

# THE SPECTRUM

Newsletter of the  
BUFFALO ASTRONOMICAL ASSOCIATION, Inc.

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## ASTRONOMER FROM THE PAST

### LALANDE

BORN JOSEPH VERONE LE FRANCOIS DE LALANDE, IN BOURG-EN-BRESSE, AIN ON JULY 11, 1732, AND PASSED AWAY IN PARIS ON APRIL 4, 1807.

HE DEVOTED HIMSELF TO MATHEMATICS AND ASTRONOMY AND WAS SENT BY THE ACADEMY IN 1751 TO BERLIN TO DETERMINE THE PARALLAX OF THE MOON. ALSO NICHOLAS LOUIS DE LACAILLE WENT WITH THIS OBJECTIVE TO THE CAPE OF GOOD HOPE. AFTER HAVING FINISHED HIS OPERATIONS AT BERLIN, HE WAS CHOSEN A MEMBER OF THE ACADEMY OF SCIENCES IN PARIS IN 1753. NO VOLUMES OF THEIR TRANSACTIONS APPEARED WHICH DID NOT CONTAIN SOME IMPORTANT COMMUNICATIONS FROM HIM. IN 1763, HE WAS APPOINTED PROFESSOR OF ASTRONOMY IN THE COLLEGE DE FRANCE WHERE HE LECTURED WITH GREAT SUCCESS TO THE END OF HIS LIFE. IN 1793 HE HAD BEEN APPOINTED DIRECTOR OF THE PARIS OBSERVATORY. HIS CHIEF WORKS ARE "TRAITE D'ASTRONOMIE" IN 1764 AND "BIBLIOGRAPHIE ASTRONOMIQUE" OF 1803. HE WROTE ALL THE ASTRONOMICAL ARTICLES FOR THE "GREAT ENCYCLOPEDIA" IN 1764 AND CONTRIBUTED TO VARIOUS SCIENTIFIC PERIODICALS. HE ALSO EDITED THE "CONNAISSANCE DES TEMPS".

DARWIN CHRISTY

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## DEADLINE FOR THE JULY-AUGUST SPECTRUM

IS FLAG-DAY, JUNE 14TH

In 1979 the first gravitational lensed Quasar was discovered and today 5 others have been confirmed.

MAY - JUNE  
1985

## ANNUAL MEMBERSHIP DUES

Family Membership - \$ 15.00

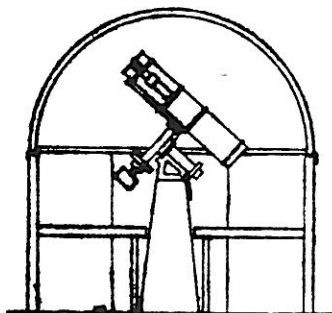
Regular Membership - \$ 10.00

Student & Senior Citizen - \$ 5.00

Subscription only - \$ 2.00

PLEASE make payments to Claudia Bielinski either at one of the meetings or send your payment to her at 5450 Clinton St., Elma, N. Y. 14059.....

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## SOME THOUGHTS - REFLECTIONS & SS-433 - CONTINUED --

The second question of why did SS-433 show a cool-gas spectrum became much more difficult to explain, and indeed this most obvious question was for the most part ignored by those who in those early days of 1979 were studying SS-433 ---except, of course, by those people at Ohio State who's work provided the information in this article. Central to the ultimate resolution of this cool-gas spectrum problem was the eventual connecting of two available clues early in the investigation (1979/80). The first clue was the paradox of explaining how material could be accelerated to such high speeds, which would require enormous energy, but unless such an accelerating mechanism was close to being 100% efficient, it should be heating the gas and the thermal energy would be apparent and therefore the material should not likely be cool at the end of such accelerations on the return trip it would have to lose energy by radioactive cooling which also should be visible, but was not in any of the objects spectra. Finally, in any event, the material should not cool to the observed temperature.

The second clue was that the Doppler shifted spectral lines observed were quite narrow when compared to the speed of the material represented by the Doppler shifts themselves. From analyses using the special relativistic Doppler shift formula the true speed of the material was estimated between 70 & 80 thousand kilometers per second, yet the width of the lines if related entirely to the range of velocities within the gas limited that range to just a few thousand kilometers per second, or only about 5% of that estimated. Now, a good understanding of all this involves knowing that certain characteristics and properties of the moving and emitting gas itself, such as its density or atoms per cubic centimeter, are within a certain critical range, and with being familiar with something called reco:

bination times involving protons capturing electrons and then photons given off by radiating from hydrogen atoms. This is some pretty heavy stuff for those of us who aren't scientists. Anyway, in the case of SS-433 these things could be measured from earth, and since its distance was known (3.5 Kpc), the size and other such characteristics of the emitting region including its distance from its source, could be established. It would be expected that the larger it was the farther away from its source it would be.

So the two clues considered together seemed to indicate that in SS-433 a very large emitting region, probably hundreds of astronomical units (AU's) away from its source, was present in what was most likely a rotating binary system with an immense and highly unusual electromagnetic field with some strange mechanism creating havoc within the field and out into the emitting regions.

The picture or model of SS-433 which now begins to take shape from these early investigations is that of a binary star system the size of about one astronomical unit consisting of perhaps a early type massive supergiant (~30 solar masses) with a small secondary, probably no more than a couple solar masses. The system appears to have a rotating magnetosphere somehow causing cold stellar wind material to be flung outward in streams or jets through the field, which itself is being distorted by torques produced by the gravitational interaction of the two components, and then this material is somehow finally trapped in two very remote regions from its source and thru some mechanism accelerated to super high speeds. Then by precession or rotation of that magnetosphere these materials would then glow and give off the emission lines observed on earth.

At this early time (1979/80) all the theoretical descriptions being tossed around were relying on some type of jet phenomena as the origin of the Doppler shifted spectra, and such theories sought to describe the periodic motion of the emitting regions (~160 days) in terms of jets. However, such models couldn't help to describe the cause of these regions or why they would glow. The most popular model for example, was that of a spinning magnetic neutron star with accretion disks which would explain the production of the jets, but in a neutron star such jets are produced only locally, and they are also not cool. SS-433 emission regions however were cool and they were far away from either companion. So SS-433 didn't fit the popular model.

