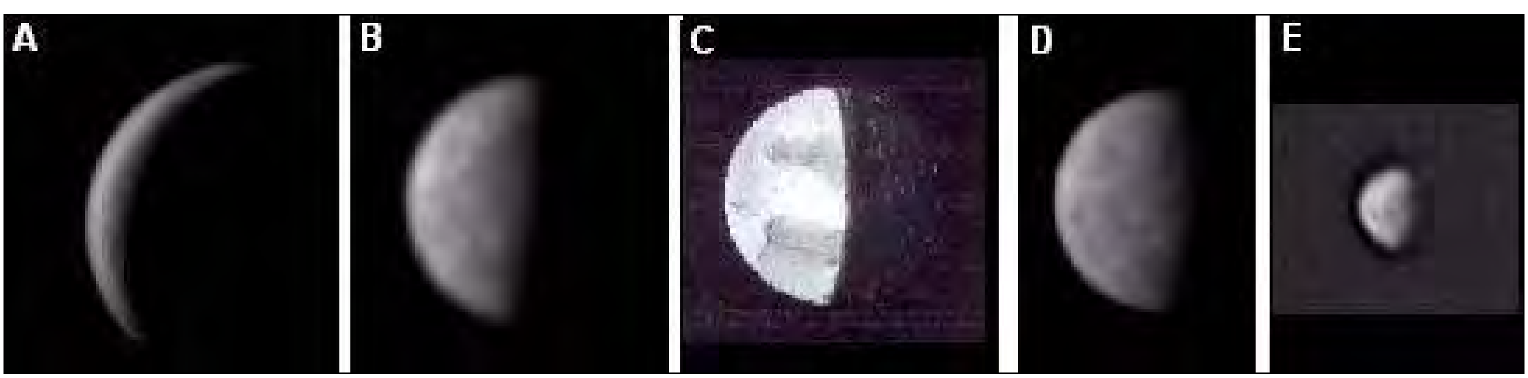

Figure 5. Images from Apparition 4 (see text).

A. Image by John Boudreau, 21 Jun 2008, 14:17 UT, CM = 0°
B. Image by John Boudreau, 8 Jul 2008, 13:20 UT, CM = 90°
C. Drawing by Carl Roussell, 10 Jul 2008, 9:45 UT, CM = 99°
D. Image by John Boudreau, 11 Jul 2008, 12:28 UT, CM = 104°
E. Image by Frank J Melillo, 13 Jul 2008, CM = 114°

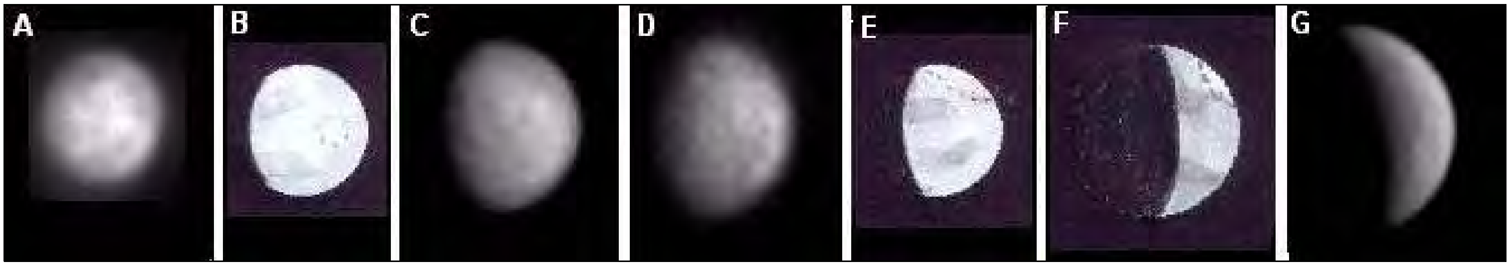

Figure 6. Images from Apparition 5 (see text)..

A. Image by Ed Lomeli, 9 Aug 2008, 0:01, CM = 222°
B. Drawing by Carl Roussell, 21 Aug 2008, 0:23 UT, CM = 280°
C. Image by John Boudreau, 21 Aug 2008, 22:40 UT, CM = 279°
D. Image by Ed Lomeli, 24 Aug 2008, 18:30 UT, CM = 293°
E. Drawing by Carl Roussell, 26 Aug 2008, 22:02 UT, CM = 303°
F. Drawing by Carl Roussell, 18 Sept 2008, 23:30 UT, CM = 59°
G. Image by John Boudreau, 20 Sept 2008, 21:19 UT, CM = 70°

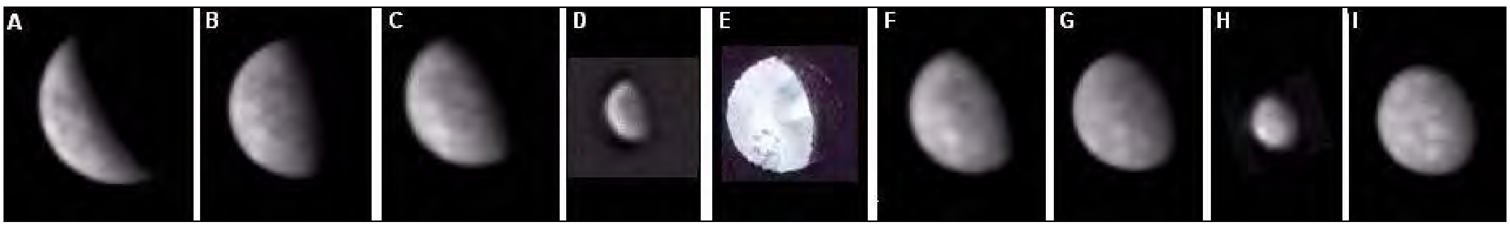

Figure 7. Images from Apparition 6 (see text).

A. Image by John Boudreau, 18 Oct 2008, 15:18 UT, CM = 255°
B. Image by Ed Lomeli, 23 Oct 2008, 16:00 UT, CM = 289°
C. Image by John Boudreau, 24 Oct 2008, 14:29 UT, CM 289°
D. Image by Frank J Melillo, 26 Oct 2008, 14:14 UT, CM = 296°
E. Drawing by Carl Roussell, 27 Oct 2008, 11:00 UT, CM = 300°
F. Image by John Boudreau, 27 Oct 2008, 14:10 UT, CM = 300°
G. Image by Ed Lomeli, 29 Oct 2008, 17:00 UT, CM = 311°
H. Image by Frank J Melillo, 31 Oct 2008, 15:15 UT, CM = 320°
I. Image by John Boudreau, 2 Nov 2008, 14:55 UT, CM = 328°

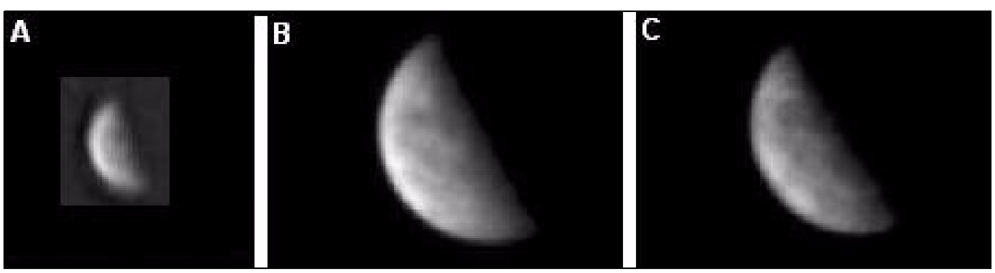

Figure 8. A nearly simultaneous observation on 20 October 2008 at CM = 266°.
A. Image by Frank J Melillo, 14:35 UT.
B. Image by John Boudreau, 14:45 UT.
C. Image by Ed Lomeli, 18:40 UT.

rayed craters are located. Boudreau made an image just 3 hours and 10 minutes after Roussell's drawing, and showed three rayed craters and a possible fourth one near the CM on the south side. So far, that area has not been imaged by spacecraft, and it could be a new rayed crater! It appeared in both Boudreau's image of October 27 and Lomeli's image of October 26 (see **Figure 6**).

Boudreau, Lomeli, and this author continued to image Mercury on October 28, 29, 30, 31, and November 2, at CM's of 306°, 311°, 315°, 320° and 328°. These images showed the three rayed craters clearly. On November 2, Boudreau's image showed the Kuiper rayed crater rotated into view on the limb (see **Figure 6**). After that, Mercury was no longer visible as it neared the Superior Conjunction on November 25.

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Melillo FJ (2009b). "*ALPO Observations of Mercury During the 2007 Apparitions*." *Journal of the Assoc of Lunar & Planetary Observers 51*(3):21-25.

Murray JB, Smith BA and Dollfus A (1972). *Cartography of the Surface Markings of Mercury*. *Icarus* 17(Dec):576-584.

ALPO MERCURY SECTION

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APPARITION:
Morning_____
Eveining_____

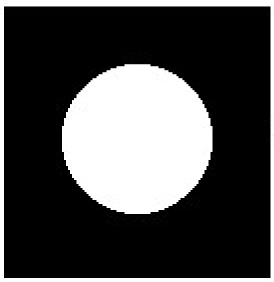
ARC SECONDS____"
ELONGATION:
____° from the sun

For Coordinator Only:

Sketch

DATE__________________
TIME (UT)______________
Telescope__________________________
Magnification_______________________
Filter(s)____________________________
Seeing (10-best/1-worst)______________
Visual Description:

NORTH



WEST

Central Meridian Longitude______°

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Image 1

Central Meridian Longitude______°

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Exposure:_____________________
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Filter:_________________________

Comments:

Date:________________
TIME (UT):____________

Image 2

Central Meridian Longitude______°

Telescope_____________________
Camera Type__________________
Exposure______________________
f/ratio_________________________
Filter__________________________

Comments:

Send all observations to: Frank J Melillo
ALPO Mercury Coordinator
14 Glen-Hollow Dr., E-#16
Holtsville, NY 11742

E-mail for questions, special observations and alerts: frankj12@aol.com

Feature Story: Jupiter

Observations During the 2006 - 2007 Apparition

By: Richard W. Schmude, Jr., coordinator, ALPO Jupiter Section
schmude@gdn.edu

This paper includes Jupiter images submitted by a number of observers.

Abstract

Drift rates for over a dozen currents are reported. The North Temperate Current, current D was observed in early 2007 and its drift rate was consistent with a rotation period of 9h 46m 55s. A circulating current was observed in July-August. The drift rates of its southern and northern borders were consistent with rotation rates of 9h 54m 00s and 9h 58m 20s, respectively. The selected normalized magnitudes of Jupiter for 2007 are: B(1,0) = -8.49±0.05, V(1,0) = -9.37±0.01, R(1,0) = -9.80±0.02 and I(1,0) = -9.65±0.02.

Introduction

Many new developments related to Jupiter took place in 2007. For example, during 2007, both the Mars Reconnaissance Orbiter (McDowell, 2007, 24) and the New Horizons spacecraft (Tytell, 2007, 16-17) recorded images of Jupiter. Coffey (2007, 16) and Simon-Miller et al (2006, 560) reported that the winds in Oval BA increased from 120 meters/second in 1979 to 180 meters/second in 2006. Finally, Rogers (2007a, 113; 2007b, 226; 2008a, 9) summarized several important events that took place on Jupiter in 2007.

The characteristics of Jupiter for 2006-07 are listed in Table 1. Those people who submitted observations, images or measurements of Jupiter during the 2006-07 apparition are listed in Table 2.

This paper will follow certain conventions. The planetographic latitude is always used. West refers to the direction of increasing longitude. Longitude is designated with the Greek letter λ, followed by a subscript Roman numeral that is the longitude system. For example, $\lambda_I = 54°$ means that the System I longitude equals 54° W. The three longitude systems are described in (Rogers, 1995, 11; 2006, 334), (Astronomical Almanac, 2003, L9). All dates and times are in Universal Time (UT). Belts and currents are abbreviated; for example, the North Equatorial Belt is the NEB, the South Tropical Current is the STrC and the North North North North Temperate Current is the N^4TC. A few belts and zones are shown in Figure 1A. Unless stated otherwise, all data are based on visible light images. All methane band images were made in light with a wavelength near 0.89 µm. All currents, except where noted, are named in accordance with Rogers (1990, 88).

Disk Appearance

Cudnik, Heath, Roussell and the writer made over 150 intensity estimates of Jupiter's features. These estimates were made

Table 1: Characteristics of the 2006 - 07 Apparition of Jupiter[a]

First conjunction date	2006 Nov 21
Opposition date	2007 Jun 05
Second conjunction date	2007 Dec 23
Brightness at opposition (stellar magnitude)	-2.6
Equatorial angular diameter at opposition	45.8 arc-seconds
Right Ascension at opposition	16h 55m
Declination at opposition	21.9º S
Planetocentric latitude of the Earth at opposition	3.3° S
Planetocentric latitude of the Sun at opposition	3.2° S

[a]Data are from the Astronomical Almanac (2004, 2005)

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Observing Scales

Standard ALPO Scale of Intensity:
- 0.0 = Completely black
- 10.0 = Very brightest features
- Intermediate values are assigned along the scale to account for observed intensity of features

ALPO Scale of Seeing Conditions:
- 0 = Worst
- 10 = Perfect

Scale of Transparency Conditions:
- Magnitude of the faintest star visible near Jupiter when allowing for moonlight and twilight

IAU directions are used in all instances (so that Jupiter rotates from west to east).

