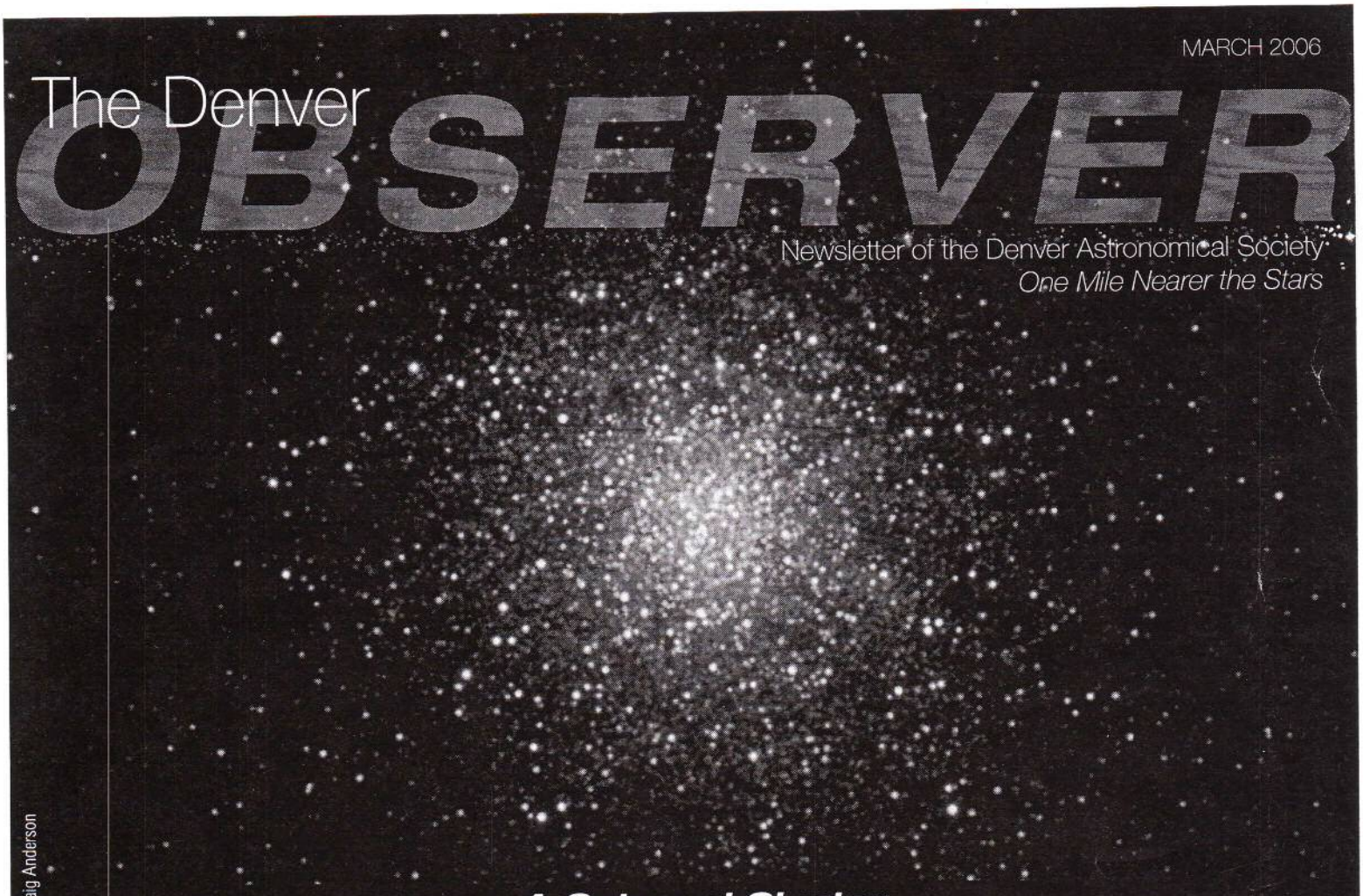
MARCH 2006

The Denver OBSERVER

Newsletter of the Denver Astronomical Society

One Mile Nearer the Stars



A Colossal Cluster

A spectacular rest stop on the Messier Marathon roadmap (See Page 3) is M13 (NGC 6205) in Hercules. Visible naked-eye as a faint fuzzy smudge, this globular cluster lies about 25,000 light-years away and is the brightest of its type that we can see in the northern hemisphere. It contains more than 100,000 stars. For this image Craig used an SBIG ST-2000XM CCD camera on an AP 155 f/7 telescope with a G11 mount. Visit his website at *http://www.alexthedog.com* for more details.