A possible solution to this dilemma was that maybe jets were being produced, but they were being changed somehow to look cool by perhaps interacting with other cool dense gas and then some mechanism, such as a particle or ion beam accelerator, or some other super efficient large scale magnetic field accelerator would fling atoms and thus hydrogen alpha photons through a co-moving electron cloud to collide with distant cool gas causing the observed effect. Sounds pretty complicated doesn't it?! However, if a neutron star was involved, this magnetic field acceleration mechanism would require a very large scale ordered field with the distant dipoles one would expect from a substantial stellar magnetic field, but the star's rapid spinning would be expected to twist and distort the field and through the energy expended rapidly reduce the star's spin rate. But SS-433 was inconsistent with this magnetic neutron star jet pattern, and beside little was understood about the mechanisms which produce such jets anyway. Also, for a neutron star to have enough energy for such effect, the super nova it came from would have to be of recent origin, and SS-433 had been estimated to be around 100,000 years old - not very recent.

When considering the masses, orbital periods, and precision involved in the 2 components of SS-433, and noting that any orbiting body has angular momentum by its intrinsic spin, making the primary component a slightly squashed spheroid like Jupiter, and finally considering the torque effect of the secondary component in distorting the equatorial bulge causing the magnetic axis to appear to precess slowly in the opposite sense of motion, SS-433 becomes consistent with a massive early type super giant system with small companion rather than a neutron star type system. The stellar magnetic field of such a supergiant (approximately

30 K. gauss) would be of the magnitude estimated to produce a distant magnetic field strong enough to effect the acceleration of a large particle beam to extreme velocities as were being observed. The two previous clues, concerning narrow lines in the spectrum and the coolness of the emitting region gas, seemed more likely to fit this type of a system.

So now we have an idea of how these distant moving regions came about, and the only major question remaining was what was causing these regions to glow to kind of bring everything so far together the picture emerging of SS-433 is that of a large, young, blue star and small companion with its stellar wind being contained by a rotating magnetic field and through spinning accelerating the material outward along the field lines of each magnetic pole distorting the field itself, and, adding further distortions and assorted torque effects from the companion, eventually trapping a region of cool radiating gas. This region then shares the rotational motion of the precessing magnetosphere, is further accelerated, and subsequently divided equally between prograde and retrograde field lines along the poles. When the materials encounter each other a collision of sorts takes place in which some thermal energy is radiated causing the observed emissions, but actually the process is much more complicated and involves a series of shock wave phenomena in these regions.

First, a so called collisionless shock results from Coriolis type forces where the prograde material meets the retrograde stuff. The shock is collisionless because of something having to do with the radial motion of the outward material changing to gyromotion thereby transforming momentum and tightening the turn away from the incoming material and then being stopped rather abruptly - and also at this meeting point the density of the stellar wind is low where few collisions can occur between particles.

Second, the collisionless shock encounters the retrograde material sweeps it up and eventually produces a second shock, this time a regular collisional type shock or so called isothermic shock, generating low temperature thermal energy. It is the gas in this region which shares the rotational motion of the magnetic field that produces the cool gas Doppler shifted spectra, and since this phenomena will exist in material emanating from each pole there will be two such regions each exhibiting oppositely directed motion. In short, what you finally have is a region of cool radiating gas trapped by the magnetic field on the sides, collisionless shock behind, and an isothermal shock in front. This region then shares the rotational motion of the precessing magnetosphere producing the observed Doppler motion in the emission lines.

In conclusion then, if any of the preceding makes sense SS-433 is really a very unusual and very complicated binary star system. Remember, for example, that the two opposite emitting regions are somewhere on the order of 700 astronomical units apart, which, if you think about it, means that when one of the regions is closest to an observer on earth light from the opposite region will take another 4 or 5 years to reach that same observer. You can imagine how difficult accurate observation of this object must be. Anyway it would seem that the magnetospheric model presented in this article seems to answer most of the questions and that the Ohio State team was on line above the others at that time. But, because my information remember, is about 4 years old, much remains to be told, and I therefore leave it up to someone else who has more recent data to bring us all up to date with a future SPECTRUM article on SS-433.

Ken Biggie

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A BOOK YOU WON'T LIKE

I've just read a book, Ken Fulton's "The Light-Hearted Astronomer", and want to warn you to avoid it. The author presumes to introduce novices to the "jungle" of amateur astronomy. He starts by offering the newcomer the choice between following the scientific or the aesthetic path and recommends the latter because, as Fulton puts it, "differential calculus gave me hemorrhoids."

He talks at length about choices in telescopes and manufacturers' claims for them. He assumes the unsophisticated beginner will seek the largest telescope he can incur debt for and will inevitably be disappointed by his choice. To emphasize mundane points, Fulton uses one-liners and wisecracks, sometimes devoting whole paragraphs to them. He winds up by recommending refractors.

Early in this narrative the author appears to place the reader in the fool category and talks down to him ever after. He has apparently read somewhere that one should write as one speaks, but he carries a good principle too far. Not every form of verbal expression needs to be written down and preserved. To say it as Fulton might--that's what erasers are for.

To be quite fair to the author, at the outset of the second chapter he warns the reader that he will put words into his mouth. He adds with some delicacy "if you find you can't stand the taste of them without barfing, feel free to spit them out . . ." How would you like a fellow such as this putting words into your mouth?

This book is available from AstroMedia, the parent company of "Astronomy" magazine. Some of its chapters originally appeared in "Astronomy", according to Fulton, which says little for that publication. If you wish to confirm or refute my opinion of this book, you're welcome to read my copy.

Rowland Rupp

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## ASTRONOMICAL HAPPENINGS

**SOLAR-** A PARTIAL ECLIPSE OF THE SUN WILL BE OBSERVED ON MAY 19TH ACROSS NORTHERN ASIA, JAPAN, THE YUKON, GREENLAND, ICELAND, AND OFF THE NORTHERN PORTION OF THE SCANDINAVIAN COUNTRIES.