Table 2: A Summary of Contributors to the 2006-07 Jupiter Apparition Report[a, b]

Name; location (type of observation)	Name; location (type of observation)	Name; location (type of observation)
B. Adcock, Australia (I)	R. Heffner, Japan (I)	D. Parker, USA (I)
J. Adelaar; The Netherlands (I)	R. Hill, USA (I)	T. Parker, USA (I)
T. Akutsu; Philippines (I)	T. Ikemura, Japan (I)	D. Peach, Barbados and UK (I)
A. Amorim (I)	J. Irby (I)	C. Pellier, France (I)
K. Ando; Japan (I)	R. Jakiel, USA (I)	J. Phillips, USA (I)
T. Arampatzoglou, Greece (I)	M. Kardasis, Greece (I)	M. Phillips, USA (I)
D. Arditti; UK (I)	J. Kazanas, Australia (I)	D. Pires, Brazil (I)
T. Ashcraft, USA (R)	A. Kazemoto, Japan (I)	Z. Pujic, Australia (I)
G. Bertrand; France (I)	C. Kean (I)	D. Pye, Canada (I)
M. Boschat, Canada (D, DN)	B. Kingsley, UK (I)	E. Rivera, USA (I)
R. Bosman; The Netherlands (I)	M. Koishikawa, Japan (I)	S. Robbins, USA (I)
F. Carvalho; Brazil (I)	R. Korn, Germany (D, DN)	J. Rogers, UK (DN)
P. Casquinha; Portugal (I)	T. Kumamori, Japan (I)	J. Rosa, Argentina (I)
D. Chang; Hong Kong, China (I)	P. Lazzarotti, Italy (I)	C. Roussell, Canada (D, DN)
G. Chester; USA (I)	F. Leung, Hong Kong, China (I)	M. Salway, Australia (I)
W. Chin (I)	D. Llewellyn, USA (I)	J. Sanchez; Spain (I)
B. Colville, Canada (I)	K. Loh (I)	J. Sandel, USA (D, DN, TT)
R. Contreras, Argentina (I)	E. Lomeli, USA (I)	G. Santacana, USA (D, I)
B. Cudnik, USA (I)	M. Luca (I)	R. Schmude, Jr.; USA (D, DN, PP)
J. Davidson, Brazil (I)	C. MacDougal, USA (D, DN, TT)	P. C. Sherrod, USA (I)
M. Delcroix, France (I)	M. Masek (I)	J. Strikis, Greece (I)
B. Dickinson, USA (I)	M. Mattei, USA (I)	J. Sussenbach, The Netherlands (I)
P. Edwards, UK (I)	P. Maxson, USA (I)	K. Szeto, Hong Kong, China (I)
S. Eguivar, USA (I)	C. Mazzotti, Italy (I)	I. Takimoto, Japan (I)
H. Einaga, Japan (I)	F. Mazzotti, Italy (I)	G. Tarsoudis, Greece (I)
C. Fattinnanzi, Italy (I)	J. McAnally, USA (DN)	A. Tasselli, UK (DN)
D. Fell, Canada (I)	A. Medugno, Italy (I)	R. Tatum, USA (I)
M. Filoreto (I)	T. Mishina, Japan (I)	C. Tortonese, Argentina (I)
H. Fukui, Japan (I)	I. Miyazaki, Japan (I)	D. Tyler, UK (I)
J. García, Spain (I)	R. Mollise, USA (I)	M. Valimberti, Australia (I)
S. Ghomizadeh, Iran (I)	D. Moore, USA (I)	R. Vandebergh, The Netherlands (I)
A. Gioiosa, Italy (I)	E. Morales, USA (I)	R. Venable, USA (DN)
C. Go, Philippines (I)	New Horizons[c] (I)	S. Walker, USA (I)
G. Grassmann, Brazil (I)	E. Ng, Hong Kong, China (I)	R. Walls, USA (I)
N. Guidoni, Italy (I)	Nicolas, Canada (I)	J. Warren, USA (I)
B. Haberman, Jr.; USA (I)	D. Niechoy, Germany (D)	A. Wesley, Australia (I)
P. Haese, Australia (I)	G. Nowell, USA (DN)	D. Wrasse (I)
J. Hatton, The Netherlands (I)	T. Olivetti, Thailand (I)	B. Yeung, Hong Kong, China (I)
T. Hayashi, Japan (I)	J. Ortega, Spain (I)	S. Yoneyama, Japan (I)
A. Heath, UK (DN) (I)	P. Ostrowski, USA (I)	K. Yunoki, Japan (I)
C. Hedgepeth, USA (DN)	L. Owens, USA (I)	

[a] Type of observation: D = drawing, DN = descriptive notes, I = image, PP = photoelectric photometry, R = radio studies and TT = transit times
[b] All people who submitted images to *http://www.arksky.org* in the ALPO Jupiter archive are acknowledged in this table. People whose images are posted on the ALPO Japan Latest website and that were used in this study are also acknowledged in this table.
[c] Image credit: I. de Pater, P. Marcus, M. Wong, X. Assy-Davis, C. Go

Table 3: Relative Light Intensities of Selected Areas on Jupiter[a] in Blue, Green, Red and Methane Band Images. (2006-07 Apparition)

Time interval	Blue light	Green light	Red light	0.889 μm light
February–April	NEB = SEB-NC	NEB < SEB-NC	NEB < SEB-NC	NEB < SEB-NC
February–April	SEB-NC = SEB-SC	SEB-NC = SEB-SC	SEB-NC = SEB-SC	SEB-SC < SEB-NC
February–April	NTrZ < STrZ	NTrZ < STrZ	NTrZ < STrZ	NTrZ = STrZ
May–July	NEB < SEB-NC	NEB < SEB-NC	NEB < SEB-NC	NEB < SEB-NC
May–July	SEB-NC < SEB-SC	SEB-NC < SEB-SC	SEB-NC < SEB-SC	SEB-NC = SEB-SC
May–July	NTrZ < STrZ	NTrZ < STrZ	NTrZ < STrZ	STrZ < NTrZ

[a] The greater the light intensity, the brighter is the feature. All methane-band images were made at a wavelength of 0.889 m.

between January and August. The average light intensities based on the ALPO scale (0 = black and 10 = white) are: SPR (6.1), STB (4.9), STrZ (8.2), SEB-south component (5.1), SEBz (5.6), SEB-north component (5.5), EZs (7.3), EB (5.2), EZn (7.7), NEB (4.1), NTrZ (7.4), NTB (5.5), NTZ (6.4) and NPR (6.1).

The writer also estimated the relative intensities of different features in images made in red, green, blue and 0.889 μm (methane-band) light. Relative intensity estimates were made in each of the six 60°–longitude intervals (System II) starting with the 0° to 60° interval. Intensity estimates were made in each longitude interval to insure that conclusions were not made based on just one longitude of a belt or zone. This was done during the February-to-April and May-to-July time periods. Average values of the six values were then computed. Relative intensities are summarized in Table 3.

The writer measured latitudes of Jovian features from images made in May 2007. Latitudes were measured using the procedure described in Peek (1981, 49). Latitudes were measured from images in each of the six 60°–longitude intervals (System II) starting with the 0° to 60° interval. Average longitudes were then computed and are listed in Table 4 (visible wavelengths) and Table 5 (methane-band wavelength).

Table 4: Belt Latitudes (visible light)

Feature	Latitude	Feature	Latitude
SPBs	69.6° S ± 1°	SPBn	65.1° S ± 1°
STBs	30.8° S ± 0.5°	STBn	28.0° S ± 0.5°
SEBs	20.3° S ± 0.5°	SEBn	8.3° S ± 0.5°
EBc	2.2° S ± 0.5°	NEBs	7.5° N ± 1°
NEBn	18.5° N ± 1°	NTBs	23.2° N ± 1°
NTBn	26.8° N ± 1°	NNTBs	34.8° N ± 1°
NNTBn	39.3° N ± 1°		

Table 5: Belt and Zone Latitudes (methane band, 0.89 μm light)

Feature	Latitude	Feature	Latitude
SPCn	66.7° S ± 1°	STrZs	28.4° S ± 1°
SEBs	20.8° S ± 1°	SEBn	4.1° S ± 0.5°
NEBs	7.8° N ± 1°	NEBn	18.2° N ± 1°
NTBs	23.4° N ± 1°	NTBn	27.9° N ± 1°
NNTBs	34.5° N ± 1°	NNTBn	37.9° N ± 1°
NPCs	66.6° N ± 1°		

Table 6 lists dimensions of several white oval features. In all cases, measurements were made by the writer using the same method as in Schmude (2002, 26). Most of the values in Table 6 are average values of measurements made from four different images.

Figures 1 and 2 show a selection of drawings and images made of the planet. Figure 3 shows images of a festoon jump, the circulating current in the STrZ and a transit of Ganymede. Figures 4 and 5 show graphs of the longitude versus the date for many features on Jupiter.

Tables 7 through 9 list the planetograhic latitudes and drift rates of features on Jupiter. Table 10 summarizes wind speeds for over a dozen currents. Tables 11 and 12 summarize whole-disk photometric measurements of Jupiter.

Most feature names in this report have a letter followed by a number. The letters and respective currents are “A” (anything south of the SSTC), B (SSTC), C (STC), D (STrC and SEBC including jet streams), “E” (NEC), “N” (NTrC and NEBC), “F” (NTC including jet streams), “H” (NNTC jet stream), “G” (NNTC and N^{3}TC), “I” (N^{4}TC and anything farther north). Features in the circulating current have three letters in their names. The CCN and CCS stand for Circulating Current North end and Circulating Current South end, respectively. Each spot in a given current is assigned a number that is added after the letter. With the exception of Oval BA and the Great Red Spot, feature names are re-assigned in each new apparition. For example, feature B1 in the 2006-07 apparition is probably not the same feature as B1 in the previous apparition.

Region I: Great Red Spot

Figures 1F, 2C – 2F and 3G – 3I show the general appearance of the GRS. The GRS was consistently darker in blue filter images than in red filter images. This is consistent with it reflecting more red than blue light. The GRS was also consistently bright in methane band images, which is evidence that this feature extends to high altitudes.

The GRS had areas of 185 million km^2 and 172 million km^2 in visible and methane-band light, respectively. These areas are lower than in previous years. In methane band light (1998-2007), the area of the GRS shrunk at a rate of about 0.1% to 0.2% per year while in visible light (1952 to 2007), it shrunk at a rate of about 1% per year. This value is based on the equation:

$$\text{Shrinkage rate in area/year (\%)} = [1.0 - (A1/A2)^{\Delta Y}] \times 100\% \qquad (1)$$

In this equation, $\Delta Y = 1/55$, the reciprocal of the time difference in years between 1952 and 2007; A2 is the area in 1952, 365 million km^2; and A1 is the area in 2007, 172 million km^2. The 1952 area was measured from an Oct. 24, 1952, blue-filter photograph (Rogers, 1995, plate P9). This is consistent with the 100-year trend of shrinkage of the GRS (Rogers, 1995, 192; 2008b, 15).

The System II drift rate of the GRS in 2007 was 2.0°/30 days. This is about three standard deviations higher than the average drift rate of 18 apparitions between 1987 and 2006, which is 0.7°/30 days with a standard deviation = 0.4°/30 days. Data were taken from (Rogers, 1991, 25; 1992, 332; 1994, 172), (Rogers et al, 2004, 202), (Rogers and Foulkes, 1994, 172; 2001, 71), (Schmude, 2002, 31; 2003a, 47; 2003b, 47-48; 2003c, 56; 2004, 38; 2005a, 31; 2005b, 28; 2007a, 42; 2007b, 36; 2008a, 40; 2009a, 33; 2009b, 35), (Schmude and McAnally, 2006, 51 and 57). The 2007 drift rate is also higher than those between 1939 and 1990 (Rogers, 1995, 192). The unusual rate in 2007 may be due to the fading of the SEB. During the 1991-92 and 1992-93 apparitions, the SEB faded and the GRS drift rate was about 1.2°/30 days (Rogers and Foulkes, 1994, 172) (Schmude, 2002, 31; 2003c, 56) which is higher than the 1987-2006 average.

Between May 21 and June 20, the average longitude of the GRS was λ_{II} = 120.0° ± 0.4°. This is 8.7° further west than what it was at the corresponding date in the previous apparition.

Region II: South Polar Region to the South Tropical Zone

Estimating the intensity of the NPR and SPR is difficult because of 1) the low inclination of Jupiter's axis, and 2) defining the extent of the NPR and SPR. In this paper, the NPR and SPR refer to the northerly and southerly 5% of the disc.