MARATHON MADNESS

Inside The *Observer*

MARCH SKIES

PARADE OF GALAXIES

The magnificent lanterns of winter are giving way to the more subdued lights of approaching spring. Ahh, but don't be fooled by appearances. Tucked among the paler stars are some of the most magnificent galaxies to be found anywhere in the northern hemisphere and are worth every

Continued on page 6

6 ..... First quarter moon
14 ..... Full moon,
..... Penumbral lunar eclipse
22 ..... Last quarter moon
20 ..... Vernal Equinox
29 ..... New moon,
..... Total Solar Eclipse

MARCH PREDOMINANT MESSIER OBJECTS

#	Description	RA	DEC
3	Globular cluster	13h 42m31s	+28° 20'52"
44	Open cluster	08h 40m28s	+19° 57'45"
46-47	Open clusters-centroid	07h 39m27s	-14° 40'18"
48	Open cluster	08h 14m07s	-05° 49'10"
51	The Whirlpool galaxy	13h 30m12s	+47° 09'50"
63	The Sunflower galaxy	13h 16m07s	+41° 59'48"
81-82	Spiral galaxies -centroid	09h 55m13s	+69° 23'15"
95	Spiral galaxy	10h 44m19s	+11° 40'14"
96	Spiral galaxy	10h 47m06s	+11° 47'14"
~	Virgo Cluster-centroid	12h 27m58s	+13° 21'50"
97	The Owl Nebula	11h 15m12s	+54° 58'57"
101	Spiral galaxy	14h 03m28s	+54° 18'55"
109	Spiral galaxy	11h 57m58s	+53° 20'50"

President's Corner

The Changing of the Guard . . .
The Passing of the Baton . . .

A #7, mild, with chips and no guacamole . . . No—wait . . . strike that last bit. Sorry . . . last night's dinner.

The powers that be have spoken and a new Executive Board will be empowered at the Annual Banquet on March 18 (see Page 6 for some details.) I'd like to thank all those who allowed their names to be tossed into the proverbial ring and those who will now head the Society.

As this is my final installment of the President's Corner, I, very heartily, tip my hat, with great appreciation, to some folk who've given far beyond any volunteer expectations.

Ms. Sandy Shaw, who has diligently pursued proper courses to keep our tax-exempt status in fair running order—a daunting, exhaustive task, at best. You have my deepest thanks and greatest respect, Sandy.

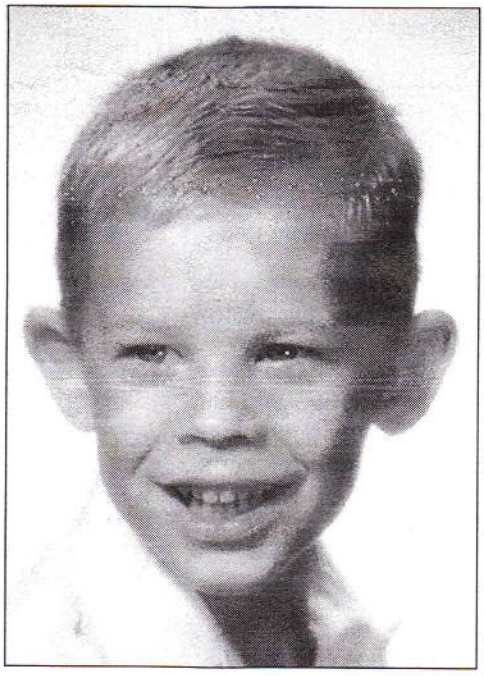
Mr. Frank Mancini, a gentleman with executive flair and the talent to chart an ambitious financial path for the Society, a very great necessity for its overall and future health. To you, sir.

Ms. Patti Kurtz, Mr. Pat Ryan, and Mrs. Christine Green, tireless scriptors of the events and stories of the Society, and producers of the finest club tribune in existence; to all of you, an endless debt.

Mr. Wayne Green—ambitious and never energy-deficient, who has helped bring the Society the necessaries of technology and 21st-century-edness. My friend, I don't know when you sleep, if, indeed, you do at all, but it must be filled, not with numbered sheep, but new ideas, always new ideas.

Director Dr. Bob, Jack, Joe, Ivan, Dan, David, Aaron, idea and travel companion, Wayne Kaaz, Carla, Darrell, Stuart, Ted, Todd,

Continued on page 3



Steve Solon looks years younger since he stepped down as president of the Denver Astronomical Society.