ON THE ZODIACAL BELT THE SUN WILL LEAVE TAURUS ENTERING GEMINI IN MAY. THEN IN JUNE IT WILL DROP FROM GEMINI INTO CANCER (THE MOON CHILD), AS THE ASTROLOGERS NOW LABEL IT. ALSO THE ARRIVAL OF THE SUMMER SOLSTICE WILL OCCUR NEAR 05:44 A.M. EST ON JUNE 21ST. THE DAYS WILL START TO SHORTEN AND THE NIGHTS WILL BECOME LONGER WHICH COULD PROVE TO BE MUCH BETTER FOR THE OBSERVER'S TIME.

**LUNAR-** THE MOON'S PHASES WILL APPEAR AS FOLLOWS:-

FULL MOONS (FLOWER) MAY 4TH AND (STRAWBERRY) JUNE 2ND; ALSO (BUCK) ON JULY 2ND

LAST QUARTER ON MAY 11TH & JUNE 10TH

NEW MOON ON MAY 19TH & JUNE 17TH

FIRST QUARTER ON MAY 27TH & JUNE 25TH

CONJUNCTIONS INCLUDE:-

SATURN ON MAY 5TH & JUNE 1ST & 29TH

URANUS ON MAY 6TH & JUNE 3RD & 30TH

NEPTUNE ON MAY 7TH & JUNE 4TH

JUPITER ON MAY 11TH & JUNE 7TH

MERCURY ON MAY 17TH

MARS ON MAY 21ST

VENUS ON MAY 15TH & JUNE 14TH

AN ECLIPSE WILL HAPPEN ON MAY 4TH ALTHOUGH NOT TO BE OBSERVED FROM THIS AREA.

**PLANETARY-** A CONJUNCTION

OF MARS & ALDEBARAN WILL HAPPEN ON MAY 11TH

VENUS WILL BE AT GREATEST BRILLIANCY ON MAY 9TH

OPPOSITIONS ARE:- SATURN ON MAY 15TH

URANUS ON JUNE 6TH

NEPTUNE ON JUNE 23RD

EARTH WILL BE AT APHELION (FARTHEST DISTANCE FROM THE SUN) ON JULY 5TH.

**METEORS-** FOR MAY:-

1ST - PHI BOOTES

3RD - OMEGA SCORPIIDS

4TH - ETA AQUARIDS \*\*\*

15TH - O CETIDS

17TH - ZETA HERCULIDS  
30TH - EAT PEGASIDS

FOR JUNE:-

3RD - TAU HERCULIDS

5TH - CHI SCORPIIDS

8TH - LIBRIDS

8TH - ARIETIDS (DAYTIME)

9TH - ZETA PERSEIDS (DAYTIME)

9TH - ALPHA SCORPIIDS

11TH - SAGITTARIIDS

13TH - OMICRON OPHIUCHIDS

15TH - LYRIDS (NOT THE APRIL LYRIDS)

20TH - OPHIUCHIDS \*\*

26TH - CORVIDS (NEW)

28TH - BOOTIDS

28TH - DRACONIDS \*\*\*\*\*

30TH - BETA TAURIDS (DAYTIME)

DARWIN CHRIST

OBSERVE:

OBJECTS WITHIN 1.5° OF MESSIER OBJECTS

Ever say "Where the \*MMMM\* is NGC 3077! It should be right here!". All too often objects are not seen through telescopes because they could not be located. Getting the telescope pointed to the object to be viewed is often more difficult than seeing it. I feel that once you know an object is in the field you can see fainter galaxies, clusters and nebulae. This is simply because you can concentrate more strongly on a small area than a large area you're sweeping and circling around in.

The following list of Messier objects with other objects close-by, in angular separation, should help hone one's observing skills. Even so, some objects will still be quite challenging, especially for smaller scopes.

Field required (FLD REQ) is the diameter of a circle that all the objects will fit within. This field is usually not centered on the Messier object. Separation (SEP) from the Messier object is in minutes of arc. The direction from the Messier object is easily found by consulting an atlas as Tirion's or Beccar's.

Note that the moon's diameter is 31' so you can calibrate your scope/eyepiece combinations. The separations listed can then be thought of as equivalent moon-diameters or field-of-view diameters.

GC - Globular Cluster

OC - Open Cluster

GAL - Galaxy

PL - Planetary Nebula

NEB - Nebula

#	MESSIER OBJ.		OTHER OBJECT(S)			OBJ	FLD REQ	SEP
	RA	DEC	NGC#	MAG	SIZE			
103	01h29m	60°26'	654	9	5'	OC	3°	105'
			659	10	5	OC		80
			663	7	11	OC		99
77	02 40	-00 14	1055	11	7x2	GAL	1	32
36	05 33	34 06	M38	7	20	OC	4	92
			1893	8	12	OC		128
			1907	10	5	OC		114
35	06 06	24 21	2158	12	4	OC	1	23
46	07 40	-14 42	M47	5	25	OC	3	79
			2423	7	20	OC		90
			2438	11	68"	PL	NOTE 1	
81	09h51m	69°18'	M82	8	21x10'	GAL	1.5°	38'
			3077	11	2	GAL		46
95	10 41	11 58	M96	10	5x4	GAL	1	43
105	10 45	12 51	3384	10	4x1	GAL	1	8
			3389	13	2x1	GAL		9
97	11 12	55 18	M108	10	8x1	GAL	1	48
65	11 16	13 23	M66	9	8x3	GAL	1	20
			3628	11	12x2	GAL		37
98	12 11	15 11	M99	10	5x4	GAL	3	78
			9 OTHER GALAXIES - NOTE 2					
106	12h16m	47°35'	4217	12	4x1'	GAL	1°	35'
			OTHER GALAXIES - NOTE 3					
100	12 20	16 06	4397	13	0.7	GAL	1	37