Table 6: Dimensions of White Ovals on Jupiter[a,b] (2006-07 Apparition)

Feature	Area (10^6 km^2)	Aspect	EW × NS Dimension (km)	Feature	Area (10^6 km^2)	Aspect	EW × NS Dimension (km)
A7	10 ± 2	0.92	3800 × 3500	A2	15 ± 3	0.86	4700 × 4000
A5	7 ± 2	0.77	3300 × 2500	A6	8 ± 2	0.87	3400 × 3000
B1	11 ± 2	0.94	3900 × 3700	B2	19 ± 3	0.77	5500 × 4300
B3	15 ± 3	0.80	4800 × 3900	B4	14 ± 3	0.80	4800 × 3800
B5	16 ± 3	0.74	5200 × 3800	B6	18 ± 3	0.78	5400 × 4200
B7	32 ± 4	0.62	8100 × 5000	B9	7 ± 2	0.74	3400 × 2500
B11	12 ± 2	0.80	4400 × 3500	B12	7 ± 2	0.83	3300 × 2800
B13	20 ± 3	0.83	5500 × 4600	Oval BA	94 ± 7	0.58	14,400 × 8300
C2	6 ± 2	0.67	3400 × 2300	GRS	185 ± 8	0.65	19,100 × 12,400
F1	19 ± 3	0.62	6200 × 3900	G1	14 ± 2	0.69	5200 × 3500
G2	4 ± 1	0.89	2500 × 2200	G3a	11 ± 2	0.66	4600 × 3000
G5	40 ± 4	0.74	8300 × 6200	I4	8 ± 2	0.88	3500 × 3100
GRS 0.889 μm	172 ± 9	0.64	18,500 × 11,800	Oval BA 0.889 μm	36 ± 4	0.77	7700 × 6000

[a] The aspect is the North-South (NS) dimension divided by the East-West (EW) dimension. Areas are computed in the same way as in Schmude, 2009b.

[b]Uncertainties are 500 km for the NS and EW dimensions.

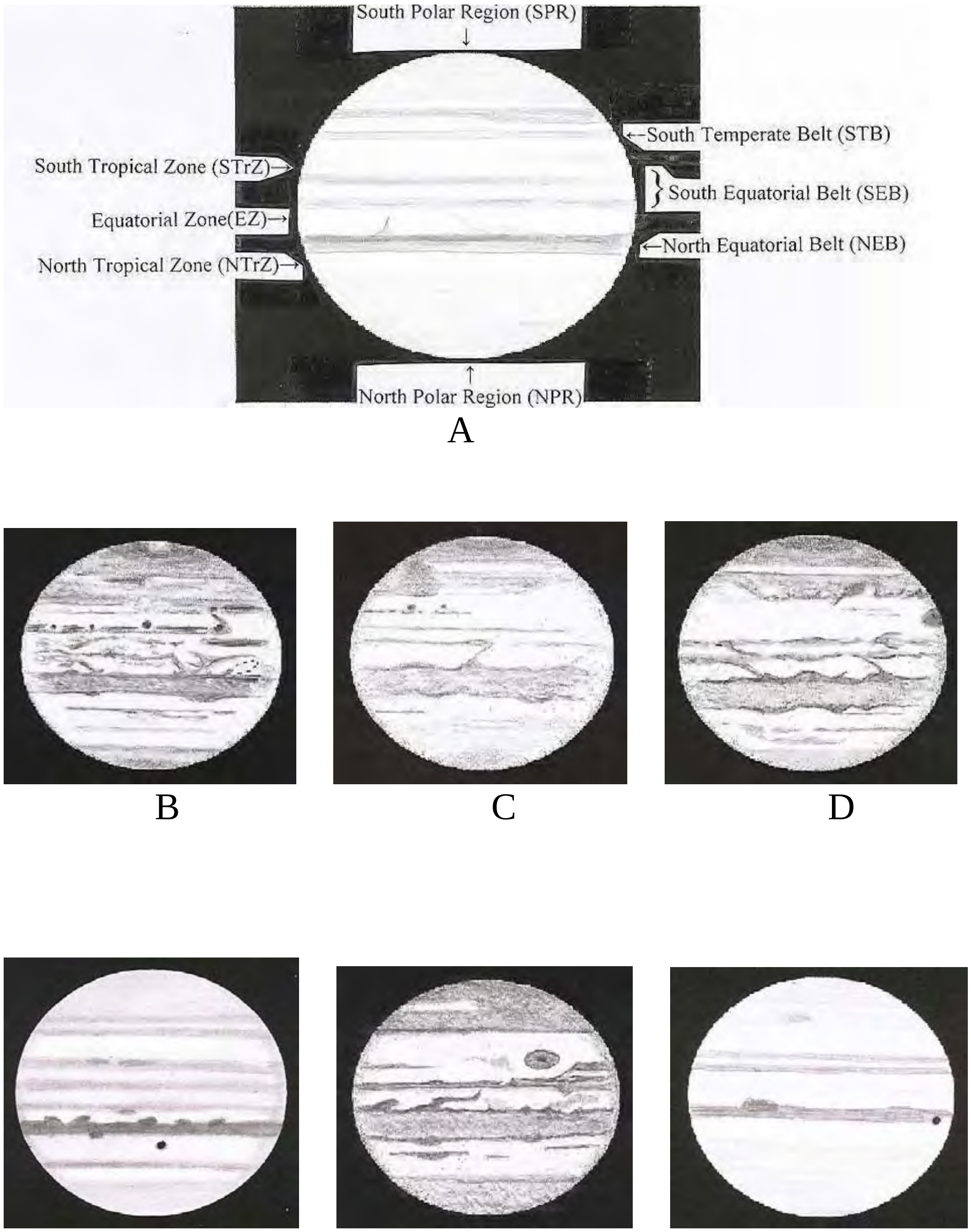

Figure 1: Drawings of Jupiter made in 2007. South is at the top for all drawings. The preceding limb is to the left for drawings A, E, G and is to the right for the other four drawings. The longitudes of the central meridian correspond to the end-time of the drawings. A: July 13 (4:30 UT) by Brian Cudnik, 0.20 m (8 inch) Schmidt-Cassegrain, seeing = 8-10, no filters, λ_{I} = 122°, λ_{II} = 359°; B: July 6 (1:50 UT) by Jeffery Sandel, 0.25 m (10 inch) reflector, seeing = 8, no filters, λ_{I} = 5°, λ_{II} = 296°; C: July 11 (2:15 UT) by Jeffery Sandel, 0.25 m (10 inch) reflector, seeing = 7, no filters, λ_{I} = 90°, λ_{II} = 343°; D: July 16 (3:37 UT) by Jeffery Sandel, 0.25 m (10 inch) reflector, seeing = 7-8, #15, #82A filters, λ_{I} = 208°, λ_{II} = 62°; E: Aug. 1 (2:28 UT) by Carl Roussell, 0.15 m refractor, seeing = 5, #80A filter and integrated light, λ_{I} = 173°, λ_{II} = 265°; F: Aug. 22 (0:43) by Jeffery Sandel, 0.25 m (10 inch) reflector, seeing = 6-7, #82A filter, λ_{I} = 182°, λ_{II} = 115°; G: Oct. 13 (1:25 UT) by Brian Cudnik, 0.44 m (17.5 inch) reflector, seeing = 5-7, no filters, λ_{I} = 125°, λ_{II} = 20°.

This corresponds to the latitude of ~64°. In spite of the low tilt of Jupiter's axis, I have attempted to estimate the relative intensity of the NPR and SPR. In methane band light, both polar regions are bright and the SPR is brighter than the NPR. In a series of high-resolution images of Jupiter made by Damian Peach (May 27, 2007 at 4:26 UT), the NPR is darker than the SPR in red and green light. The reverse, however, is the case in blue light. Therefore the SPR may have been a bit redder than the NPR in late May. The NPR is darker than the SPR in a February 17, 2007 "true-color view" made with the Hubble Space Telescope.

The South Polar Belt (SPB) was between 65.1° S and 69.6° S. This belt was at about the same latitude as in the previous apparition. The writer observed this belt on July 10, 2007, with a 0.12 m refractor. It was 0.5 intensity units darker than the areas to the north and south. This belt shows up in several drawings including a June 20, 1983, drawing made by Isao Miyazaki (Rogers, 1995, plate P22), a 1995 drawing of Jupiter's South Polar Region (Rogers and Foulkes, 2001, 68) and in a February 13, 1979, drawing made by John Rogers (Rogers, 1995, plate P17, number 3).

One white oval (A7) was in the SPB. It was centered at 66.4° S and it had a System II drift rate of -69.5°/30 days. The wind speed of A7 was 12.5 m/s that is a bit lower than winds at a planetographic latitude of 66.4° S (García-Melendo and Sánchez-Lavega, 2001, 324). This oval had an area of 10 million km^2 that is similar to the areas of features A1 and A6 during the 2005-06 apparition (Schmude, 2009b, 32).

There are large uncertainties in the measurement in longitude and latitude of features in the polar regions. As a result, the characteristics of the jet streams in these areas from one year to the next are not well established. Therefore, there is presently no standard way of naming currents south of about 57° S. A temporary current name of South Polar Current at 66° S or (SPC at 66° S) will be assigned to A7. Features at other latitudes south of about 57° S will be named according to their latitude until standard nomenclature is established (Rogers, 2010).

Four white ovals (A1, A2, A3 and A6) were centered near 61° S and, hence, were in the SPC at 61° S. The average value of the System II drift rate of these four features is -10.3°/30 days. Rogers et al (2008, 205) report a System II drift rate of 0°/30 days for a single white oval at 59° S during 2001-02. In a second paper, Rogers et al (2004, 202) report a System II drift rate of -17°/30 days for a white spot at 59.4° S. Schmude (2009b, 35) reports an average System II drift rate of -4.7/30 days for three features (A1, A3, A6) near 61° S in 2005-06.

Four white ovals (A4, A5, A9 and A10) had latitudes consistent with the S^{3}TC. The average System II drift rate of these features is -10.3°/30 days. This is consistent with the historical record (Rogers, 1995, 240), (Peek, 1981, 132).

Twelve white ovals (B1 – B7, B9 – B13) followed the SSTC. Their average System II drift rate, -26.8°/30 days, is consistent with the historical record (Rogers, 1995, 238-239), (Peek, 1981, 131). The average area and aspect of B1 – B7, B9, and B11 – B13 is 16 ± 2 million km^2 and 0.79 ± 0.02, respectively. This is a bit higher than the corresponding values in 2006 (Schmude, 2009b, 34).

The two white ovals C2 and C5, the dark spot C3 and Oval BA have latitudes consistent with the STC. The average drift rate of these four features, -7.3°/30 days is consistent with the historical record (Peek, 1981, 118-119). The 2007 drift rate of C3, however, was 4.2°/30 days which is different from the historical drift rate for the STC (Peek, 1981, 118-119).

Oval BA continued to remain large in 2007. Its area was 94 million km^2. This is similar to its area in 2006. Simon-Miller and co-workers (2006, 560) report that the winds inside of Oval BA increased between 1979 and 2006. The higher winds may have been responsible for the large size of this feature in 2006 and 2007.

A circulating current developed at λ_{II}~260°-320° during July. This current continued into August. The average System II drift rate of the nine dark spots CCS0 – CCS5 and CCS7 – CCS8 along the southern edge of the circulating current is -74.1°/30 days. This corresponds to a rotation period of 9h 54m 00s. The average System II drift rate of nine dark spots CCN3 – CCN10 along the northern edge of the circulating current is 115.8°/30 days. This corresponds to a rotation rate of 9h 58m 20s. Peek (1981, 183) reports average rotation periods of 9h 53m 02s and 9h 58m 43s for the south and north ends of the circulating current respectively. His averages are based on circulating currents studied between 1919 and 1938.

Region III: South Equatorial Belt

The SEB underwent a great deal of change in 2007. In early 2007, it was a single, wide belt with a thin SEBz at some longitudes (See figures 2A – 2E). Between February and April, the South Equatorial Belt-North Component and South Equatorial Belt-South Component (hereafter SEB-NC and SEB-SC) were of equal intensity in visible light (See Table 3). By late April, the SEB-SC preceding the GRS began to fade (See Figure 3A). This fading is consistent with a prediction made by Rogers (2007a, 114). By July, both the SEB-SC and SEB-NC were narrow and were separated by a wide SEBz (See figures 3D – 3F). During mid-2007, the SEB-NC was darker than the SEB-SC (See Table 3). In August, the two components in the SEB became wider at some longitudes but remained narrow at others (See figures 2H and 2I).

In visible wavelengths, the south edge of the SEB shifted from 23.6° S (2006) to 20.3° S (2007). This shift resulted in the thinning of the SEB by 3° in 2007.

A series of small dark spots (D13 – D17) at the southern border of the SEB-SC (or SEBs) developed in June. These spots followed the South Equatorial Belt Jetstream or "SEBs jet stream". The average System II drift rate for this current is 110.1°/30 days. This rate is consistent with the historical record for this current (Rogers, 1995, 161).