DAS Schedule

MARCH

4 Open House at Chamberlin Observatory (5:00 P.M.-9:00 P.M.)
10 E-Board meeting, 8 P.M.
17 St. Patrick's Day
18 DAS Annual Spring Banquet (6:00-9:00 P.M., takes the place of the General Meeting, See Page 6.)
25-26 EGK Dark Site Weekend (Messier Marathon)

APRIL

2 Daylight Savings Time Begins
8 Open House at Chamberlin Observatory (Begins at 7:30 P.M.)
12 Passover begins at Sundown
14 E-Board meeting, (8 P.M.)
Good Friday
16 Easter Sunday
21 General Meeting (7:30 P.M.)
22 Earth Day
23-30 Texas Star Party
29-30 EGK Dark Site Weekend

Public nights are held every Tuesday and Thursday evenings beginning at the following times: October 1 - March 31 at 7:00 P.M.
April 1 - September 30 at 8:30 P.M. at Chamberlin Observatory
Costs to non-members are: $3.00 adults, $2.00 children.
Please call (303) 871-5172 for reservations.

DAS Officers

President:
Wayne Green (303) 530-1023
Email: wgreen@infosavvy.org

Vice President:
Darrell Dodge (303) 932-1309
Email: dmdodge@aol.com

Secretary:
Stuart Hutchins (303) 670-1299
Email: stuart-atm@earthlink.net

Treasurer:
Brad Gilman (720) 488-1028
Email: Brad.Gilman@echostar.com

ALCor:
Jerry Sherlin (303) 680-6894
Email: sherlinj@msn.com

IDA Representative:
Dr. Robert Stencel

Executive Board Members

Jack Eastman — Bill Ormbsy
Joe Gafford — Ron Pearson
Frank Mancini — David Shouldice
Ron Mickle — Dan Wray
Steve Solon, Past President
President Emeritus, Larry Brooks

DAS Information Line:
(303) 871-5172

DAS Correspondence:
Denver Astronomical Society
Chamberlin Observatory C/O Steve Solon
2930 East Warren Avenue
Denver, Colorado 80210

Van Nattan Scholarship Fund
P.O. Box 150743
Lakewood, Colorado 80215-0743

Webmistress:
Patti Kurtz
Email: *p_kurtz@comcast.net*

Newsletter:
Denver Observer editor, Patti Kurtz
StarFire Creations Unlimited
(720) 217-5707
The Observer *is available in color PDF format from the DAS website.*

The Executive Board conducts the business of the DAS at 8 P.M. at Chamberlin Observatory. Please see the Schedule of Events for meeting dates. All members are welcome.

thedas.org

President's Corner

Continued from page 2

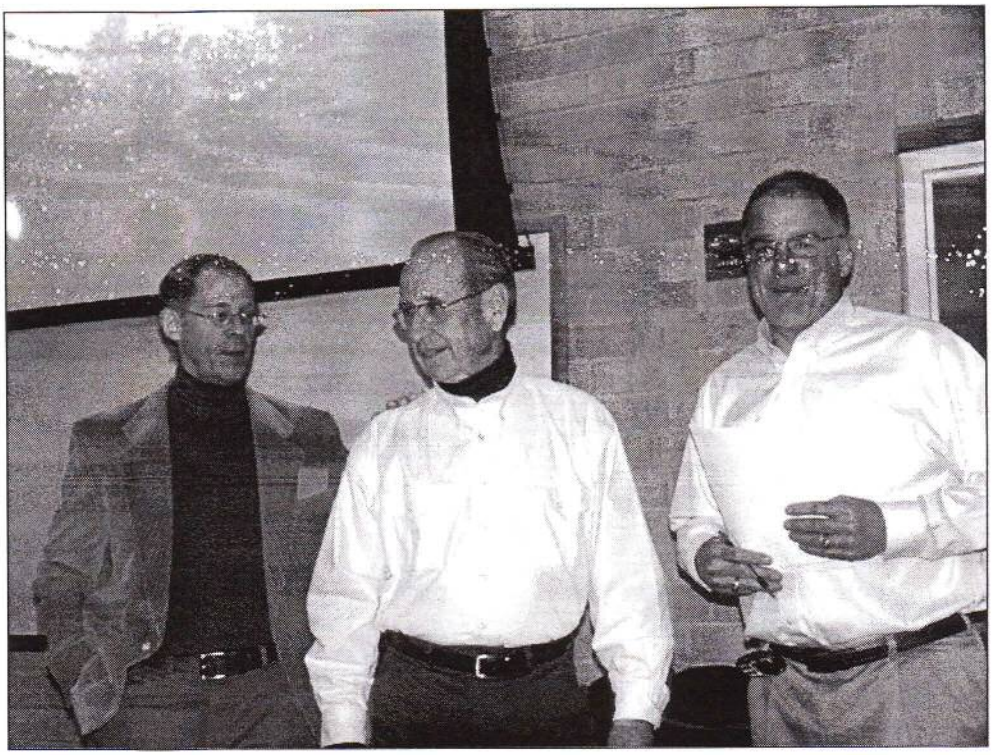
Ron, Chuck, Larry, Cathie Havens, departed friend, Ed Kline and all who lend their personages to the Board, Public Nights, Open Houses, Star Parties and Dark-Site work—you give vitality and warmth to this intrepid band of sky watchers, and I am forever grateful.