84	12 23	13 10	OTHER GALAXIES - NOTE 4						
			M86	10	2x1.5	GAL	1	19	
85	12 23	18 28	4293	12	4x2	GAL	1.5	59	
			4394	12	2.3	GAL		8	
59	12 39	11 55	M60	9	2	GAL	1	24	
60	12 41	11 49	4638	12	1x.5	GAL	1	2	
			4647	12	2x1.5	GAL		14	
53	13h11m	18°26'	5053	10	3.5'	GC	1.5	56	
101	14 01	54 35	5422	12	3x.5	GAL	2	53	
			5473	11	1x.7	GAL		43	
			5474	11	4x3	GAL		44	
			5485	12	1x.7	GAL		53	
13	16 40	36 33	6207	12	2x1	GAI	1	28	
6	17 37	-32 11	6383	5	6	OC	3	71	
			6404	10	3	OC		62	
			6416	8	20	OC		54	
7	17h51m	-34°48'	6453	11	0.7'	GC	2	35'	
			H18	9	15	OC		40	
			NO #	14	?	PL		27	
8	18 01	-24 23	M20	-	30	NEB	3	86	
			M21	6	10	OC		110	
17	18 18	-16 12	M18	7	12	OC	2	59	
			I4706	-	6x4	NEB		19	
11	18 48	-06 20	6704	9	5	OC	2	64	
71	19 51	18 39	H20	10	10	OC	1	27	
27	19 57	22 35	6830	9	8	OC	3	120	
15	21 28	11 57	NO #	14	1"	PL	NOTE	6	
52	23 22	61 20	7635	8.5	3	PL	1	36	

#### NOTES

- 1) PLANETARY IS WITHIN M46
- 2) 9 OTHER GALAXIES ARE WITHIN 3° DIAMETER FIELD
- 3) 3 OTHER GALAXIES WITHIN 2° FIELD; 7 WITHIN 3° FIELD
- 4) 5 OTHER GALAXIES IN 1° FIELD; 9 IN CHAIN IN 2° FIELD
- 5) NGC 6404 IS A VERY RICH OPEN CLUSTER
- 6) PLANETARY IS WITHIN M15, 4' FROM CENTER ON NE SIDE, SINCE DIAMETER IS 1" AND MAG 14 BIG SCOPE & HIGH MAG

In the next newsletter will appear OBJECTS NEAR BRIGHT STARS. This list of 100+ objects within 1.5° of stars brighter than mag 5 will be available at the March meeting. This is a month before its newsletter appearance.

Bill Smith

#### PROFILE

THOMAS WILLIAM WEBB (1807 - 1885)



*Thomas William Webb*

Webb's Celestial Objects for Common Telescopes is well known to every practical astronomer. This year, on May 19th to be precise, is the one-hundredth anniversary of the death of its celebrated author. I thought it appropriate,

therefore, that a small biography of T.W. Webb should be included in this May-June issue of the Spectrum to mark the occasion.

Thomas William Webb was born on December 14th, 1807, the son of the Rev. John Webb, rector of Tretire in the county of Hereford, England; Thomas's mother died when he was only a child.

Early in life he showed signs of being unusually gifted and when a lad he came to love the natural sciences. His father was his first teacher. Thomas was deeply interested in astronomy from an early age and when only nineteen years old, was making useful observations. His first telescope thought to have been a somewhat inferior 4-inch fluid achromatic on the Barlow principle. He quaintly remarked about this telescope that 'much of the light went the wrong way. Later he added a 3.7-inch Tully achromatic 'of fair defining quality.' These two instruments were the only ones he used, poorly mounted and with no observatory, for making all of the original observations that went into the first edition of Celestial Objects.

Thomas graduated from Magdalen Hall, Oxford, taking a degree with honours in mathematics, when he was twenty-two years old. That same year he was ordained at Hereford and became curate at Pencoyd, a post which he held for twenty-five years. During this time he also served for a long period as precentor and as a minor canon of Gloucester Cathedral. On May 16th, 1843, at the age of thirty-six, Webb was married to the daughter of Mr. Arthur Wyatt of Troy House, Monmouth. She is described as being 'an able and accomplished woman.' Mr. Webb left Pencoyd to be installed as vicar of Hardwick, on the Welsh border, where he stayed until his death in 1885.

It is remarkable that despite his conscientious fulfilment of arduous clerical duties in a scattered parish, was able to accomplish so much scientific work that stands up to the closest scrutiny and criticism.

In August 1859, he was writing to a friend of his, Mr. Raynard:

'A little work of mine, Celestial Objects for Common Telescopes will be published by Longman very shortly. I have had it in hand for a long while, having had so many things to attend to, which took up unavoidably a great deal of time, and I could make but slow progress.....'

The little volume appeared in the same year. Its readers immediately appreciated that the author was not only a superb and well-trained observer but could also describe the wonders of the heavens 'in luminous and delightful English.'

At this time, Webb acquired a very fine 5½-inch object glass by Alvan Clark which he mounted and made effective use of for many years.

About 1867 Mr. Webb's father presented him with a 9½-inch equatorial reflector by G.H. With of Hereford. This was housed in a Berthon observatory. At this time he was preparing the second edition of Celestial Objects. This was made necessary by rapid advances in observational astronomy which were due in no small measure to the first edition of his book. Despite arduous clerical duties, he carefully and patiently revised the book and the second edition enlarged and greatly improved, appeared in 1868. The third edition (revised) came out in 1873 and a fourth edition, still further extended, was published in 1881. (I have a copy of this. F.W.P.)

As well as Celestial Objects and his scattered observational records, Mr. Webb wrote two treatises, one on optics and another on the sun, as well as contributing to learned journals such as Student, Intellectual Observer, Nature, Knowledge and English Mechanic. In addition, his scant leisure time was taken up with voluminous correspondence not only with the learned but also with beginners in astronomy. He gave unstintingly of his time to answering the humblest of inquiries which other less gifted and less celebrated men might have ignored. Arthur Mee writes that 'with fear and trembling' he applied to Mr. Webb 'for advice

in the pursuit of Astronomy.' He was overjoyed when, a few days later, there arrived one of these unique epistles which ended:

'If you think I can be of any further service, pray do not hesitate to write at any time.'