Several dark spots (or barges; D3 – D12) developed at a planetographic latitude of 17° S to 19° S. Unlike the GRS and STrC features, barges D3 – D13 were within the SEB. I have labeled these features as "South Equatorial Belt Current barges" or SEBC barges. Features D3 – D12 have an

Table 7: Drift Rates of Features South of the Equatorial Zone (2006-07 Apparition)

Feature	Number of Points	Planetographic Latitude	Drift Rate Deg./30 days System II	Feature	Number of Points	Planetographic Latitude	Drift Rate Deg./30 days System II
South Polar Current at 66° S (SPC at 66° S)							
A7	23	66.4° S	-69.5				
South Polar Current at 61° S (SPC at 61° S)							
A1	9	61.3° S	-19.2	A2	48	60.6° S	3.0
A3	5	61.0° S	-25.3	A6	13	61.3° S	1.7
Average		61.1° S	-10.0				
South South South Temperate Current (S^3TC)							
A4	13	51.8° S	-42.2	A5	11	53.2° S	-26.2
A9	7	50.0° S	18.8	A10	7	50.0° S	8.6
Average		51.3° S	-10.3				
South South Temperate Current (SSTC)							
B1	34	41.7° S	-27.2	B2	23	41.5° S	-28.2
B3	64	41.6° S	-27.5	B4	58	41.4° S	-27.7
B5	61	41.7° S	-28.5	B6	64	41.5° S	-26.8
B7	59	40.0° S	-26.2	B9	13	41.0° S	-22.5
B10	9	38.8° S	-23.5	B11	51	43.2° S	-29.3
B12	34	42.3° S	-26.1	B13	40	42.3° S	-28.3
Average		41.4° S	-26.8				
South Temperate Current (STC)							
Oval BA	63	34.3° S	-13.8	C2	25	34.3° S	-11.4
C3	16	33.2° S	4.2	C5	6	30.4° S	-8.2
Average		33.1° S	-7.3				
Circulating Current, south end (CCS)							
CCS0	6	27.4° S	-85.8	CCS1	6	27.4° S	-99.9
CCS1a	6	27.4° S	-58.3	CCS2	19	27.4° S	-60.7
CCS3	9	27.4° S	-90.7	CCS4	16	27.4° S	-73.9
CCS5	14	27.4° S	-83.9	CCS7	12	27.4° S	-60.8
CCS8	6	27.4° S	-52.7				
Average		27.4° S	-74.1				
Circulating Current, north end (CCN)							
CCN3	6	20.3° S	109.2	CCN4	6	20.3° S	117.2
CCN5	8	20.3° S	125.9	CCN6	8	20.3° S	123.2
CCN7	10	20.3° S	128.8	CCN8	5	20.3° S	109.1
CCN8a	3	20.3° S	96.0	CCN9	4	20.3° S	114.8
CCN10	9	20.3° S	118.0				
Average		20.3° S	115.8				

average System II drift rate of -5.6°/30 days. This rate is close to the STrC in this report.

Region IV: Equatorial Zone

Heath described the EZ as "dull". Roussell usually described the EZ as either gray or yellow. On June 18, he also noted that the EZs was darker than the EZn. Sandel reported that the EB was visible but very thin and faint on September 24. During early 2007, the EZ was darker than later in the year (Compare Figure 2B with Figure 2I).

A narrow Equatorial Band (EB) was often visible after July 1 (See figures 1B – 1E and figures 2E – 2I). The EB was centered at 2.2° S. This is close to its position of 3.5° S in 2006 (Schmude, 2009b, 31).

Drift rates for 22 festoons in the NEC are summarized in Table 8. The average System I drift rate for these features is 1.1°/30 days. This rate is consistent with the historical record of this current (Rogers, 1995, 144-145).

Several of the festoons underwent changes during this apparition. The most common change is what I call a "festoon jump." The steps in a festoon jump are: 1) a festoon becomes wider, 2) a new festoon develops about 10° to 20° from the original festoon, and 3) the old festoon disappears, leaving behind the new festoon. Such an event took place between May 9 and May 21 at $\lambda_I \sim 40°$. During this time, festoon E14 turned into E14a (See figures 3A – 3C). Two other festoon jumps took place at $\lambda_I \sim 100°$ and $\lambda_I \sim 350°$ in late April.

Region V: North Equatorial Belt

The NEB was the darkest belt on Jupiter in blue, green and red light between February and August. The NEB was darker than the SEB-NC (See Table 3). Roussell described the NEB as having a brown or red-brown color. This belt had a width of 11° in May 2007 that is lower than in 2006. The narrow width is due to the southward shift of the north edge of the NEB.

Five white ovals (N1 – N5) were along the northern edge of the NEB. These features often appeared as white indentations in the NEB (instead of portholes). Features N1 – N5 followed the NTrC. The average System II drift rate of these features is -0.4°/30 days. This rate is a bit different than the average rate of the NTrC which is $\Delta\lambda_{II} = \sim -10°/30$ days (Rogers, 1995, 114-115) (Peek, 1981, 99-100).

Region VI: North Tropical Zone to the North Polar Region

Parts of the NTB re-appeared during 2007. Sandel drew part of this feature on July 6 (See Figure 1B). The writer also observed the NTB on July 10 and described it as being light gray with sharp borders. On July 24 and August 30, however, Sandel drew only part of this belt. Images generally show a continuous NTB after July 1 (See Figures 2G – 2I).

Two white spots (F1 and F2) followed the NTBC, Current D. The average System I drift rate of these two features is -160.5°/30 days. This is consistent with a rotation rate of 9h 46m 55s. Rogers (1995, 107) reports that this current developed several times between 1970 and 1990. He reports an average rotation period of 9h 46m 51.9s for the NTBC, Current D which is consistent with the result in 2007.

Table 7: Drift Rates of Features South of the Equatorial Zone (2006-07 Apparition) (Continued)

Feature	Number of Points	Planetographic Latitude	Drift Rate Deg./30 days System II	Feature	Number of Points	Planetographic Latitude	Drift Rate Deg./30 days System II
South Tropical Current (STrC)							
GRS	70	24.1° S	2.0	D1	31	20.6° S	-8.8
D2	65	20.9° S	-6.2				
Average		21.9° S	-4.3				
South Equatorial Belt Jetstream (SEBs jetstream)							
D13	9	21.9° S	118.1	D14	10	21.4° S	119.2
D15	5	20.4° S	114.2	D16	7	21.9° S	94.0
D17	6	22.3° S	104.9				
Average		21.6° S	110.1				
South Equatorial Belt Current barges (SEBC barges)							
D3	60	18.5° S	7.9	D4	5	18.6° S	10.9
D4a	26	17.0° S	-8.7	D5	24	17.6° S	8.7
D6	17	18.9° S	9.6	D7	7	18.9° S	8.2
D8	7	18.4° S	1.5	D9	18	17.4° S	8.0
D10	15	17.5° S	0.0	D11	7	17.9° S	17.8
D12	7	17.8° S	-1.8				
Average		18.0° S	5.6				

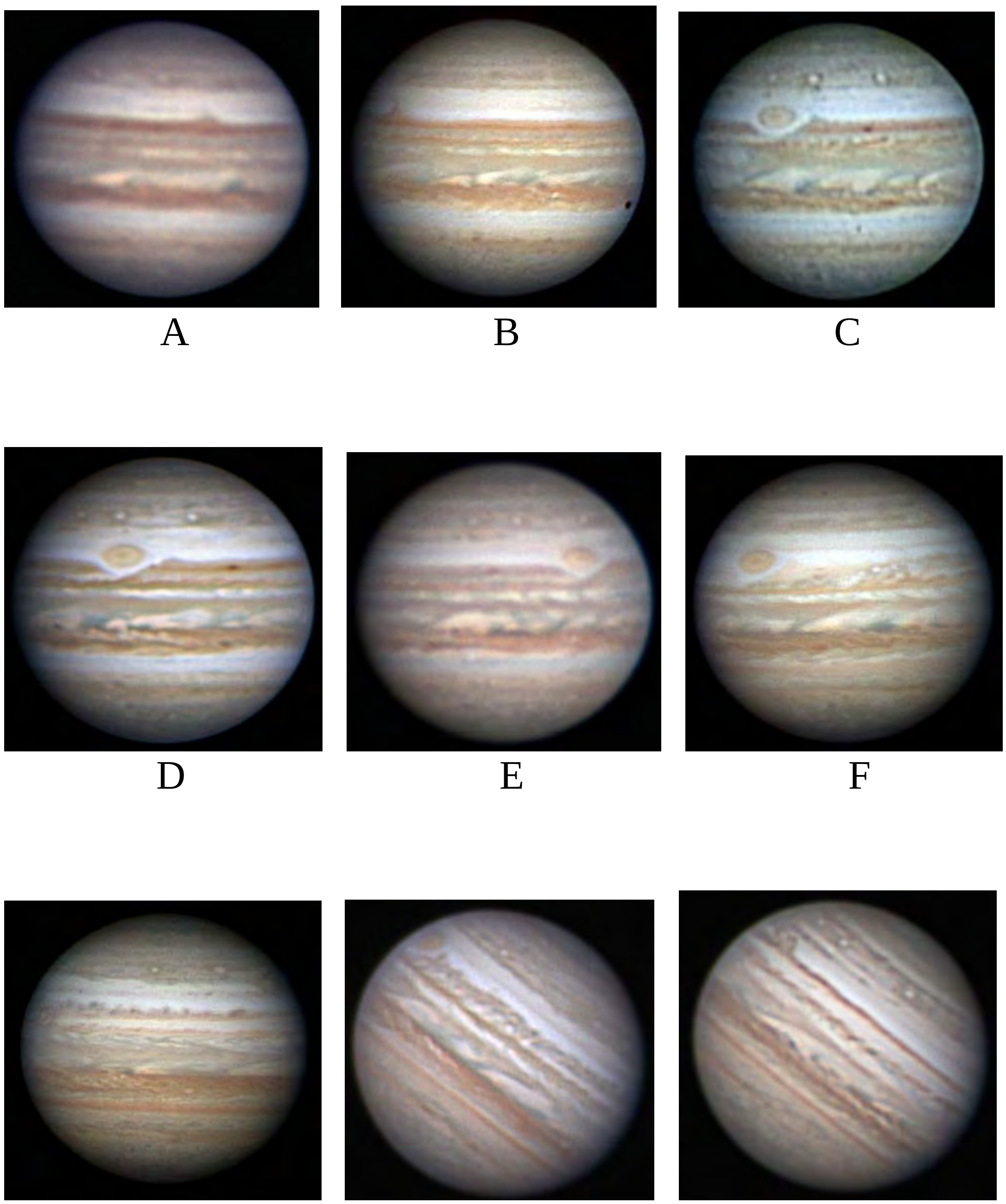

Figure 2: Images of Jupiter made in 2007. In all cases, south is at the top and the preceding limb is on the left. All images were made with RGB filters except where noted. A: Jan. 10 (18:22 UT) by Anthony Wesley, 0.33 m (13.1 inch) reflector, λ_I = 9°, λ_{II} = 205°; B: Feb. 17 (21:32 UT) by Christopher Go, 0.28 m (11 inch) Schmidt-Cassegrain, λ_I = 1°, λ_{II} = 266°; C: Feb. 22 (7:16 UT) by Fabio Carvalho, 0.25 m (10 inch) reflector, λ_I = 268°, λ_{II} = 140°; D: Mar. 13 (17:38 UT) by Anthony Wesley, 0.33 m (13.1 inch) reflector, λ_I = 47°, λ_{II} = 130°; E: Apr. 3 (8:10 UT) by Don Parker, 0.25 m (10 inch) Mewlon, λ_I = 138°, λ_{II} = 64°; F: June 18 (13:13 UT) by Christopher Go, 0.28 m (11 inch) Schmidt-Cassegrain, λ_I = 92°, λ_{II} = 156°; G: July 3 (13:01 UT) by Christopher Go, 0.28 m (11 inch) Schmidt-Cassegrain, λ_I = 295°, λ_{II} = 244°; H: Aug. 8 (1:11 UT) by Don Parker, 0.41 m (16 inch) reflector, λ_I = 146°, λ_{II} = 185°; I: Aug. 14 (0:54 UT) by Don Parker, 0.25 m (10 inch) Mewlon, λ_I = 2°, λ_{II} = 356°.

Two dark spots (H1 and H2) followed the NNTBs Jetstream during part of February. These spots faded by early March and no further drift rates could be determined. The average System II drift rate of H1 and H2 is -81.5°/30 days. This value is consistent with values measured during the twentieth century (Rogers, 1995, 97), (Peek, 1981, 78).

The three white ovals (G1, G3a and G5) had latitudes consistent with the NNTC. The average System II drift rate of these three features is -11.5°/30 days. This rate is a bit more negative than most values recorded for this current in the 20th century (Rogers, 1995, 88-89), (Peek, 1981, 77). Three white ovals (G2, G3 and G6) followed the N^3TC. The average System II drift rate of these three features is -6.0°/30 days. This is a bit less negative than previous values (Rogers, 1995, 90).

One white oval (I4) had a latitude consistent with the N^4TC. Its System II drift rate is consistent with previous values (Rogers, 1995, 90).

Wind Speeds

Table 10 summarizes wind speeds. The wind speeds are with respect to the System III longitude. They were computed in the same way as in Rogers (1995, 392). Uncertainties were computed in the same way as in Schmude (2003a, 50).

Satellite Observations

Several people recorded images of satellite transits across Jupiter. Carvalho recorded a transit of Europa on February 22. One end of Europa was darker than the other end. This is most likely a phase effect (Rogers, 2007a, 114). Lomeli, Delcroix, Arditti and Salway recorded transits of Ganymede. That moon was brighter than the region of Jupiter around 50° – 55° N on June 9, July 7 and July 22. This is consistent with a June 27, 2006 image by Don Parker (Schmude 2009b, 38). Ganymede, however, was darker than all Jovian features, including areas at 50°-55° N, in images made during the 1997, 1998, 2001-02, 2002-03, 2003-04 and 2004-05 Jupiter apparitions (Schmude and McAnally, 2006, 51), (Schmude, 2003a, 48; 2007b, 33; 2008a, 45; 2009a, 31). Three images of a Ganymede transit in blue, green and red light are shown in Figures 3G through 3I.