And finally, to my great friend and adopted father, Bill Ormsby, the quietest, but greatest, presence. And, as with all genuine greatness, no ego or consideration of self—just help, help and more help, coupled with respect for people and their love of space, the principle upon which we are based. I wish you health and peace, Uncle Bill.

I have enjoyed, immensely, the task of heading this Society, with all its joys, tensions, smiles and disagreements. These are a normal part of any undertaking, but have been made especially memorable by the personalities with whom they've happened; all wonderful.

I would ask that everyone continue to do all they can to make the DAS and its home, Historic Chamberlin Observatory, the greatest of endeavors. Your work is, and will continue to be, a reflection of great people of whom I am very proud.

All the best—*Steve Solon*



Financial Development Committee member Cliff Simpson announced a $5,000.00 gift to the DAS at the General meeting Friday, February 10th. John Larson of Larson Distributing is donating $5,000.00 to help fund DAS activities such as public outreach and Chamberlin Observatory program delivery. Cliff has been on the committee less than a month, and has already obtained this much needed financial assistance for DAS. Image courtesy Bill Ormsby

Messier Marathon Madness

by Darrell Dodge

The Society's 2006 Edition of Messier Marathon Madness will take place at the Edmund G. Kline Dark Site the weekend of March 25th and 26th. March is the month when it is possible to see all of the Messier Objects in one night. This task is made more challenging by a number of tradeoffs, involving the Sun, the Moon, and the position of the first and last objects in the Marathon: the face-on galaxy M74 in Pisces, the most difficult of all 110 Messier objects, which is typically glowing weakly in fading sunlight and the artificial glow of the Denver nebula and M30, a globular cluster in Capricorn.

Anyone who has tried to complete a marathon at our latitude has experienced the early evening and early morning challenge that brackets a truly wonderful observing opportunity. This year, the rising of the old crescent moon quite close to M30 on both mornings promises to create a tough observing test. But there will probably be a good number of people up to trying it.

Marathon checklist forms will be available and, as usual, some "old hands" in the club will be available to provide advice on observing order, navigating the Virgo Galaxy Cluster at 1 A.M., and the best times to rest or eat.

The marathon is usually not a good time to complete an Astronomical League Messier Certificate unless you need just a few more objects. The AL certificate requires a relatively detailed narrative description, which can be daunting during the more frenetic times of the night. There are several other organizations that offer Marathon awards for various levels of achievement.

Remember, "go-to" computers or encoders cannot be used for either an AL Messier certificate or a Marathon award. What can be guaranteed is that this night of star hopping will be an experience you will never forget.

Note from the editor:

Congratulations to the new officers and board members. May your service to the DAS be a wonderful experience. My ever-always gratitude to Steve Solon for his leadership and love for this organization. Steve, your shoes will be hard to fill but I know that Wayne will also make us proud.

As always I'm grateful to our generous contributors: Craig Anderson, Darrell Dodge, Joe Gafford, Ron Pearson, Sandy Shaw and Steve Solon. And, thanks again to the Public Night Team 3: Norm Rosling, Bill Ormsby, David Shouldice, Stuart Hutchins and Steve Solon for writing "March Skies."

Newsletter contributions (ccd and film astrophotos, star party candids, short observing anecdotes, feature articles, observing and imaging tips, etc.) are welcome and encouraged. This is your chance to strut your stuff! Please contact me with submission questions.

updates

The Extra-Galactic Discoveries of Dr. Herbert A. Howe, Chamberlin Observatory, Denver, Colorado *Part Two*

by Ron Pearson

Readers who wish to learn more about Dr. Howe's discoveries with the 20-inch Clark at Chamberlin Observatory, should see the biography of Dr. H. A. Howe, by Dr. R. Stencel and H. J. Howe, Denver's Pioneer Astronomer *(2003), which contains a complete bibliography of Dr. Howe's publications and discussions of other important observations and events.—R.P.*

CORRECTION FROM PART ONE (Page 6): The 20-inch Clark was the 3rd largest telescope west of the Mississippi River until 1917.—Ed.