Two humorous anecdotes from his private writings are worth quoting. Referring to the visit to London of Dr. Gould of Cordova, Argentina, Webb states that Dr. Gould apparently was not impressed with London's skies:

'Since he had been in London he said he had seen a cheese two or three times and they told him it was the sun.'

On the apparent lack of interest shown by the scientific world in the great comet of 1882, Webb says:

'I could find it in my heart to set the whole lot of observers intellectually in the stocks for their behaviour and pelt them with rotten comet tails.'

In a more serious vein he continues:

'The whole thing appears to me an inscrutable mystery; but so, indeed, are many other things much closer at hand, which modern scientific men find it convenient to ignore.'

Although he admitted that the astronomical establishment supported a currently attractive idea about the origin of the solar system, Webb confessed that:

'I have little affection for the Nebular Hypothesis..... I see difficulties which I cannot get over if others can.'

In later life Mr. Webb deeply felt the loss by death of one friend after another. The bitterest blow came on September 7th, 1884 with the death of his beloved wife of forty-one years. Her sudden demise and his childlessness left Mr. Webb in loneliness and sorrow and this undoubtedly hastened his own passing. The following spring, on May 19th, 1885, Mr. Webb died within a few months of his 80th year. His ashes were interred with those of his wife in the cemetery of Mitchel Troy.

Regrettably, apart from a few brief and loving notices in learned journals, no adequate memoir appeared until the publication eight years after Webb's death of Arthur Mee's 'The Rev. T.W. Webb: In Memoriam.' This was included as an appendix in Mee's book Observational Astronomy (1893).

A tribute from one of Mr. Webb's intimate friends embodies much:

'No one could have known dear Prebendary Webb without really loving him. Devoted to his ministerial work: so gentle, so patient with his sick and poor; so self-denying, industrious, humble-minded; and yet a man of all but the highest scientific attainments in many directions. In his special subject he will ever be regarded as taking highest rank. It was one of the greatest blessings of my life to have him as a personal friend.'

Although the world seemed unaware, it was made poorer by his loss. These later years have seen few lives to compare with his, as holy and beautiful as that of Thomas William Webb.

Fred W. Price

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### SPY & TELL

Phil Cizdziel, former B.A.A. member, is now living in Santa Barbara, and is working at the Hughes Corporation doing research on infrared detectors. An article by Phil and two other astronomers will appear in the May issue of Astronomy Journal. The article is entitled "Multiaperture Infrared Photometry of Nuclei of Spiral Galaxies."

Bill Smith has moved to Ashville, near Jamestown, where he is working in an auto plant. We are happy that he plans to continue his membership in the B.A.A.

An interview with Ernst Both, Director of the Buffalo Museum of Science, on "Science Museum Battling to Survive - and Improve" appeared in the Sunday edition of the Buffalo News on March 17th.

Dave Bertuca has had a very busy year. He graduated from U.B. in May '84 with a Master of Library Science degree, and in July he and Cindy were married and moved to Wales, N.Y. where they enjoy the dark skies. They have been working for seven months or so, renovating part of a house, and are ready to move in.

Dave works for the University of Buffalo, and teaches photography in the Maryvale Adult Education Program, and is still working in photography.

Marilou Bebak applied to NASA last fall, requesting that she be considered a teacher passenger on board one of the upcoming Space Shuttle flights.

Chris Biggie, son of Ken and Diane, broke his leg sledding on February 18th. The cast has been removed and he is now getting around on crutches.

Cliff Stoll, who is known to many members, has been working on the Space Telescope at Johns Hopkins University in Baltimore. His picture appears on pg. 298 in the April issue of Sky & Telescope. He is now at Berkeley working on the 400" telescope.

Claudia Bielinski is always on the move, flying and driving here and there with great enthusiasm. She made a hasty trip to Atlantic City to spend a few hours with a friend. She left Buffalo by plane on a morning in March and flew back that night.

Tristan and Debbie DiLapo are making progress on their new home on Cole Rd. in North Boston, and hope to have it finished by the end of July.

Shaun Hardy is giving a lecture on Meteors at the Corning-Elmira meeting on June 7th.

Larry Carlino has moved into his new ranch house in Rapids. He is planning to set up a nursery business growing trees and shrubs.

A picture of Jerry Morris along with three other members of the Amherst Male Glee Club appeared in March in the Buffalo News article about the Glee Club and the program it was giving.

Carl Milazzo and Tristan DiLapo went out to Beaver Meadow around new moon in March and observed with Tristan's 18" Dobsonian. They saw 70 deep-sky objects in the winter and spring constellations. The NGC objects were brilliant and spectacular.

There are three degrees in the Masonic Order to become a Master Mason. The first degree is that of an Entered Apprentice, second a Fellow-Craft and finally a Master Mason. The ritual work to become an Entered Apprentice and Fellow Craft must be memorized by the person, but there are other parts which are explained to him. These are also committed to memory by those who give it. One is the Lecture of Reason and another an Historical Lecture. These lectures require 15 to 30 minutes to give and explain the origin of the lodge as well as shown with slides.

Darwin Christy was appointed as temporary Worshipful Master to give these lectures, one of which was on March 2 1985 and again on May 6th.

Doris Koestler and hubby, Bill, are leaving on June 9 for a twelve day stay in Hawaii.

Walt Whyman stood up on his feet for the first time (April 11) since his stroke on January 15. His arm is still limp, and he is still unable to speak. His mind is clear and he can nod his head in response to questions. I'm sure he would appreciate hearing from you.

Edith L. Geiger

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FAITH IS TO MAN WHAT GRAVITY IS TO THE PLANET AND SUNS!