The Hubble Space Telescope recorded images of Jupiter's moon Io in February of 2007 in both visible and ultraviolet light. The visible light image shows orange areas on that moon but no volcanic plumes. The ultraviolet image, however, shows a large volcanic plume extending about one-tenth of Io's diameter above that moon's northern limb. The writer believes that people with the appropriate equipment under excellent skies may be able to image plumes on Io in ultraviolet light.

Photoelectric Photometry

The writer used an SSP-3 solid-state photometer along with a 0.09 m (3.5 inch) Maksutov telescope and color filters transformed to the Johnson B, V, R and I system in making all brightness measurements in Table 11. The method and equipment are described elsewhere (Schmude, 1992, 20; 2008b, 161-167), (Optec, 1997). All measurements were corrected for both atmospheric extinction and color transformation in the same way as in Hall and Genet (1988, Chapter 13). The comparison star for all measurements was beta Ophiuchi. Its brightness values are from Iriarte et al, (1965, 29).

Normalized magnitudes, $X(1,\alpha)$, were computed in the same way as in Schmude and Lesser (2000, 68-69); X represents the B, V,

Table 8: Drift Rates of Festoons in the Equatorial Current and Features in the North Temperate Current D (2006-07 Apparition)

Feature	Number of Points	Planetographic Latitude	Drift RateDeg./30 days System I	Feature	Number of Points	Planetographic Latitude	Drift Rate Deg./30 Days System I
North Equatorial Current, festoons (NEC)							
E1	6	7.5° N	-3.4	E2	7	7.5° N	4.8
E3	12	7.5° N	6.1	E4	31	7.5° N	-3.3
E5	16	7.5° N	0.0	E6	28	7.5° N	-3.0
E7	13	7.5° N	-8.0	E8	72	7.5° N	-2.6
E9	25	7.5° N	0.5	E9a	13	7.5° N	7.8
E9b	9	7.5° N	-4.4	E10	24	7.5° N	4.2
E10a	23	7.5° N	6.3	E11	50	7.5° N	1.1
E12	19	7.5° N	15.0	E14	14	7.5° N	-6.0
E14a	24	7.5° N	-1.9	E15	13	7.5° N	2.0
E16	13	7.5° N	-4.8	E17	31	7.5° N	9.0
E20	25	7.5° N	4.5	E21	17	7.5° N	-0.5
Average		7.5° N	1.1				
North Temperate Belt Current, current D (NTBC, current D)							
F1	23	22.7° N	-161.3	F2	4	22.5° N	-159.6
Average		22.6° N	-160.5				

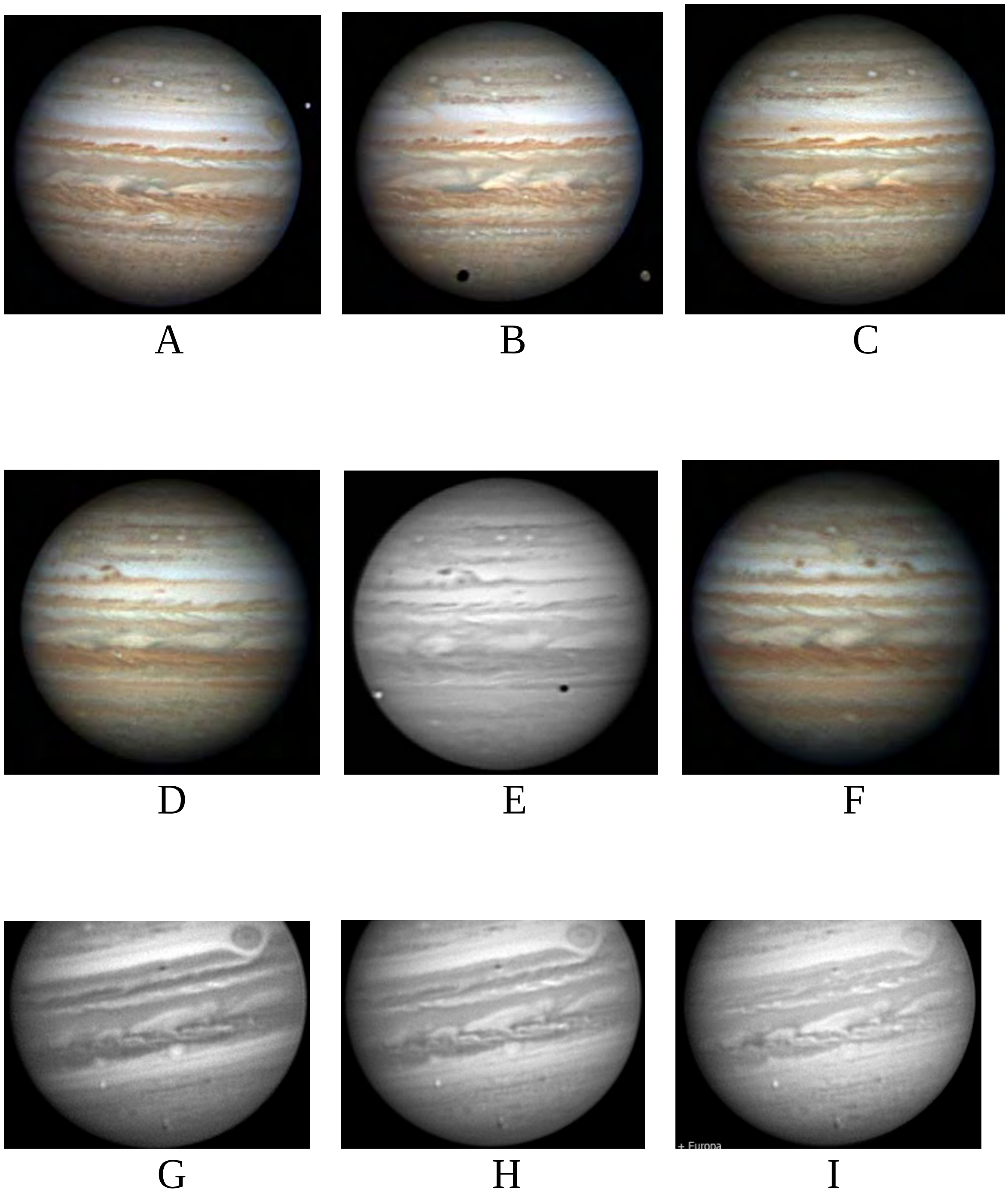

Figure 3: Images of Jupiter showing a festoon jump (A-C), the circulating current (D-F) and a transit of Ganymede (G-I). All images were made in 2007 with south at the top and the preceding limb on the left. A: May 9 (17:32 UT) by Christopher Go, 0.28 m (11 inch) Schmidt-Cassegrain, $\lambda_I = 49°$, $\lambda_{II} = 57°$; B: May 11 (17:34 UT) by Christopher Go, 0.28 m (11 inch) Schmidt-Cassegrain, $\lambda_I = 6°$, $\lambda_{II} = 359°$; C: May 21 (16:05 UT) by Christopher Go, 0.28 m (11 inch) Schmidt-Cassegrain, $\lambda_I = 92°$, $\lambda_{II} = 9°$; D: July 18 (13:01 UT) by Christopher Go, 0.28 m (11 inch) Schmidt-Cassegrain, $\lambda_I = 144°$, $\lambda_{II} = 339°$; E: July 21 (10:15 UT) by Maurice Valimberti, 0.36 m (14 inch) Schmidt-Cassegrain, $\lambda_I = 156°$, $\lambda_{II} = 330°$; F: July 23 (10:46 UT) by Christopher Go, 0.28 m (11 inch) Schmidt-Cassegrain, $\lambda_I = 131°$, $\lambda_{II} = 289°$; G: Mar 22 (18:22:30 UT) by Mike Salway, 0.30 m (12 inch) reflector, blue filter $\lambda_I = 56°$, $\lambda_{II} = 70°$; H: Mar 22 (18:22:30 UT) by Mike Salway, 0.30 m (12 inch) reflector, green filter $\lambda_I = 56°$, $\lambda_{II} = 70°$; I: Mar 22 (18:22:30 UT) by Mike Salway, 0.30 m (12 inch) reflector, red filter $\lambda_I = 55°$, $\lambda_{II} = 70°$.

R or I filter. The X(1,α) and α values were fitted to linear equations using a least squares routine (Schmude and Lesser, 2000, 68-69). The resulting solar phase angle coefficients c_X and normalized magnitudes X(1,0) are summarized in Table 12. Uncertainties for the B, V, R and I filter results were computed in the same way as in Schmude (1998, 178-179).

The normalized magnitude or V(1,0) value of Jupiter was -9.37 ± 0.01. This is a bit dimmer than the average V(1,0) value between 1999 and 2006, -9.39 (Schmude and Lesser, 2000, 67), (Schmude, 2007a, 31; 2003a, 41; 2007b, 33; 2008a, 30; 2009a, 24; 2009b, 29). The 2007 value was undoubtedly influenced by the grayish EZ. Most of the brightness measurements were made when the SEB was intact and, hence, the effect of a narrow SEB did not affect the 2007 V(1,0) value.

Radio Studies

Thomas Ashcraft reports that radio studies were difficult during 2007 due to Jupiter's orientation. In spite of this, Ashcraft detected radio emissions from Jupiter as Io passed on May 29, 2007 at 9:27 UT.

Acknowledgements

The writer is grateful to everyone who submitted observations during the 2006-07 apparition, including those people who submitted images to the ALPO Japan latest website (http://www.kk-system.co.jp/Alpo/latest/Jupiter.htm). He is also grateful to Sue Gilpin for her assistance and to Brian Sherrod who maintains the website http://www.arksky.org/.

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Table 9: Drift Rates of Features North of the Equatorial Zone (Excluding Features in the NTB Current D; 2006-07 Apparition)

Feature	Number of Points	Planetographic Latitude	Drift rate Deg./30 days System II	Feature	Number of Points	Planetographic Latitude	Drift rate Deg./30 days System II
North Tropical Current (NTrC ovals) or North Equatorial Belt Current, ovals							
N1	16	17.8° N	0.9	N2	46	18.5° N	-2.7
N3	53	18.0° N	-5.5	N4	7	16.7° N	6.4
N5	13	18.4° N	-1.3				
Average		17.9° N	-0.4				
North North Temperate Current B (NNTBs Jetstream)							
H1	5	35.4° N	-82.3	H2	6	35.4° N	-80.7
Average		35.4° N	-81.5				
North North Temperate Current (NNTC)							
G1	63	42.6° N	-11.3	G3a	19	42.1° N	-17.4
G5	17	40.9° N	-5.9				
Average		41.9° N	-11.5				
North North North Temperate Current (N^3TC)							
G2	20	45.4° N	-17.3	G3	9	43.5° N	-2.0
G6	6	44.4° N	1.2				
Average		44.4° N	-6.0				
North North North North Temperate Current (N^4TC)							
I4	19	53.5° N	5.0				

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Table 10: Average Drift Rates, Rotation Periods and Wind Speedsa for Several Currents on Jupiter (2006-07 Apparition)

Current	Feature(s)	Drift Rate (degrees/30 days)			Rotation Rate	Wind Speed (m/s)
		Sys. I	Sys. II	Sys. III		
SPC at 66° S	A7	159.4	-69.5	-61.5	9h 54m 06s	12.5 ± 2[b]
SPC at 61° S	A1-A3, A6	218.9	-10.0	-2.0	9h 55m 27s	0.5 ± 0.6
S^3TC	A4, A5, A9, A10	218.6	-10.3	-2.3	9h 55m 27s	0.7 ± 2.3
SSTC	B1-B7, B9-B13	202.1	-26.8	-18.8	9h 55m 04s	7.0 ± 0.2
STC	Oval BA, C2, C3, C5	221.6	-7.3	0.7	9h 55m 31s	-0.3 ± 0.8
CCS[c]	CCS0-CCS5, CCS7, CCS8	154.8	-74.1	-66.1	9h 54m 00s	28.6 ± 0.8
CCN[d]	CCN3-CCN10	344.7	115.8	123.8	9h 58m 20s	-56.2 ± 0.5
STrC	GRS, D1, D2	224.6	-4.3	3.7	9h 55m 35s	-1.7 ± 0.7
SEBs jetstream	D13-D17	339	110.1	118.1	9h 58m 12s	-53.2 ± 0.9
SEBC barges	D3-D12	223.3	5.6	13.6	9h 55m 48s	-6.3 ± 0.4
NEC	E1-E12, E14-E17, E20, E21	1.1	-227.8	-219.8	9h 50m 31s	104.8 ± 0.3
NTBC, current D	F1, F2	-160.5	-389.4	-381.4	9h 46m 55s	170.9 ± 2[b]
NTrC ovals	N1-N5	228.5	-0.4	7.6	9h 55m 40s	-3.5 ± 0.4
NNTBs jetstream	H1, H2	147.4	-81.5	-73.5	9h 53m 49s	29.4 ± 2[b]
NNTC	G1, G3a, G5	217.4	-11.5	-3.5	9h 55m 25s	1.3 ± 0.4
N^3TC	G2, G3, G6	222.9	-6.0	2.0	9h 55m 32s	-0.7 ± 0.6
N^4TC	I4	233.9	5.0	13.0	9h 55m 47s	-3.9 ± 2[b]

[a]The wind speed is the speed that a current moves with respect to the system III longitude; it is computed from the equation in Table A1.2 (Rogers, 1995, 392).