Top Ten Discoverers of Dryer's Two Index Catalogs—
As compiled by Pothier, 1998

Name	Original IC Objects	"Existing" Objects	Ratio
Javelle	1431	1047	73%
Wolf	1127	234	21%
Stewart	672	360	54%
Swift	585	366	63%
Frost	454	250	55%
Bigourdan	322	152	47%
Schwassman	172	63	37%
Barnard	157	75	48%
Howe	64	37 (now 60)	58% (94%)
Spitaler	63	47	75%

This table only lists the "top ten" discoverers, although many more are listed by Pothier. Pothier noted this table was compiled in 1998, before the NGC/IC Project is complete, but "this attempt gives an indication of the observer's diligence." As of December 2005, the NGC/IC project credited Howe with 60 discoveries, increasing his "Existing" object discovery ratio to 94%!

References for Tables:

- *http://www.astrosurf.com/cielextreme/page189E.html,*
- *http://www.astrosurf.com/cielextreme/page03E.html*
- *http://www.klima-luft.de/steinicke/ngcic/persons/howe.htm*
- *http://www.klima-luft.de/steinicke/ngcic/obs_e.htm*
- *http://www.ngcic.org/*

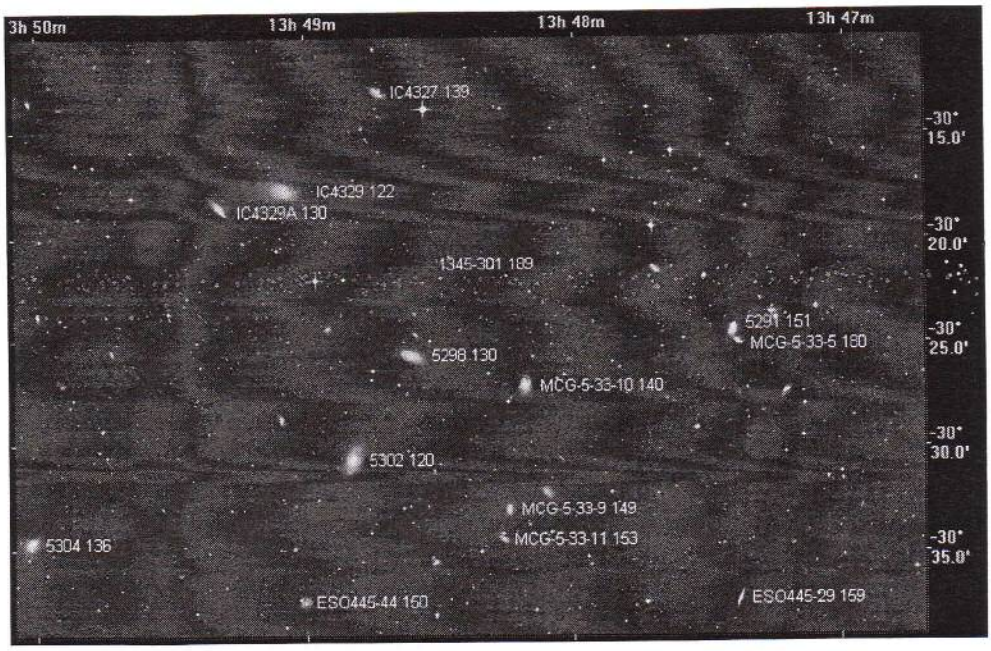
Of historic significance, these galaxies were discovered the old-fashioned way—with hard work. The astronomer, using one of the finest instruments of its day, knew what he was looking for, knew what others had found and therefore could immediately assess at the eyepiece, that out of thousands of other "faint fuzzies" already discovered, what he saw was something not seen or noticed by other observers, and he measured them micrometrically and described them. He also spent perhaps many hundreds of hours following up the discoveries of others, in order to reproduce their results and improve their descriptions or positions. This was discovery science at the end of the 19th century and early 20th.

Perhaps the most significant statement you can make regarding these discoveries is that Dr. Howe was not "cherry-picking." By the end of the 19th century all of the "easy" nebulae had been found and cataloged. The IC II objects were all found photographically according to Dreyer. If you look at the column of visual magnitudes of these objects, they are all very faint—their average magnitude is 14.2. The faintest object is 15.5 and the brightest is 12.9. This is testimony to the darkness of the skies over Denver at the time, the high quality of the telescope and of course the skill of the observer. Many of these objects occur near other already "found" nebula that were poorly located or not clearly described by earlier observers. To find these objects then, separating the known from the unknown and then determining their positions with a micrometer speaks volumes about the tenacity of the observer. If you look at the dates of the discoveries it is intriguing that many are made in January, probably when Dr. Howe was most likely on Christmas break from teaching duties. While the world was out celebrating the turn of the new 20th century on January 1, 1900, Dr. Howe was in a very cold observatory discovering ICs 1741, 1693, and 1745, as he had done on January 1, 1895, discovering and measuring ICs 1592 and 1598.