⑤ 1.25 # HAILSTONES FELL IN DUBUQUE, IOWA IN 1882

## SOUTHERN CONSTELLATION

**MICROSCOPIUM** - (THE MICROSCOPE) IS A CONSTELLATION IN THE SOUTHERN SKIES WHICH CAN BE OBSERVED FROM THIS AREA BETWEEN PISCIS AUSTRALIS AND GRUS ON THE EAST AND SAGITTARIUS ON THE WEST; IT IS ALSO BORDERED BY INDUS ON THE SOUTH; AND BY CAPRICORNUS ON THE NORTH.

NOT TOO MANY OBJECTS OF INTEREST ARE FOUND IN MICROSCOPIUM. GALAXIES INCLUDE NGC'S 6923, 6925 & 6958 & I.5105. VARIABLE STARS ARE S, T & U. THREE DOUBLE STARS ARE ALPHA, THETA-2 & IOTA.

ONE INTERESTING THING ABOUT THIS CONSTELLATION, THERE ARE FOUR STARS FROM PISCIS AUSTRALIS WITHIN ITS BOUNDARY; GAMMA, EPSILON, 2 & 3.

### ancient constellation

TARANDUS vel RANGIFER, the Reindeer is a small ancient constellation or faint asterism between Cassiopeia and Camelopardalis. It was formed by Pierre Charles Le Monnier which he called 'RENNE' as a memento of his stay in Lapland when he was engaged in geodetic work in 1736. The Germans had named it 'Rennthier' and Bode inserted it into 'Die Gestirne.'

It is seldom heard of as it had never been really placed onto any charts or maps.

### JUNE OR ZODIACAL CONSTELLATION

**OPHIUCHUS** vel **SERPENTARIUS**, The Serpent-Holder, or Serpent-Bearer is one of the larger constellations in the skies. It is our May constellation and could also be termed as one of the signs of the Zodiac as it lies on the ecliptic, actually the thirteenth sign of the zodiac. It is bordered on the north by Hercules; on the east by Aquila, Serpens Cauda and Sagittarius; on the south by Scorpius; and on the west by Serpens caput, Libra and Scorpius.

Thee, Serpentarius, we behold distinct  
With seventy-four refulgent stars.

-Eudisia

Ophiuchus is represented on the ancient charts as standing on the Scorpion, holding in his hands and across his knees a writhing serpent. The constellation Serpens is the representative of this serpent. This constellation was known to the ancients as early as 1200 B.C. and there is a piece of statuary in the Vatican Museum depicting the tragedy which befell him, that of being strangled by two serpents which were sent because he was to have been the one who thrust a spear into the famous wooden horse of Troy.

There are many objects of interest in Ophiuchus, one of which, in 1604, was a nova, now called 'Kepler's star', is said to have rivaled Venus in brilliancy. The other many objects are as follows; Galaxies - NGC 6384; Globular clusters - NGC's 6171 (M-107), 6218 (M-12), 6235, 6254 (M-10), 6266 (M-82), 6273 (M-19), 6284, 6287, 6293, 6304, 6316, 6325, 6333 (M-9), 6342, 6355, 6356, 6366, 6401, 6402 (M-14), 6426 & 6517; Open Clusters - NGC 6633, H 15, I, 4665, I, 1257 (globular?); Planetary Nebulae NGC's 5309, 6335, 6369, 6572, I, 4603, I, 4604, I, 4634, I, 4657 & I, 4659 also at R.A. 18h 17m dec. 10° 5m, R.A. 17h 41m dec. -25°, R.A. 17h 25m dec. -20°.

Double stars include: X (a variable), Rho, Omicron, Xi, Eta, Tau, and others which are numbered stars. Variable Stars are: Chi (7), R, RR, RU, RY, S, SS, TY, U (38), V, V-1010, V-2048 (66), V-451, V-533, V-566, V-574, V-840 (N-1917), V-841 (N-1848), V-843 (N-1604), V-849 (N-1919), V-986, V-988, X, Y, Z; Novae include N-1604, N-1848, N-1917, N-1919 & N-1976. One other item of interest is Barnard's Star which is a run-away-star located at R.A. 17h 35m dec. +40° 35m.

DEADLINE FOR THE JULY-AUGUST SPECIAL

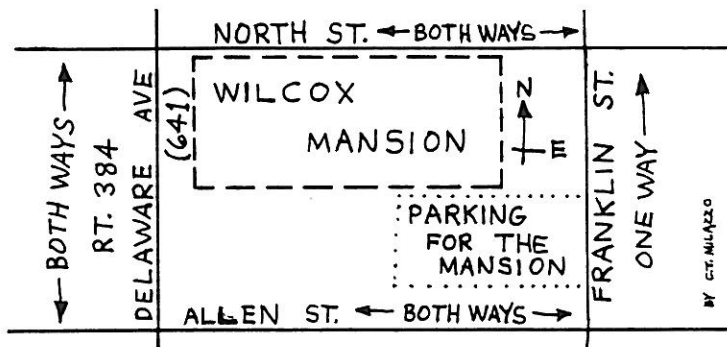
IS FLAG-DAY, JUNE 14TH

**\*! SPECIAL NOTICE !\***

### [ : MEETINGS MEETINGS : ]

**MAY MEETING-** This will be a DINNER MEETING. This year our regular May 10th meeting will be transformed into a dinner party at the Wilcox Mansion, featuring a sumptuous buffet provided by Triston & Debbie Dilapo. Things get underway around 6:30 that Friday evening with a little drink and so warm conversation prior to dinner, and then following, com the highlight of the evening our guest speaker Ernst Both who will provide an entertaining look at the history of astronomy with his topic, "Astronomical Foibles."

If you have not already made a reservation or purchased a ticket to the dinner, fear not as you will be able to get one at the door that evening. Dr. John Raymonda will be very happy to receive your \$ 8.00 then....