[b]Estimated uncertainty [c]Circulating Current south end [d]Circulating Current north end

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Table 12: Photometric Constants of Jupiter (2006 - 07 Apparition)

Filter	X(1,0)	c_x (magnitude/ degree)
B	-8.49 ± 0.05	0.003 ± 0.005
V	-9.37 ± 0.01	0.004 ± 0.002
R	-9.80 ± 0.02	0.0004 ± 0.005
I	-9.65 ± 0.02	-0.005 ± 0.004

Table 11: Photometric Magnitude Measurements of Jupiter (2006-07 Apparition)

Date (2007)	Filter	α (deg.)	Measured Magnitude	$X(1,\alpha)$	Date (2007)	Filter	a (deg.)	Measured Magnitude	$X(1,\alpha)$
Feb. 16.446	V	10.0	-1.92	-9.30	May 8.366	B	5.5	-1.64	-8.51
Mar. 17.388	V	10.7	-2.15	-9.35	May 8.390	R	5.5	-2.92	-9.79
Mar. 17.410	B	10.7	-1.25	-8.45	May 8.408	I	5.5	-2.83	-9.70
Mar. 17.423	R	10.7	-2.60	-9.79	May 18.323	V	3.7	-2.52	-9.35
Mar. 17.435	I	10.7	-2.51	-9.71	May 18.334	B	3.7	-1.67	-8.50
Apr. 13.363	V	9.1	-2.32	-9.34	May 18.400	R	3.7	-2.97	-9.80
Apr. 13.376	B	9.1	-1.44	-8.45	May 21.348	I	3.2	-2.82	-9.64
Apr. 17.373	R	8.6	-2.85	-9.83	May 21.362	V	3.2	-2.51	-9.34
Apr. 17.388	I	8.6	-2.74	-9.72	May 25.270	V	2.4	-2.55	-9.37
Apr. 29.279	V	7.0	-2.44	-9.36	May 25.283	B	2.4	-1.63	-8.44
Apr. 29.292	B	7.0	-1.55	-8.47	May 25.302	R	2.4	-3.00	-9.81
Apr. 29.307	R	7.0	-2.84	-9.76	May 25.313	I	2.4	-2.82	-9.64
Apr. 29.320	I	7.0	-2.71	-9.63	June 7.220	I	0.4	-2.86	-9.66
May 8.351	V	5.5	-2.50	-9.38	June 7.237	V	0.4	-2.58	-9.38

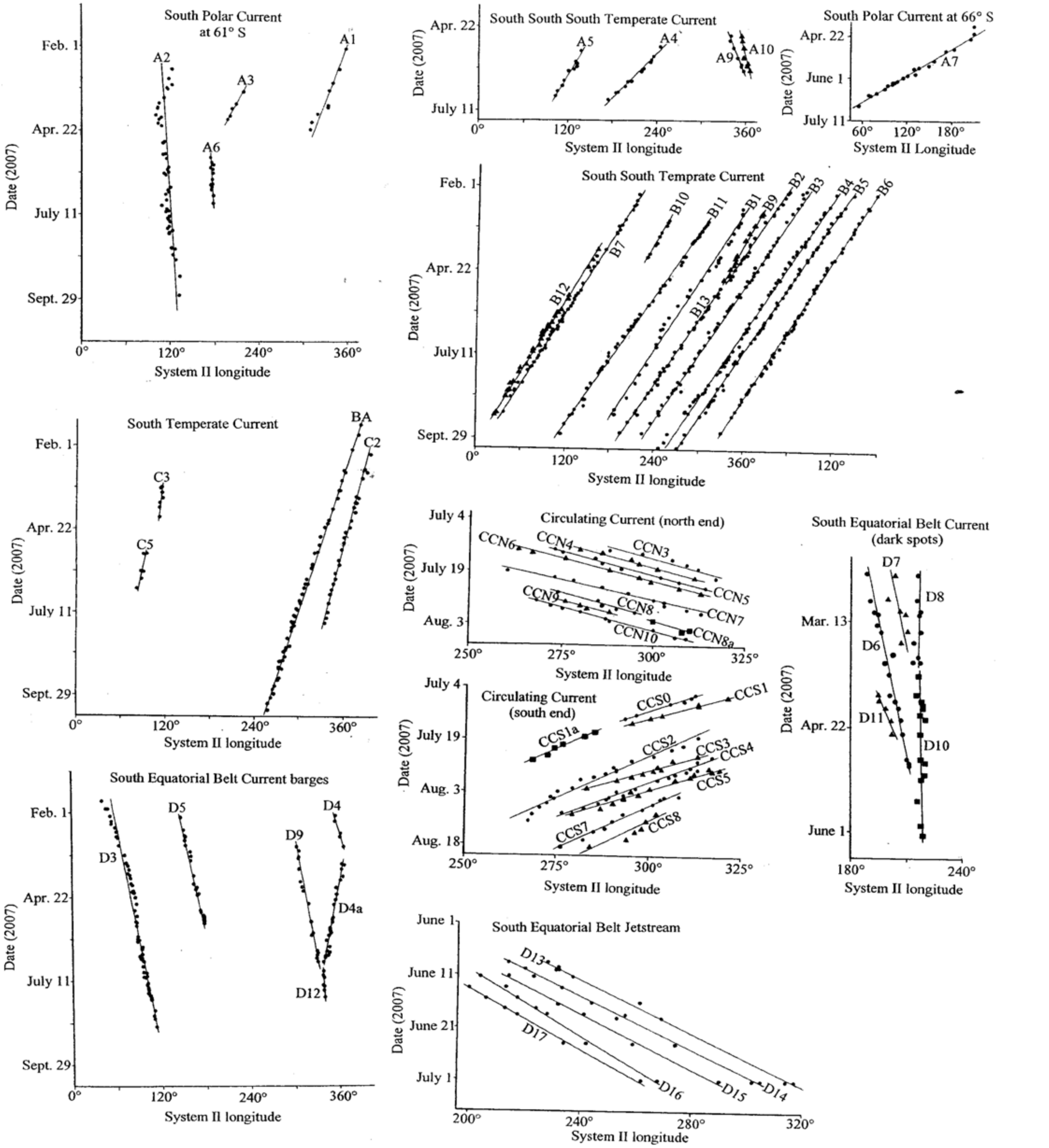


Figure 4: Drift rates for various features in Jupiter's southern hemisphere during the 2006-07 apparition.

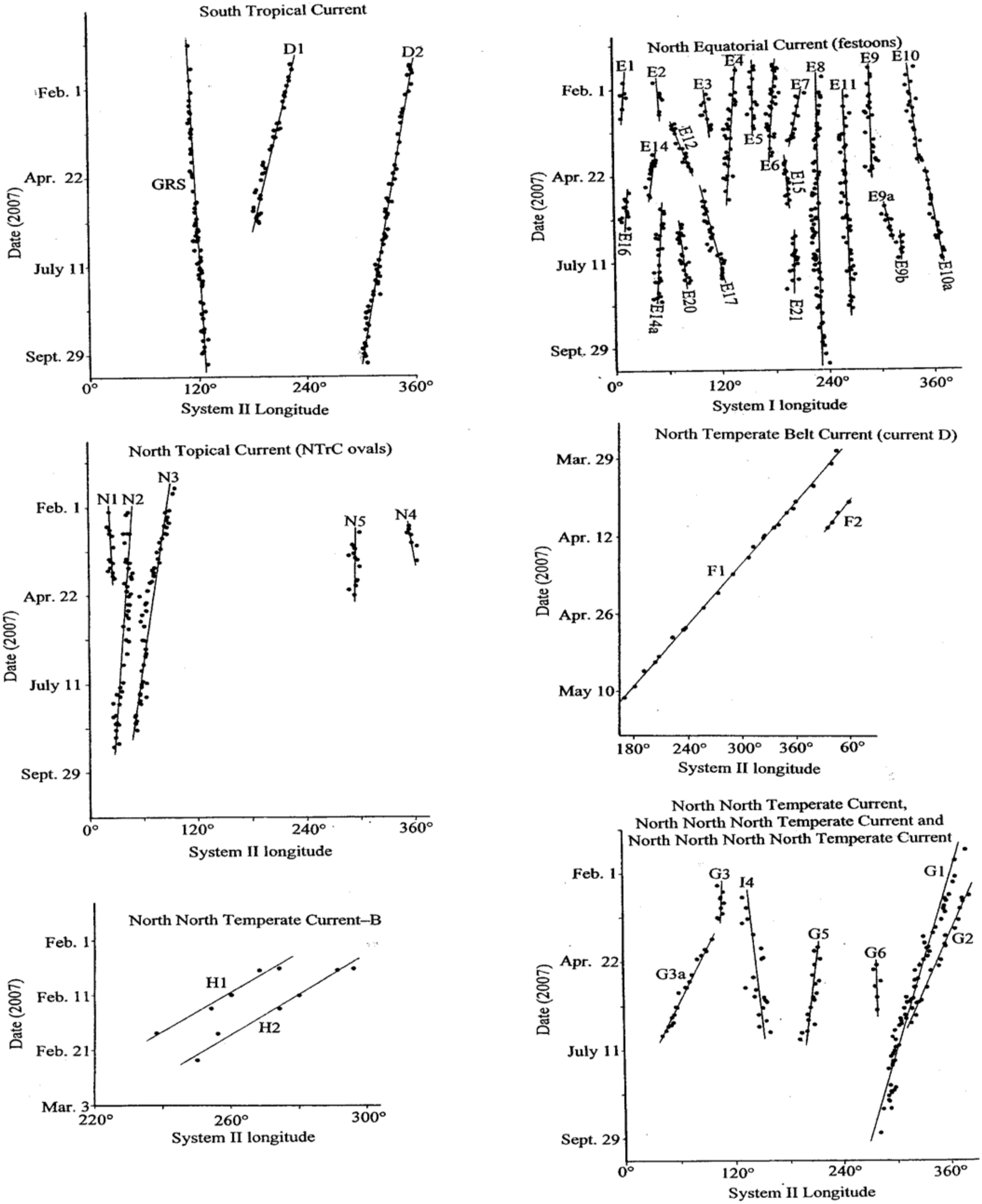
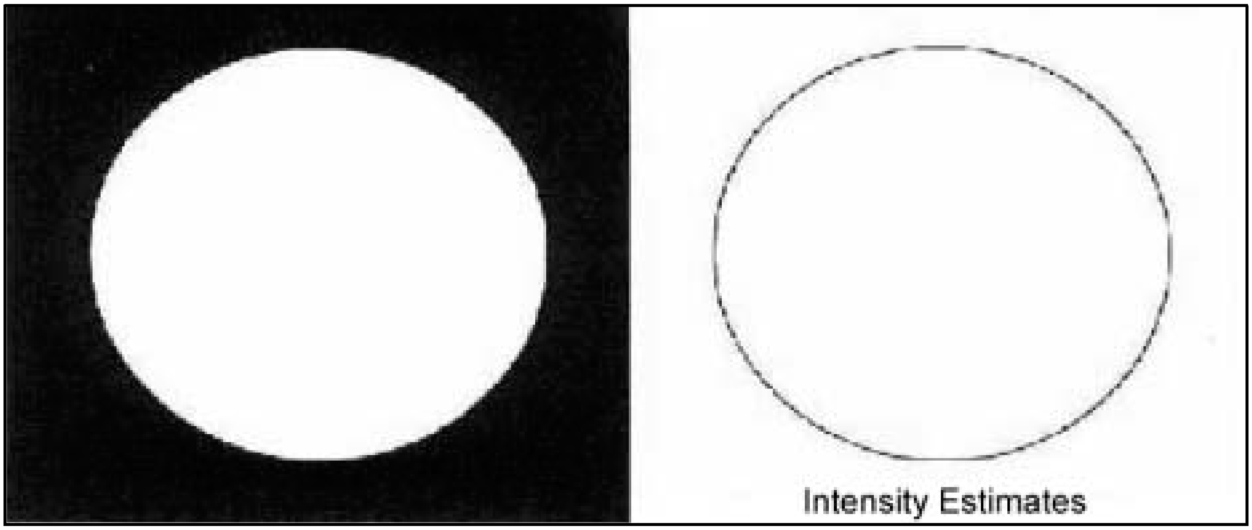


Figure 5: Drift rates for various features on Jupiter.