A ranking of the astronomers whose discoveries contributed to the Index Catalogs has been tabulated by Y. Pothier in France. A portion of his table is copied in the second table in this article. This ranking, based upon the number of discoveries, shows that Chamberlin Observatory is 9th. Dr. Howe is ranked just below E. E. Barnard for the number of objects discovered with a much higher percentage of confirmed objects than most others. Clearly this was an extremely productive time for Chamberlin Observatory.

The publication of the Second Index Catalog (IC II), in 1908 brought to a close137 years of discoveries from mapping the non-stellar objects by dozens of astronomers starting with Charles Messier's first catalog in 1771. I am reminded of the map of North America I saw this past summer at the special exhibit presented at the Denver Museum of Nature & Science's 200th Anniversary of the Lewis and Clark Expedition of 1805. The first map shown at the beginning of the exhibit had the outline of the coast and a few interior details of North America, mostly of the eastern U.S. and southern Canada along the fur trades routes of the Great Lakes. Several years after their journey, Clark published a new edition of the map of North America. Virtually all the significant geographic features such as mountain ranges, rivers and villages had filled in the map using their discoveries and the discoveries of other mountain men, explorers and pioneers.

Dr. Howe, using the 20-inch Clark refractor, and the Bruce Micrometer of Chamberlin Observatory, filled in the last great discoveries of the visual and early photographic observatories that began with Charles Messier in France. Clearly Dr. Howe was "Denver's Pioneer Astronomer" and he could not have done this pioneering work without the "20-inch Clark equatorial," as he called the telescope. Mapping the objects in the sky was clearly a significant undertaking of 19th century astronomers. Mapping the sky continued throughout the 20th century and to this day with more and larger virtually automated instruments like the Sloan Digital Sky Survey. We are fortunate that his great instrument is still around and can still be used much as it was then. There really is no reason it could not continue its research role in astrometry and photometry of comets asteroids, variable stars and even the new field of extra-solar planet finding, with modern add-on tools of ccd imaging, software and filters.



Top Image: From Jim Swift's website *(http://www.angelfire.com/id/jsredshift/)* IC 4329 Cluster in Centaurus from *RealSky*. Jim labelled the image using *Megastar*.
Bottom Image: IC 4329 Galaxy Cluster in Centaurus by Jim Riffle. He made the image with a C-18 and an SBIG ST-2000 CCD camera.

After publishing these discoveries, Dr. Howe turned more of his attention and the 20-inch telescope time to "shallow-sky" objects, measuring, observing and calculating the orbits of numerous comets and aster-

Continued on page 6

observers deck

The Extra-Galactic Discoveries of Dr. Herbert A. Howe

Continued from page 5

oids, in addition to his teaching duties and becoming a dean of the university. Dr. Howe and his students made and published thousands of measurements of comets and asteroids using the Bruce Micrometer. During the same period, an assistant, Vesta Slipher at Lowell Observatory was using a 24-inch Clark refractor. After many failures he was beginning to get the hang of taking spectral photographs of these mysterious nebulae and realizing that some of these objects had significant red-shifts in their spectral lines. The next great period of discovery in astronomy was just beginning.

November 2006 will mark 80 years since Dr. Howe died. Perhaps one way to honor "our" pioneer astronomer will be for DAS and other FRASC astronomers to adopt the list of 60 IC galaxies as their next challenge in deep-sky observing. We have the Messier List, the Caldwell list, the Herschel 400 and the Herschel 2 lists. We now have 60 very faint, very challenging galaxies and nebulae to re-discover for ourselves—we can call them the "Howe Objects." These are not "low-hanging fruit" for deep-sky objects and locating them will require a fairly large telescope and good observers, or a good CCD camera to image. Observe them and take good notes and images. The descriptions in the Dreyer catalogs still need improvements and followup observations even in the third century of Chamberlin Observatory's 20-inch Clark equatorial telescope log books.

—*Clear Skies and Good Luck!*

DAS Annual Banquet
Sat., March 18, 6 to 9 P.M
at The Grange in Castle Rock
Speaker: John Bally
Reservation monies must be received by March 11.
Mail to:
Steve Solon
9774 W. Elmhurst Pl.
Littleton, CO 80128-5199
See February's newsletter or *www.thedas.org* for more information.