**JUNE MEETING-** This is our Annual Business Meeting. It will be held at the Buffalo Museum of Science as past, beginning at 7:30 PM SHARP!! This year the major item on the June 14 (Flag Day) business meeting agenda will be the election of three (3) new Board of Director members - two at-large member terms expire this year and one was vacated by Carl Milazzo's move to become the Observatory Director at Beaver Meadow. The current list of nominees include incumbents Triston Dilapo and Al Kolodziejczak, also those who have been asked by the nominating committee and accepted are Edith Geiger, John Yerger and Darwin Christy. Further nominations can be made by giving them to Rowland Rupp over the phone or by mail before the June meeting. Rowland Rupp is our nominating committee and his phone and address are listed in the directory.

Our speaker for the evening will be Darwin Christy who will give an account on the "Beginning of Light Pollution up to the ~~present~~."

\* \* \* \* \*

### N.F.C.A.A.A. MEETING

The annual Spring Meeting of the Niagara Frontier Council of Amateur Astronomical Associations will be held at Buffalo State College, 1400 Elmwood Ave. on Saturday, May 11th. There will be a charge of \$ 5.50 to cover our expenses.

Registration will begin at 1:00 PM EDST in the Science Building.

The Business Meeting will start at 2:00 PM. We will update the speakers list, hear reports of club activities and discuss various topics brought up by the delegates. We will then enjoy short papers put on by the various volunteer speakers.

After the Business Meeting there will be a buffet lunch put on by the restaurant workers class of the college. If you feel willing and able to help us at this lunch, we will be happy to have you.

Ed Lindberg

\* \* \* \* \*

P.S. WE NEED SPEAKERS FOR THE NFCAA - dc.....

\* \* \* \* \*



## \* \* NEW MEMBERS \* \*

### WELCOME:--

Nancy Fleming & Howard I. Nadjari  
Brian Fallon  
James & Cheryl Nelson  
Paul R. Noye  
Calvin K. Crego  
Thomas Milley  
William Halbert  
Nelson Pinochet

## \*\* OBSERVATIONS \*\*

On the evening of March 20th a nice grouping of planets were seen with the highlight being the elusive Mercury 6° below Venus, both in Pisces. 15 degrees west of Venus was first magnitude Mars near the brightest stars of Aries. Later that night with Tristan Dilapo's 18" Dobsonian and a 13mm Nagler, we observed from Beaver Meadows the following objects: One was a big fish that got away from Messier, a 9th magnitude galaxy in Leo and 11' x 5' in size which is as good as M-66. We could see two broad spiral arms extending from NGC 2903's bright nucleus that resembled M-81 in many ways. A yellow meteor of -2 magnitude was seen near Capella in Auriga, traveling 25 degrees towards the northwest. It's duration was 1.5 seconds and was spotted at 01:46 AM.

The next evening a -6 magnitude meteor was seen, as being blue and starting out in Leo traveling 50 degrees across Cancer and ending in Canis Minor. It produced 3 bursts that lit up the ground at 11:57 PM from Wilson, N.Y. which all took place in 2 seconds. As bright as it was, it left no glowing train at all.

From our club's observatory at Beaver Meadow on April 7th a yellow, zero magnitude meteor was seen for 1.5 seconds at 10:53 PM. It traveled 20 degrees across Gemini heading southward.

Carl Milazzo

1) March 8-9 I observed seven faint galaxies located upon the field of the X-Ray variable AN Ursa Majoris. These galaxies range from magnitude 13.2 to 14.8 but their brightnesses can be accurately estimated with respect to the variable stars comparison stars. Amazingly even the faintest of these galaxies was brighter than the X-Ray variable.

2) March 10-11 several more faint galaxies upon still another variable star field was observed. The faintest of these galaxies was estimated to be of only magnitude 15.0 and subtended only 1' x 1' arc minutes, practically a nebulous star. In comparison the visual limit terminated with magnitude 15.6 stars. This last small group of galaxies brings my total number of observed deep-sky objects to 2546.

3) March 15-16 a superb night out at Beaver Meadow Observatory. Tonight the spiral structure of galaxy M-101 was very obvious indeed. Seen at 86x the most prominent spiral arm issues from the eastern quadrant of the nucleus and curves clockwise through north for some 200° of position-angle. Also noted imbedded in the galaxy's nebulous whorls were five condensations or knots, these being NGC's 5450, 5451, 5455, 5461 and 5462. Perhaps even more interesting, the 12.5" reflector was without doubt penetrating down to magnitude 16.2 tonight!

Michael Idem

## INSTRUMENT SECTION

Our section has dropped off to a pretty low level of activity for this reason. We have not been able to hold telescope making classes as there does not seem to be much interest in this craft. And we have lost the craft shop at the museum. As our group is based on telescope making and related problems we need new T/M's. Our section can help anyone making a telescope by himself. It is a little unhandy to work in a meeting room but we have been doing it. Bring in your unfinished projects and miscellaneous problems. They

would be of mutual interest.

Last month Bob Schneider brought in a 4 1/4" reflecting telescope that he had bought at an auction. We tested the mirror and found it to have a good quality spherical figure. We tested the mirror without removing it from the tube. We just supported the telescope on its tripod and pointed it at the testing apparatus. This was the first time we tried this particular caper. It is possible since a mirror is tested its center of curvature and this is located way out in front of the tube. An important advantage of the method is that the tube acts as an excellent light shield for the testing procedure.

Ed Lindberg

\* \* \* \* \*

## BEAVER MEADOWS REPORT

Public Nights with our club's 12 inch telescope at Beaver Meadow have been changed to every clear Sunday. They will run from 9 PM to 11 PM, May through July and 8 PM to 11 PM, August through April.

This change will now make the observatory available to our club members on the only night of the week that most of them are able to stay up late. Most members work the first shift and are tired from working all week to stay up late Fridays to observe, and during the week it is even more difficult. To get members to volunteer to do Public Nights on Friday would be difficult with so many activities already scheduled that day of the week. They are the following: the main club meeting, study section, instrument section, star parties, mall shows and exhibits and helping Ernst Both on the Science Museum's roof on its Public Nights. In the past, Saturday Public Nights conflicted with the Beaver Meadow Nature Festival and weekly Summer Star Parties. Sunday Public Nights are a success at the Mees Observatory where the public drive for over an hour to get there.

