THE ECLIPTIC

JOURNAL OF THE LACKAWANNA ASTRONOMICAL SOCIETY
KJC Observatory, Fleetville, Pa. Everhart Museum, Scranton, Pa.

Vol. 4 No. 1 VERNAL EQUINOX March 1976

COMET WEST

Look for Comet West in the East. Be sure to check out the pre-dawn skies during the first two or three weeks of March. For an ephemeris, check with the February and March issues of "Astronomy" or "Sky and Telescope." If the comet turns out as good as we all hope, it should be an easy naked-eye object for part of the time.

SUGGESTIONS FROM THE JUNIOR VICE PRESIDENT

While I am junior vice president, I have three goals that I would like to have to be put into effect as soon as possible. First I would like to form a planet patrol where the junior members come in and report observations they have made of the planets through telescopes and naked eye. The second is that I would like to have separate meetings with the junior members, to talk about observations and things like that. Have the junior members come in at 7:00 p.m. to have our meeting. Then have the regular meeting at 7:30 p.m. The third is that on LAS night at the Observatory, providing it's clear, to have the junior members come up, bring their telescopes and have observing sessions. These are the only goals that I have at the moment, but anything in the future that comes up I will try to take care of.

At the next meeting, I'd like to hear from the junior members in particular, about their opinions of my goals.

Robert Nicolais

SMOKING AND SEEING

Alfred Monkowski, M.D.

Editor's Note: This eye opener of an article originally appeared under the same title in the September, 1974, issue of Cluster magazine. We got it from the November 1975 issue of L.V.A.A.S.'s magazine, "The Observor."

All of us have stood beneath the stars looking up at a hazy patch, hoping our telescope was a bit larger. We have looked at M1, trying to see the lacy filaments or at M51 straining to see the hint of a spiral arm with a 6", remembering the clear night when a bit more detail was visible and the nebulous object appeared more beautiful.

The desire to see more causes larger telescopes to appear and more frequent trips to the dark mountains to be made in order to grasp as many photos as the clear haze-free sky will allow to enter into our telescopes and then into our eyes. But little thought is given to maximizing the human physiological potential in order to see more. More importantly, little is done to stop impairing seeing ability.

The photons that strike our retina's are only as useful as the retina's ability to respond to the incoming light. Color sensitivity decreases and black and white perception increases as we go from the retina's center to the periphery. We all use averted vision when we utilize the more sensitive peripheral retina, but let me address myself to what can decrease the sensitivity of the retina over all of its area.

It is easy to demonstrate that blood vessels are caused to constrict by various chemicals. If a nude person stands in a room at a temperature of 75°F., his skin temperature will equilibrate at about 92°F. (internal body temperature body temperature 98.6°F. ± 1°F.) All areas of the skin will be within 1°F. as noted by infrared photography. After smoking one cigarette, the hands and feet darken on infrared photographs, and the skin temperature over these areas is lowered by 6° to 10°F. compared to before smoking one cigarette. CONSIDER THIS EFFECT ON POTENTIATING THE LIKLIHOOD OF FROSTBITE OR SIMPLY DISCOMFORT ON A COLD WINTER NIGHT.

More sophisticated techniques have been used to measure the decrease in caliber of the retinal arteries in response to smoking one cigarette. The decrease is significant and results in raising the threshold of light perception. Consequently, if all else is equal, the nonsmoker will see dimmer objects and details compared to a smoking companion. Nicotine is responsible for this! The effect of nicotine starts within minutes of the smoke inhalation and lasts for about four hours. The nicotine is absorbed through the lungs and the moist mucous membranes of the mouth and throat, so those who do not inhale still experience the decrease in seeing ability. Therefore, two well-placed cigarettes can diminish your dark adaption for an entire night. Aviators have long been advised not to smoke until after night flights for the above reasons.

No permanent diminution of dark adaption has been demonstrated to date, though in heavy smokers (2 packs per day) a 24 hour period of abstinence may be necessary for return to full dark adaptability.

ASTROPHOTOGRAPHY PART IV

Here we go into the transition to what I call true astrophotography, because now instead of using just camera lenses we switch to the camera/telescope combination with usually a motor driven equitorial mount.