Financial Statements Available to Members

If you've ever wondered how your $35.00 membership dues are used, here's your chance to find out. Annual DAS financial statements have been prepared, including Statement of Activities (income statement) for 2005; Comparative Statement of Financial Position (balance sheet) for Dec. 31, 2004 and Dec. 31, 2005; and Notes to the Financial Statements. Copies will be available at the annual banquet or may be picked up by members at Chamberlin Observatory.—*Sandy Shaw*

March Skies

Continued from page 1

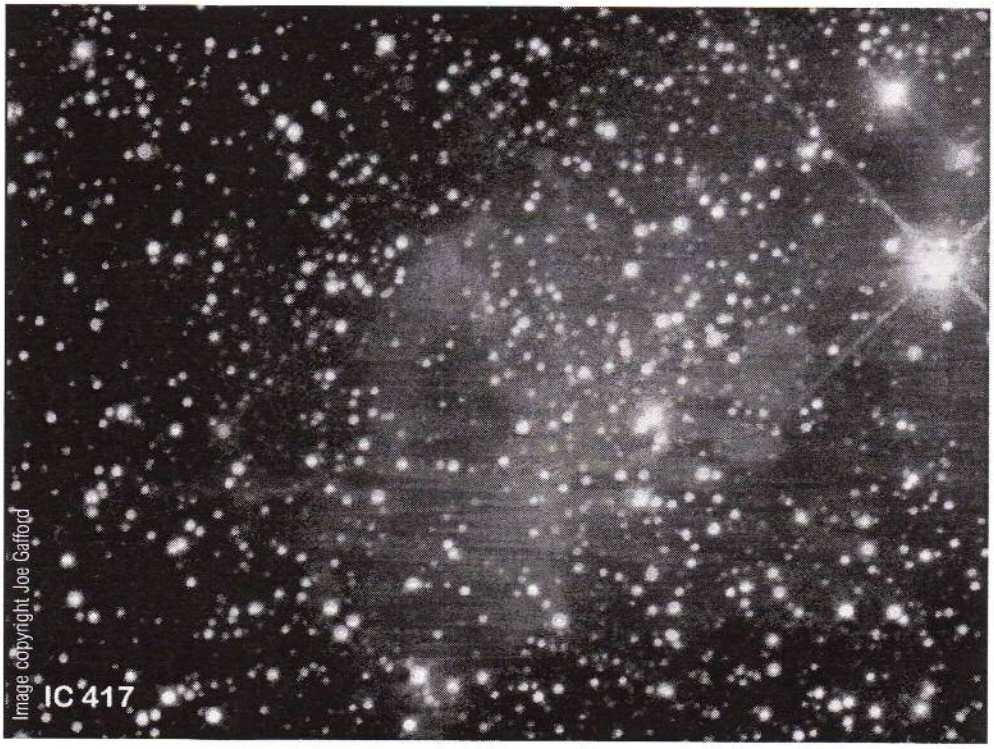
minute you spend searching out their beauty.

PLANETARY REPORT

Mars and Saturn continue their stately traverse high overhead, the latter showing its magnificent 44" ring system, while Mars falls behind Earth and shrinks to a mere 6". Mighty Jupiter slides above the horizon near midnight as the month opens, balancing the scales in Libra and spanning a generous 41" in diameter. This gas giant shows well in the smallest of scopes and its many surface belt features are a superb test of optics in larger instruments.

For early morning risers, Pluto hovers near the galactic center and tasks the astromettle of any prospective hunter. Seductive Venus rises shortly after 4 a.m. mid-month, riding Capricornus the Sea Goat ahead of Neptune, Uranus, Mercury and the rising Sun.

—*Prepared by Public Night Team 3: Norm Rosling, Bill Ormsby, David Shouldice, Stuart Hutchins and Steve Solon.*



IC 417 in Auriga
This image was taken at the EGK site through Joe's 18-inch f/4.5 telescope with an ST-2000XM CCD camera. He made 10-, 10-, 7-, and 10-minute exposures of LRGB respectively.

observers deck

NASA's Space Place

Snowstorm on Pluto

by Dr. Tony Phillips

There's a nip in the air. Outside it's beginning to snow, the first fall of winter. A few delicate flakes tumble from the sky, innocently enough, but this is no mere flurry.

Soon the air is choked with snow, falling so fast and hard it seems to pull the sky down with it. Indeed, that's what happens. Weeks later when the storm finally ends the entire atmosphere is gone. Every molecule of air on your planet has frozen and fallen to the ground.

That was a snowstorm—on Pluto.

Once every year on Pluto (one Pluto-year—248 Earth-years), around the beginning of winter, it gets so cold that the atmosphere freezes. Air on Pluto is made mainly of nitrogen with a smattering of methane and other compounds. When the temperature dips to about 32 K (-240 C), these molecules crystallize and the atmosphere comes down.