ALPO Jupiter Section Observation Form No. _____



Date (UT): ____________________________________

Time (UT): ____________________________________

CM I _____ CM II ____ CM III _______

Begin (UT): _____________ End (UT) ____________

Telescope: f/ ___ Size: __________ (in./cm.; RL/RR/SC)

Magnification: _______x ________x ________x

Filters: ________________________________(W / S)

Trnasparency (1 - 5): ____ (Clear / Hazy / Int. Clouds)

Seeing (1 - 10): _________ Antoniadi (I - V): _________

Name: ____________________________________

Address: ____________________________________

____

City, State, ZIP: ____________________________

____

Observing Site: ____________________________

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E-mail: ____________________________________

No.	Time (UT)	S I (°)	S II (°)	S III (°)	Remarks

Notes

ALPO Jupiter Sectional Sketch

Time (UT): ____________________

S I (°): ____________________

S II (°): ____________________

S III (°): ____________________

Date (UT): ____________________

Time (UT): ____________________

CM I _____ CM II ____ CM III _______

Date (UT): ____________________

Begin (UT): ____________ End (UT) __________

Telescope: f/ ____ Size: ______ (in./cm.; RL/RR/SC)

Magnification: _______ x ________ x ________x

Filters: ____________________(W / S)

Seeing (1 - 10): ________ Antoniadi (I - V): _______

Tranparency (1 - 6) _____ (Clear / Haze / Int. Clouds)

Name: ____________________

Address: ____________________

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City, State, ZIP: ____________________

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Observing Site: ____________________

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E-mail: ____________________

No.	Time (UT)	S I (°)	S II (°)	S III (°)	Remarks

Notes

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ALPO Galilean Satellite Eclipse Visual Timing Report Form

Describe your time source(s) and estimated accuracy	Observer Name: Apparition: 20_____-20_____ (conjunction to conjunction)

Event Type (a)	Predicted UT		Observed UT Time (9d)	Telescope Data (e)			Sky Conditions (0-2 scale) (f)			Notes (g)
	Date (b)	Time (c)		Type	Aperture (cm)	Mag.	Seeing	Transparency	Field Brightness	

(a) 1 = Io, 2 = Europa, 3 = Ganymede, 4 = Callisto; D = Disappearance, R = Reappearance
(b) Month and Day
(c) *Predicted* UT to 1 minute
(d) *Observed* UT to 1 second; corrected to watch error if applicable; indicate in "Notes" if Observed UT date differs from Predicted UT date
(e) R = Refractor, N = Newtonian Reflector, C = Cassegrain Reflector, X = Compound/Catadioptric System; indicate in "Notes" if other type.
(f) These conditions, including field brightness (due to moonlight, twilight, etc.), should be described as they apply to the actual field of view, rather than to general sky conditions. Use whole numbers only, as follows:

- 0 = Condition not perceptible; no effect on timing accuracy
- 1 = Condition perceptible; possible minor effect on timing accuracy
- 2 = Condition serious; definite effect on timing accuracy

(g) Include here such factors as wind, drifting cloud(s), satellite near Jupiter's limb, moonlight interference, etc.

At the end of the apparition, return this form to:

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Feature Story: The Remote Planets

ALPO Observations of Uranus and Neptune in 2009-2010

By Richard Schmude, Jr., coordinator, ALPO Remote Planets Section, *Schmude@gdn.edu*

Abstract

Ten people submitted observations of Uranus and Neptune during 2009 and early 2010. The selected normalized magnitudes of Uranus are B(1,0) = -6.65 ± 0.03 and V(1,0) = -7.13 ± 0.03. Several people noted that Uranus had a bright equatorial zone in late 2009, but this feature was not visible in high-resolution images made on September 19, 2009.

Introduction

Three important papers were published in late 2009 and early 2010 that summarize recent developments on Uranus. Sromovsky and coworkers summarize several sets of near-infrared images of Uranus made mostly with the Keck II telescope. A few of their major findings include: 1) the presence of bright polar bands near 45° N and 45° S were present, 2) the south polar band grew dimmer and the north polar band grew brighter between 2004 and 2007, 3) Uranus had clouds that oscillated in both latitude and longitude, and 4) there was an asymmetry in wind speeds between the northern and southern hemispheres between 1997 and 2007. In a second study, Irwin and coworkers (2009) reported that, in near-infrared light, the south polar band grew dimmer between 2007 and 2008. They also reported that the north polar band grew brighter during the same time period. In addition to these studies, this writer summarized observations of the remote planets made in 2008-2009 (Schmude, 2010, 43).

Observations made of Uranus and Neptune in 2009-2010 are summarized in this report. **Table 1** summarizes the orbital characteristics of Uranus and Neptune during their 2009 apparitions. **Table 2** lists the people who contributed observations of Uranus and Neptune during their 2009 apparitions.

Photoelectric Photometry

Brian Loader and this writer made photoelectric brightness measurements of Uranus in 2009. Both individuals used an SSP-3 solid-state photometer along with filters transformed to the Johnson B and V system. More information about the equipment can be found elsewhere (Schmude, 1992, 20), (Optec, 1997), (Schmude, 2008, 156-161). Loader used 96-Aquarii as the comparison star. The brightness values, in magnitudes, used for this star are B = 5.95 and V = 5.55. The writer used λ-Piscium as the comparison star; the assumed brightness, in magnitudes, are B = 4.704 and V = 4.502. Loader used HD 221356 as a check star. His measured brightness values, in magnitudes, are B = 7.04 and V = 6.49; these values compare well with the accepted values of B = 7.023 and V

Table 1: Characteristics of the 2009 Apparitions of Uranus and Neptune[a]

Characteristic	Uranus	Neptune
First Conjunction Date	2009 Mar. 13	2009 Feb. 12
Opposition Date	2009 Sept. 17	2009 Aug. 17
Angular Diameter (Opposition)	3.7 arc-sec.	2.4 arc-sec.
Sub-Earth Latitude (Opposition)	7.2° N	28.7° S
Right Ascension (Opposition)	23 h 42 m	21 h 50 m
Declination (Opposition)	2.9° S	13.6° S
Second Conjunction Date	2010 Mar. 17	2010 Feb. 14

[a]Data are from The Astronomical Almanac for the years 2008 to 2010.

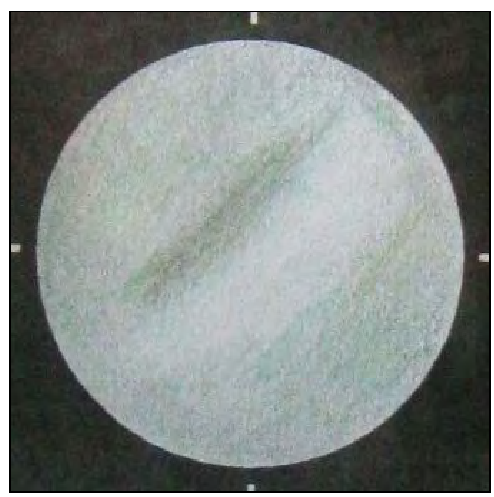

Figure 1. Drawing of Uranus by Ivano Del Prete on November 9, 2009, 03:35 UT with a 0.25 m refractor at 335x to 500x. Seeing = II on the Antoniadi Scale. South at the top, west is to the right.

All Readers

Your comments, questions, etc., about this report are appreciated. Please send them to: *ken.poshedly@alpo-astronomy.org* for publication in the next Journal.

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Left-click your mouse on:

•The e-mail address in blue text to contact the author of this article.

•The references in blue text to jump to source material or information about that source material (Internet connection must be ON).

= 6.496 (Westfall, 2008), (Mermilliod, J. –C., 1991).

Brightness measurements for Uranus are summarized in **Table 3**. All values in this table are corrected for atmospheric extinction and color transformation. Transformation corrections were carried out using the two-star method described in Hall and Genet (1988, 199). When computing transformation corrections, this writer used a color index of B-V = 0.53 for Uranus; this is the seasonal average value for that planet (Schmude, 2008, 17). Since this writer used a small telescope (0.09 meters), his measurements are given a lower weight than those reported by Loader. The selected normalized magnitudes for Uranus in 2009 are B(1,0) = -6.65 ± 0.03 and V(1,0) = -7.13 ± 0.03. These values are close to those measured in the previous apparition (Schmude, 2010, 43).

Table 2: Contributors to the ALPO Remote Planets Section in 2009-2010

Name (Location)[a]	Type of Observation[b]	Instrumentation[c]
Patrick Abbott (Canada)	VP	10x50 B
David Arditti (UK)	I	0.13 m SC
Brian Cudnik (USA)	DN	0.36 m SC
Ivano Del Prete (USA)	D	0.25 m RR
Brian Loader (New Zealand)	PP	0.25 m SC
Keith Murdock (USA)	DN	1.52 m RL
Detlev Niechoy (Germany)	D	0.20 m SC
Carl Roussell (Canada)	D, DN, VP	0.15 m RR
Richard Schmude, Jr. (USA)	PP, VP	0.09 m M, 10x70 B
Wayne Watson (USA)	DN	—

[a] The following people also sent images to http://alpo-j.asahikawa-med.ac.jp/index.htm C. Gargiulo, T. Ikemura, W. Kivits, S. Maksymowicz, D. Peach, C. Roussell, J. Sussenbach and T. Yokokura. The following people also sent images to http://www.arksky.org: M. Delcroix and W. Kivits.

[b] D = drawing, DN = descriptive notes, I = image, PP = photoelectric brightness measurements, VP = visual brightness measurements.

[c] B = binoculars, M = Maksutov, RL = reflector, RR = refractor, SC = Schmidt-Cassegrain

Visual Photometry

Abbott, Roussell and this writer made a total of 61 visual brightness estimates of Uranus and 48 visual brightness estimates of Neptune during 2009 and early 2010. The average normalized magnitude,

Figure 2. Four images of Uranus by Damian Peach on September 19, 2010. The image on the left (04:00 UTC) and is a combined image made with the luminence, red, green and blue filters. The next image (03:38 UTC) was made with a filter that transmitted light with wavelengths of between 600 and 1000 nm. The third image (04:00 UTC) was made with a green filter. The fourth image (04:14 UT) was made with a blue filter. In all cases, south is up and the following edge is to the right. Imaging and other equipment data not available.

Table 3: Brightness Measurements of Uranus Made in 2009

Date (2009)	Filter	Brightness (magnitudes)	X(1,0) (magnitudes)	Weight	Comparison Star
Oct. 11	B	6.26	-6.66	4	96-Aquarii
Oct. 11	V	5.81	-7.12	4	96-Aquarii
Oct. 20	V	5.79	-7.15	1	λ-Piscium
Oct. 21	V	5.72	-7.22	1	λ-Piscium
Nov. 16	B	6.33	-6.64	4	96-Aquarii
Nov. 16	V	5.86	-7.11	4	96-Aquarii

$V_{vis}(1,0)$ for Uranus and Neptune are -7.1 and -7.0, respectively for 2009-2010.

Drawings and Images

Del Prete made a drawing of Uranus with a 0.25 meter refractor (see **Figure 1**). A bright equatorial zone is visible. Del Prete notes that it was especially bright in the green (W58) filter. Yokokura, Roussell and Maksymowicz also drew a bright equatorial zone; however, this feature is not visible in Damian Peach's September 19, 2009 images (see **Figure 2**).

Carmine Gargiulo posted an infrared light image of Uranus on the ALPO Japan latest website (*http://alpo-j.asahikawa-med.ac.jp/index.htm*). This image shows a bright equatorial zone with a bright spot at the limb. A 0.20-meter Schmidt-Cassegrain telescope was used in making the image.

Figure 3 shows both a shaded and an intensity drawing of Uranus. Note the bright equatorial zone."

Acknowledgements

The writer would like to express his appreciation to everyone who submitted observations of Uranus and Neptune during 2009 and 2010. He is also grateful to Sue Gilpin and Truman Boyle for their assistance.

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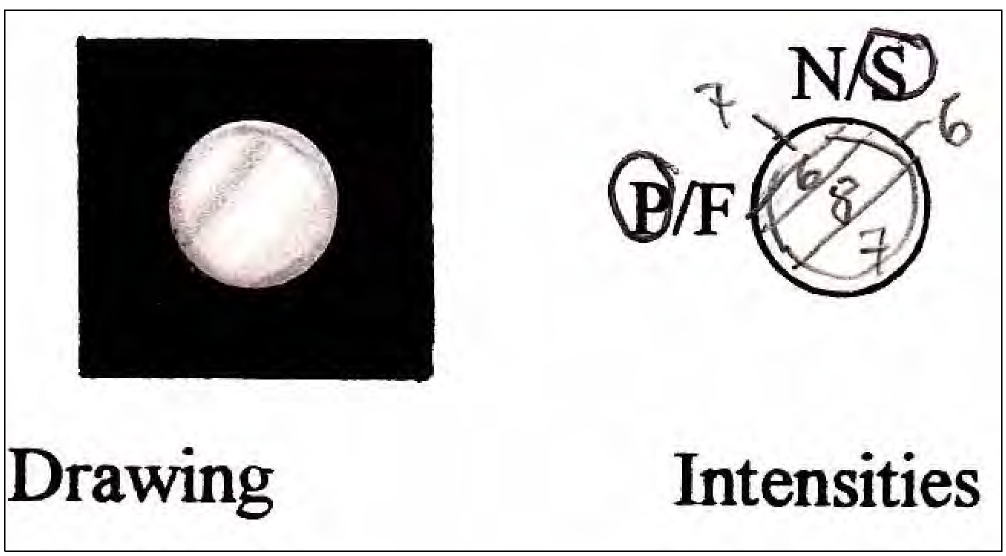


Figure 3. Two drawings of Uranus by Carl Roussell on September 24, 2009 (05:15 - 05:45 UT). Drawing at left portrays planet as visually seen; drawing at right indicates brightness intensities (preceding limb at left, south at top). Equipment included a 0.15 m refractor at 400x; Seeing = 7. The intensities are on the ALPO scale with 0 = black and 10 = white.