The easiest and sometimes very difficult object in astrophotography, the moon is where my hobby had its start. Although it took me a long time to master it. This is possibly because I did not have anywhere to obtain any astrophotography material to read at that time. There the moon was in the sky and I wanted to record its image. The road I took was long and hard. I didn't do my own film processing then, so it became quite expensive. Now I know that with the great books on astrophotography that the amateur has at his disposal to read, he can pick up this form of photography after a little effort. I still will say again that the book "Photography with the Telescope" obtainable through Edmund Scientific Co. is indespensible to the person just starting out. I still use it many times even now for its great photographic tables and mathamatical formulas.

In my examples I will be referring to a 6 inch reflecting telescope, 48" focal length, working at f8. With this telescope the image of the moon at prime focus fits the frame of a 35 mm camera with room to spare, but with ample size for some detail. I am not saying that other telescopes cannot be used -- the reason for using the 6 inch as my example is to have some standardization in this article.

Prime focus photos are taken with the camera lens removed, and a telescope adapter that was purchased to fit your camera attached to the camera, then fitted in the telescope focusing tube. Now the

Now the only thing bad about this is that most reflectors have to have their mirror moved forward in the tube a bit to reach prime focus. While this can be easily accomplished by elongating the the original holes in the tube to form slits so the mirror can be slid forward, remember that the telescopes mirror will have to be aligned each time this is done.

In most astrophotography books you can derive a common rule of thumb. For a bright sun light object, take the film's ASA and make it a fraction of speed by placing 1 over it. Example - ASA 125 becomes 1/125 second and the f/value will be f16. Now the full moon is this sun light object, and the moon at its quarter phases are four times dimmer. The f/value scale forms something like this: f/ 4 5.6 8 11 16 22 32. Each number before the number in question is 2 times faster or one stop faster; each number following it is ½ as fast as the one before it or 1 stop slower. Example, sa, the moon is first quarter -- that means it is four times dimmer or two stops dimmer, requiring more exposure than the full moon. Our telescope is working at prime focus which corresponds to f8 (6" f8 reflecting). Our film has an ASA of 125. For the <u>full</u> moon, our exposure is 1/125 second at f16, so being that our telescope is f8, the set up is already four times brighter (two stops) than needed for the full moon. To give the proper exposure for the quarter moon would have to be four times that needed for the full moon, so 1/125 second at prime focus would be correct for the quarter moon.

Since you're working at f8, say we wanted to shoot the full moon. We couldn't very well do it at 1/125 second and get proper exposure without changing the telescopes f/ratio (very difficult). Luckily on the camera there is a range of shutter speeds of 1/15, 1/30, 1/60, 1/125, 1/500, 1/1000 second. Here again we see that the shutter speed before each other is two times slower so giving two times more exposure, and each following is two times faster for 1/2 as much exposure.

Going back to our example, we are at f8 and want to expose for the full moon which would expose properly at 1/125 second at f16. Since f8 is four times faster than f16, you would have to speed up the time of exposure by a factor of four so just increase the shutter speed on the camera to 1/500 second. 1/500 second at f 8 is equal to 1/125 second at f 16.

Even when using this type of formula or others, it should be made clear that you should bracket your exposures by shooting one right on what you calculated, one slower, and one faster, to get the best possible exposure because exposures vary a lot because of sky conditions, temperature, etc.

Next time we will look at other systems to use to take photos that will let you control magnification.

James Filipski

HISTORICAL NOTES ON ASTRONOMY
Part III

Claudius Ptolemaeus, (Ptolemy) flourished about 139-161 B.C. A celebrated Egyptian astronomer and geographer, he held supreme sway over the minds of almost all of the scientific men from his own time down until about the fifteenth century. In astronomy he seems to have been, not so much an independent investigator, as a corrector and improver of the work of his predecessors.

Ptolemy's theories were accepted by the rulers of many nations, as well as the the Christian church, so no astronomer dared refute them. (Judeaism did not become involved; they had their God of Israel, who would not allow any god before him, thus astronomy and astrology were taboo.) He had "checked" Eratosthanes figures on the circumference of the earth, found them in error, and made the earth much smaller with his estimate. Columbus, using Ptolomy's

figures, set out to find a short route to India and was at first certain he'd reached it. Oh well! He wanted to discover America anyway. It took over 1500 years to prove that Ptolemy's theories were "sheer nonsense."