The more members that volunteer to do Public Nights, the less work for everyone, and the many Monday Holidays make it easier. Presently 10 members have volunteered, if 18 members help out, that means only 3 times a year for each volunteer. Many of our club members are volunteering for the good of the club, and not because they are attracted to the present condition of Beaver Meadow Observatory.

After 9 years of the existence of the observatory, there still remains some major common problems that need to be corrected. Such as dew forming on the secondary diagonal flat mirror. Also ice forming on the rails which prevents the roof from being rolled back and this winter Halley's Comet will be here.

20 years ago when our club built the 12 inch telescope which is now located at Beaver Meadow, no member had a scope which was larger. Now 17 of our members have scopes which are larger, some of which are much larger. This is one of the main reasons why most of them find Beaver Meadow not as attractive now. Most of them over the years have done more than their fair share for the club and it would be a great loss for the club's sake if they were to leave. The best features of our club's 12 inch is its fine tracking ability which is ideal for photography and is good for visual observing up to a medium level. Many others have been discouraged from using Beaver Meadow because two or three kinds of serious astronomy is being done, and those doing it are very reluctant to stop. This is understandable and our club should encourage both serious and casual astronomy at Beaver Meadow. No one telescope design can do every thing, but three or four additional telescopes, each being of a different type can compliment the 12 inch. Some of the members have suggested a 6 or 8 inch rich field (RFT), also a solar filter would be a good addition to the observatory. Others have suggested a large Dobsonian of 18 or 29 inches or even larger, any of which could be stored if necessary in the crawl space under the observatory. Today at least 9 amateur groups have a telescope larger than 29 inches, both portable and/or permanent; the largest being 40 inches. When the Beaver Meadow Observatory first opened there were 10 to 20 members on clear moonless nights there. This continued for about 6 months, waiting in line, many planning to do photography before giving up going there. With complimentary

telescopes, this situation is less likely to repeat itself in the future.

The following are additions to the last observatory report. A vacuum cleaner was donated by Al Kolodziejczak, and the 12 inch mirror was aluminized by Miro Catipovic at no charge. Additional helpers to the roof rail support are Al Kolodziejczak, Carl Milazzo, Allan Mohn and Gretchen Schork. In the adding of cork to the tube of the 12 inch telescope,

The adding of cork to the tube of the 12 inch telescope, Doris Koestler, Al Kolodziejczak, Carl Milazzo and Gene Witkowski receive credit.

In April 1985 a fire extinguisher was purchased for the observatory since running water is not available in it. A coffee maker was also donated by Tom Reid which makes hot water for any type of hot drink.

Carl Milazzo, Director

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### PRESIDENT'S CORNER

I would like to urge all of our members, their friends and relatives too, to attend our May 10th combination dinner meeting at the Wilcox Mansion. I would like to see this event become an annual occasion, which means our first attempt must be a success, and everyone's participation is needed. Of course, those with good excuses will be forgiven for not attending, but if you don't, remember to bring a note from your doctor or undertaker explaining your absence.

We will be electing three new Board of Director members at the June business meeting so be sure to take notice of those who will be nominated and give them all your serious consideration before making your selections. Rowland Rupp is the man in charge of nominations so see or contact him if you would like to run for the Board or would like to nominate another.

Remember to volunteer your services to assist with Public Nights at our Beaver Meadow Observatory. Contact Carl Milazzo, and don't forget Carl has changed the day from Saturday to Sunday for Public Night Observations. I'm not so sure this change to Sunday is a good idea, but let's all give it a try and see what happens.

A brief note of thanks for all those persons who assisted with the Eastern Hills Mall Show this past April 5th & 6th.

Don't forget that star parties will be held again this summer, so be sure to plan several in your summer activity schedule. Times and places will be in the next 'SPECTRUM'.

Ken Biggie

\*\*\*\*\*

### \* THE SPECTRUM \*

BUFFALO ASTRONOMICAL ASSOCIATION, INC.

DARWIN CHRISTY, EDITOR  
216 KOHLER ST.  
TONAWANDA, N. Y. 14150

FIRST CLASS  
MAIL

### HALLEY'S COMET PHOTOGRAPHED

I succeeded in photographing periodic Comet Halley 1982T. Employing a 33 cm telescope, three time exposures were made these occurring on January 29-30, January 30-31 and February 3-4. The first exposure was somewhat trailed but the second and third show reasonably dense images of guestimate magnitude 16.5. A nebular filter was used for each exposure in order to secure a dark sky background. Enlarged 50x on the print, Comet Halley already appears slightly diffuse in outline. At present this famous comet can be found in the northwestern portion of Orion.

Michael Idem

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Thank you for the articles I have received thus far. I certainly appreciate them as they are what makes the "SPECTRUM" come to life. I have already mentioned some of the articles to be seen in future issues, although they may not appear in this issue, they will be seen. In the up and coming newsletters will appear such articles as, 'a variable star report'; "The Smyths"; "Bob Mayer"; "Aomori Meteorite Fall"; articles on Halley's Comet; "Xi Ursa Majoris"; "My Bed was Two Boulders"; and there will be some puzzles thrown in. Please do not think that this will deter my asking for more articles----IT WILL NOT. I will need more for when these run out, the "SPECTRUM" will need feeding.....

I wish to acknowledge the following for the present issue..

Edith Geiger

Dr. Fred W. Price

Kenneth Biggie

Ed Lindberg

Rowland Rupp

Claudia Bielski

Bill Smith

Carl Milazzo

Michael Idem

me.

Darwin Christy

\*\*\*\*\*

I almost forgot---- there will some door prizes to be given out at the May Dinner Meeting. One of them is a pair of dinners donated by Triston Dilapo to his "TNT COCOs". A couple of books also will be in the throws. This might help you decide that it is worth your while to attend the dinner and dinner meeting.....

The "SPECTRUM" Deadline for the JULY-AUGUST Issue is June 1- which is also our meeting as well as Flag Day.....

⑧



ROWLAND & IRENE RUPP  
132 BURROUGHS DR.  
SNYDER, NY 14226