ALPO Remote Planets Section Report Form

General Information

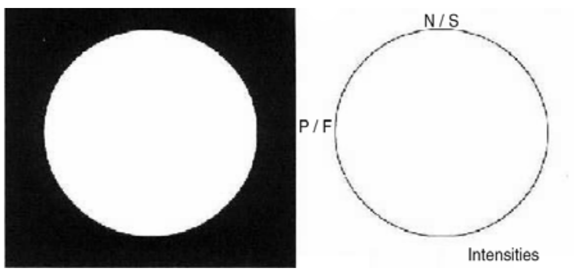
Name: ________________________________ Location: ____________________

Date (UT): ________________ Start: ____________(UT) Finish ____________ (UT)

Telescope: Type: ___________ Aperture: ___________ Magnification: ____________

Seeing: _________ Transparency:_____________ Your Latitude: ______________

A. Visual Observations



Planet: ________________________

Circle N (North) or S (South)
P (Preceding) or F (Following)

Comments: ____________________
____
____
____

C. Color Estimate

Planet: ________________________

Color description: ________________
____
____

B. Photography / CCD Imaging

Method (circle your choice):
Prime Focus / Eyepiece Projection / CCD / Film

Exposure time: ___________________

f / ratio: ________________________

Developer: _______________________

Comments: _______________________
____

D. Occultations / Near Misses

Planet: __________________________

Star occulted: _____________________

Planet: RA ___________ Dec __________

Star: RA ___________ Dec __________

Comments: _______________________
____
____

E-1 Photoelectric Photometry (use separate sheet for reduction calculations)

Time (UT)	Star/Planet	Filter U B V R I	Scale	Integration Time	Count	Sky Brightness

E-2 Visual Photometry

Comparison Star 1 (HD or SAO#) __________ Mag. _________ Source____________
Comparison Star 1 (HD or SAO#) __________ Mag. _________ Source____________
Planet ________________ Estimated Mag. _________ (Note: “Mag.” = Magnitude)

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Online Readers

Items in blue text in the *ALPO Staff E-mail Directory* above are links to e-mail addresses. Left-click your mouse on the names in blue text to open your own e-mail program with a blank e-mail preaddressed to the person you chose. NOTE: Your Internet connection MUST be ON for this feature to work.

ALPO Resources

People, publications, etc., to help our members

megabytes.

- **Monograph No. 11**. *The Charte des Gebirge des Mondes* (Chart of the Mountains of the Moon) by J. F. Julius Schmidt, this monograph edited by John Westfall. Nine files including an accompanying guidebook in German. Note files sizes: Schmidt0001.pdf, approx. 20.1 mb; Schmidt0204.pdf, approx. 32.6 mb; Schmidt0507.pdf, approx. 32.1 mb; Schmidt0810.pdf, approx. 31.1 mb; Schmidt1113.pdf, approx. 22.7 mb; Schmidt1416.pdf, approx. 28.2 mb; Schmidt1719.pdf, approx. 22.2 mb; Schmidt2022.pdf, approx. 21.1 mb; Schmidt2325.pdf, approx. 22.9 mb; SchmidtGuide.pdf, approx. 10.2 mb

ALPO Observing Section Publications

Order the following directly from the appropriate ALPO section coordinators; use the address in the listings pages which appeared earlier in this booklet unless another address is given.

- **Solar:** Totally revised *Guidelines for the Observation and Reporting of Solar Phenomena*, $10 USD; includes CD with 100 page-manual in pdf with up-to-date techniques, images, and links to many solar references. Produced by ALPO Solar Section Assistant Coordinator and Archivist Jamey Jenkins, this publication replaces *Observe and Understand the Sun* and its predecessor, *The Association of Lunar& Planetary Observer's Solar Section Handbook for the White Light Observation of Solar Phenomena*, both by the ALPO's own Rik Hill. To order, send check or US money order made payable to Jamey Jenkins, 308 West First Street, Homer, Illinois 61849; e-mail to *jenkinsjl@yahoo.com*

- **Lunar & Planetary Training Section:** *The Novice Observers Handbook* $15. An introductory text to the training program. Includes directions for recording lunar and planetary observations, useful exercises for determining observational parameters, and observing forms. Available as pdf file via e-mail or send check or money order payable to Timothy J. Robertson, 195 Tierra Rejada Rd., #148, Simi Valley, CA 93065; e-mail *cometman@cometman.net*.

- **Lunar (Bailey):** (1) *The ALPO Lunar Selected Areas Program (*$17.50). Includes full set of observing forms for the assigned or chosen lunar area or feature, along with a copy of the *Lunar Selected Areas Program Manual.* (2) *observing forms,* free at *http://moon.scopesandscapes.com/alpo-sap.html*, or $10 for a packet of forms by regular mail. Specify *Lunar Form*s. NOTE: Observers who wish to make copies of the observing forms may instead send a SASE for a copy of forms available for each program. Authorization to duplicate forms is given only for the purpose of recording and submitting observations to the ALPO lunar SAP section. Observers should make copies using high-quality paper.

- **Lunar**: *The Lunar Observer*, official newsletter of the ALPO Lunar Section, published monthly. Free at *http://moon.scopesandscapes.com/tlo.pdf* or $1.25 per hard copy: send SASE with payment (check or money order) to: Wayne Bailey, 17 Autumn Lane, Sewell, NJ 08080.

- **Lunar (Jamieson):** *Lunar Observer's Tool Kit*, price $50, is a computer program designed to aid lunar observers at all levels to plan, make, and record their observations. This popular program was first written in 1985 for the Commodore 64 and ported to DOS around 1990. Those familiar with the old DOS version will find most of the same tools in this new Windows version, plus many new ones. A complete list of these tools includes Dome Table View and Maintenance, Dome Observation Scheduling, Archiving Your Dome Observations, Lunar Feature Table View and Maintenance, Schedule General Lunar Observations, Lunar Heights and Depths, Solar Altitude and Azimuth, Lunar Ephemeris, Lunar Longitude and Latitude to Xi and Eta, Lunar Xi and Eta to Longitude and Latitude, Lunar Atlas Referencing, JALPO and Selenology Bibliography, Minimum System Requirements, Lunar and Planetary Links, and Lunar Observer's ToolKit Help and Library. Some of the program's options include predicting when a lunar feature will be illuminated in a certain way, what features from a collection of features will be under a given range of illumination, physical ephemeris information, mountain height computation, coordinate conversion, and browsing of the software's included database of over 6,000 lunar features. Contact *harry@persoftware.com*

- **Venus (Benton):** Introductory information for observing Venus, including observing forms, can be downloaded for free as pdf files at *http://www.alpo-astronomy.org/venus*. The *ALPO Venus Handbook* with observing forms included is available as the *ALPO Venus Kit* for $17.50 U.S., and may be obtained by sending a check or money order made payable to "Julius L. Benton" for delivery in approximately 7 to 10 days for U.S. mailings. The *ALPO Venus Handbook* may also be obtained for $10 as a pdf file by contacting the ALPO Venus Section. All foreign orders should include $5 additional for postage and handling; p/h is included in price for domestic orders. NOTE: Observers who wish to make copies of the observing forms may instead send a SASE for a copy of forms available for each program. Authorization to duplicate forms is given only for the purpose of recording and submitting observations to the ALPO Venus section. Observers should make copies using high-quality paper.

- **Mars:** *(1) ALPO Mars Observers Handbook,* send check or money order for $15 per book (postage and handling included) to Astronomical League Sales, 9201 Ward Parkway, Suite 100, Kansas City, MO 64114; phone 816-DEEP-SKY (816-333-7759); e-mail *leaguesales@astroleague.org*. *(2) Observing Forms;* send SASE to obtain one form for you to copy; otherwise send $3.60 to obtain 25 copies (send and make checks payable to "Deborah Hines", see address under "Mars Section").

- **Jupiter:** *(1) Jupiter Observer's Handbook*, $15 from the Astronomical League Sales, 9201 Ward Parkway, Suite 100, Kansas City, MO 64114; phone 816-DEEP-SKY (816-333-7759);

ALPO Resources

People, publications, etc., to help our members

e-mail *leaguesales@astroleague.org*. (2) *Jupiter*, the ALPO section newsletter, available online only via the ALPO website at *http://mysite.verizon.net/macdouc/alpo/jovenews.htm;* (3) *J-Net*, the ALPO Jupiter Section e-mail network; send an e-mail message to Craig MacDougal. (4) *Timing the Eclipses of Jupiter's Galilean Satellites* free at *http://www.alpo-astronomy.org/jupiter/GaliInstr.pdf*, report form online at *http://www.alpo-astronomy.org/jupiter/GaliForm.pdf*; send SASE to John Westfall for observing kit and report form via regular mail. (5) *Jupiter Observer's Startup Kit*, $3 from Richard Schmude, Jupiter Section coordinator.

- **Saturn (Benton):** Introductory information for observing Saturn, including observing forms and ephemerides, can be downloaded for free as pdf files at *http://www.alpo-astronomy.org/saturn*; or if printed material is preferred, the *ALPO Saturn Kit* (introductory brochure and a set of observing forms) is available for $10 U.S. by sending a check or money order made payable to "Julius L. Benton" for delivery in approximately 7 to 10 days for U.S. mailings. The former *ALPO Saturn Handbook* was replaced in 2006 by *Saturn and How to Observe It* (by J. Benton), and it can be obtained from book sellers such as *Amazon.com*. NOTE: Observers who wish to make copies of the observing forms may instead send a SASE for a copy of forms available for each program. Authorization to duplicate forms is given only for the purpose of recording and submitting observations to the ALPO Saturn Section.

- **Meteors:** (1) *The ALPO Guide to Watching Meteors* (pamphlet). $4 per copy (includes postage & handling); send check or money order to Astronomical League Sales, 9201 Ward Parkway, Suite 100, Kansas City, MO 64114; phone 816-DEEP-SKY (816-333-7759); e-mail *leaguesales@astroleague.org*. (2) *The ALPO Meteors Section Newsletter*, free (except postage), published quarterly (March, June, September, and December). Send check or money order for first class postage to cover desired number of issues to Robert D. Lunsford, 1828 Cobblecreek St., Chula Vista, CA 91913-3917.

- **Minor Planets (Derald D. Nye):** *The Minor Planet Bulletin*. Published quarterly; free at *http://www.minorplanetobserver.com/mpb/default.htm*. Paper copies available only to libraries and special institutions at $24 per year via regular mail in the U.S., Mexico and Canada, and $34 per year elsewhere (airmail only). Send check or money order payable to "Minor Planet Bulletin", c/o Derald D. Nye, 10385 East Observatory Dr., Corona de Tucson, AZ 8564l-2309.

Other ALPO Publications

Checks must be in U.S. funds, payable to an American bank with bank routing number.

- ***An Introductory Bibliography for Solar System Observers.*** **No charge.** Four-page list of books and magazines about Solar System objects and how to observe them. The current edition was updated in October 1998. Send self-addressed stamped envelope with request to current ALPO Membership Secretary (Matt Will).

- ***ALPO Membership Directory.*** Provided only to ALPO board and staff members. Contact current ALPO membership secretary/treasurer (Matt Will).

Back Issues of The Strolling Astronomer

- Download JALPO43-1 thru present issue in pdf from the ALPO website at *http://www.alpo-astronomy.org/djalpo* (no charge; most recent issues are password-protected, contact ALPO membership secretary Matt Will for password info).

  Many of the hard copy back issues listed below are almost out of stock, and it is impossible to guarantee that they will remain available. Issues will be sold on a first-come, first-served basis. Back issues are $4 each, and $5 for the current issue. We can arrange discounts on orders of more than $30. Order directly from and make payment to "Walter H. Haas" (see address under "Board of Directors,"):

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THE ASSOCIATION OF LUNAR & PLANETARY OBSERVERS (ALPO)

The Association of Lunar & Planetary Observers (ALPO) was founded by Walter H. Haas in 1947, and incorporated in 1990, as a medium for advancing and conducting astronomical work by both professional and amateur astronomers who share an interest in Solar System observations. We welcome and provide services for all individuals interested in lunar and planetary astronomy. For the novice observer, the ALPO is a place to learn and to enhance observational techniques. For the advanced amateur astronomer, it is a place where one's work will count and be used for future research purposes. For the professional astronomer, it is a resource where group studies or systematic observing patrols add to the advancement of astronomy.

Our Association is an international group of students that study the Sun, Moon, planets, asteroids, meteors, meteorites and comets. Our goals are to stimulate, coordinate, and generally promote the study of these bodies using methods and instruments that are available within the communities of both amateur and professional astronomers. We hold a conference each summer, usually in conjunction with other astronomical groups.

We have “sections” for the observation of all the types of bodies found in our Solar System. Section coordinators collect and study submitted observations, correspond with observers, encourage beginners, and contribute reports to our quarterly Journal at appropriate intervals. Each section coordinator can supply observing forms and other instructional material to assist in your telescopic work. You are encouraged to correspond with the coordinators in whose projects you are interested. Coordinators can be contacted either via e-mail (available on our website) or at their postal mail addresses listed in our Journal. Members and all interested persons are encouraged to visit our website at *http://www.alpo-astronomy.org*. Our activities are on a volunteer basis, and each member can do as much or as little as he or she wishes. Of course, the ALPO gains in stature and in importance in proportion to how much and also how well each member contributes through his or her participation.

Our work is coordinated by means of our periodical, *The Strolling Astronomer*, also called the *Journal of the Assn. of Lunar & Planetary Observers*, which is published seasonally. Membership dues include a subscription to our Journal. Two versions of our ALPO are distributed — a hardcopy (paper) version and an online (digital) version in “portable document format” (pdf) at considerably reduced cost.

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