"The collapse can happen quite suddenly," says Alan Stern of the Southwest Research Institute. "Snow begins to fall, the surface reflects more sunlight, forcing quicker cooling, accelerating the snowfall. It can all be over in a few weeks or months."

Researchers believe this will happen sometime during the next 10 to 20 years. Pluto is receding from the warmth of the Sun, carried outward by its 25% elliptical orbit. Winter is coming.

So is New Horizons. Stern is lead scientist for the robotic probe, which left Earth in January bound for Pluto. In 2015 New Horizons will become the first spacecraft to visit that distant planet. The question is, will it arrive before the snowstorm?

"We hope so," says Stern. The spacecraft is bristling with instruments designed to study Pluto's atmosphere and surface. "But we can't study the atmosphere if it's not there." Furthermore, a layer of snow on the ground ("probably a few centimeters deep," estimates Stern) could hide the underlying surface from New Horizon's remote sensors.

This artist's rendering shows how Pluto and two of its possible three moons might look from the surface of the third moon.

Credit: NASA/ESA and G. Bacon (STSci)

Stern isn't too concerned: "Pluto's atmosphere was discovered in 1988 when astronomers watched the planet pass in front of a distant star—a stellar occultation." The star, instead of vanishing abruptly at Pluto's solid edge, faded slowly. Pluto was "fuzzy;" it had air. "Similar occultations observed since then (most recently in 2002) reveal no sign of [impending] collapse," says Stern. On the contrary, the atmosphere appears to be expanding, puffed up by lingering heat from Pluto's waning summer.

Nevertheless, it's a good thing New Horizons is fast, hurtling toward Pluto at 30,000 mph. Winter. New Horizons. Only one can be first. The race is on. . .

Find out more about the New Horizons mission at *http://pluto.jhuapl.edu.* Kids can learn amazing facts about Pluto at *spaceplace.nasa.gov/en/kids/pluto.*

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

The Edmund G. Kline Dark Site: Observing and imaging under some of the region's finest skies. For site information, please visit the DAS website.

nasa's space place

About the Denver Astronomical Society

Membership in The Denver Astronomical Society is open to anyone wishing to join. The DAS provides trained volunteers who operate the **University of Denver's Historic Chamberlin Observatory,** which the DAS helped place on the National Register of Historic Places. First light at Chamberlin in 1894 was a public night of viewing, a tradition the DAS has helped maintain since its founding in 1952.

The DAS is a long-time member in good standing of the **Astronomical League** and participates in **NASA's Project Astro** program.

The DAS' credo is to provide its members a forum for increasing and sharing their knowledge of astronomy, to promote astronomical education to the public, and to preserve **Historic Chamberlin Observatory** and its telescope in cooperation with the University of Denver.

The DAS is a 501(c)(3) tax-exempt corporation and has established three tax-deductible funds: the Van Nattan-Hansen Scholarship Fund, the Chamberlin Restoration Fund, and the Edmund G. Kline Dark Site Fund. To contribute, please see the bottom of the membership form for details.

More information about the DAS, its activities, and the special tax-deductible funds is available on the DAS web site at *www.thedas.org.*

APPLICATION FOR MEMBERSHIP TO THE DENVER ASTRONOMICAL SOCIETY

New ☐ Renewal ☐

Name: _____

Address: _____

City, State, Zip: _____

Phone numbers: Home ( ) Work ( )

E-mail Address: _____

Occupation: _____

Other Interests: _____

(Students Only) School: _____ Grade: _____

Do you want to download the newsletter in PDF format from our website instead of by postal mail?

Yes ☐ No ☐

Do you want the above information excluded from the yearly roster?

Yes ☐ No ☐

Please Circle All That Apply:

Regular Membership: $35 Students: $12 *(Students under age 23)* ..... $ _____

Astronomy Magazine/$34

Sky & Telescope Magazine/$32.95

..... $ _____

Van Nattan Scholarship Fund ..... $ _____

Chamberlin Restoration Fund ..... $ _____

Total Amount Paid ..... $ _____

Please make donations to the Dark Sky Site Fund payable to the DAS EGKDS Fund and mail to **Steve Solon, 9774 W. Elmhurst Place, Littleton, CO 80128-5199.** ***Please make other amounts payable to the Denver Astronomical Society and mail along with this completed form to*** **Brad Gilman, DAS Treasurer, 7003 S. Cherry St., Centennial, CO 80122-1179.**

Denver Astronomical Society

c/o Chamberlin Observatory
2930 East Warren Avenue
Denver, Colorado 80210