Nicholas Copernicus, 1473-1543, a Polish astronomer, revolutionized astronomy by showing that the earth moves around the sun instead of it being the center of the universe, as Ptolomy had written. His theory was not new. Nicetas of Syracuse, Aristarchus of Greece, Pythagoras, and some others had advanced this theory, but none of these men could offer concrete proof. Copernicus could prove this theory, but could not understand why the earth was in an inclined orbit, always pointing to the Pole star. This remained a flaw in his theory. He used Ptolemy's figures and failed to calculate the orbits of the planets by using ellipses. Instead he used circles on circles -- the deferents and epicycles that Ptolemy had used -- which resulted in an even more awkward description than in Ptolemy's system. This was the other major flaw in his theory.

Merton Ruth

ASTRONOMICAL GLOSSARY
from Prof. S. A. Yagain, B. S. S.

Dog star - Lassie

Light year - year of unemployment

Absolute zero - something a student tries not to get and scientists keep trying to achieve

Big bang - telescope hitting astronomer's head

Steady State Theory - theory that states if astronomer stays all night at his telescope without moving, he may be asleep

Geophysic - something the earth takes when not feeling well

Cassini's Division - Group of World War II astronomers

A. U. - spoken loudly to get someone's attention

Occultation - proper werd for occupation of ghost writers

MR. KNOW-IT-ALL RETURNS!

Q. What is Hubble's Constant?

A. The universe is expanding, with the more distant galaxies moving away from us at a greater velocity than the closer galaxies. The increase in velocity with distance was first calculated by E. E. Hubble and therefore known as Hubble's Constant.

Q. What is absolute magnitude?

A. Absolute magnitude is the actual brightness of a star if it was exactly 10 parsecs away. (A parsec is equal to 3.26 light years.) The sun's absolute magnitude is 4.86, very average. Of all the stars visible to the naked eye, Rigel is the most luminous. Its absolute magnitude is -5.8, 20,000 times as luminous as the sun. One of the least luminous has an absolute magnitude of 19.2 or only two milltionths as bright as the sun.

Q. I somestimes see the Andromeda Nebulae referred to as the Andromeda Galaxy. What is it, nebulae or galaxy?

A. It is a galaxy, much like our own Milky Way Galaxy. Until about 50 years ago, it was thought to be a nebula and within the confines of the Milky Way Galaxy. It is actually larger than the Milky Way Galaxy and about 2.3 million light years away, the farthest object we can see with the naked eye.

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A PRACTICAL GUIDE TO ASTRONOMY BOOKS

Today there are many books that the amateur can choose from dealing with astronomy, but unfortunately most of the widely advertized are not of practical application to the amateur. I am, of course, talking about the theoritical textbooks and descriptive analogies on quasars and blackholes so readily available at any bookstore.

The practical handbooks and atlases that the amateur seeks are the most important for within their pages are found established procedures, reliable advice on methods, and modes of observations. Since I've been asked often for advice on observing and where to secure more information, I have decided to put together a list of the books I've found to be most useful. Of course you will not find all of these on the local bookstore shelves, but you can order them and more from either Herbert A. Luft, 69-11 229th St., Oakland Gardens, N. Y. 11364 (supplies a list),or Optica B/C, Astro. Div., 4100 MacArther Blvd., Oakland, California 94619. (Publications and A.V.A. - 50¢)

List I Recommended for the beginner along with the advanced.

Norton Star Atlas and Reference Handbook
A Field Guide to the Stars and Planets - Donald Menzel
Field Book of the Skies - William Olcott
The Amateur Astronomer and His Telescope - Gunter D. Roth
Amateur Astronomer's Handbook - J. B. Sidwick (great if you can secure a copy
Observational Astronomy for Amateurs - J. B. Sidwick
The Amateur Astronomer Handbook - James Muriden
Handbook for Planet Observers - G. Roth
Celestial Handbook - R. Burnham Jr.
Messiers Nebulae and Star Clusters - Jones
Astronomy - A Handbook - Roth

List II For more complete description and information.

The Variable Star Observer's Handbook - J. S. Glasby
Visual Observing of Double Stars - Worley
Lunar Atlas - Alter
The Sun - Abetti
The Sun in H-Alpha Light With a Spectrohelioscope - Vei
Planet Jupiter - Peek
Planet Saturn - d'Alexander
The Planet Uranus - d'Alexander
The Planet Mercury - W. Sandner

Standard Handbook for Telescope Making - Howard
Telescopes- How to Make Them and Use Them
Amateur Telescope Making - Books One, Two and Three

John Sabia

Editor's Note: Please send any articles, news items or any other materials for publication in the Summer Solstice edition by May 5, 1976. Send them to: Jo-Ann Pluciennik
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