

DETROIT ASTRONOMICAL SOCIETY

Volume 4 No.7

Newsletter

NOVEMBER 1967

9900 EAST JEFFERSON

DETROIT, MICHIGAN 48214

Talk at U.of D. "LANDMARKS IN THE SKY"

Sunday Meeting NOVEMBER 12

The word Astronomy means 'the naming of the stars', It also is the name of the oldest of the sciences, Long before the dawn of recorded history man was noting the patterns and order of the firmament, He recognized that the stars were grouped in certain patterns, to which he gave names and which he wove into his legends,

Even today, in the space age, when we may plot the course of a space ship to a distant planet with complicated computers, we still use points of reference whose names may go back to the stone age, There is romance and fascinating history in the naming of the stars and constellations. There is also, for the individual, a sense of being an integral part of the universe and the history of mankind when he can find his way among the landmarks of the night sky,

In the past year, members of the D.A.S. Speakers Bureau have traveled over 1800 miles to talk to more than 2000 students on this facet of astronomy. C. D. 'Doc' Marshall, Chairman of the Speakers Bureau, and Dick Lloyd, one of the Bureau members, will be at the University, Sunday, Nov. 12, to tell the story to you and your friends,

Plan to attend and hear some of the interesting sidelights of the history of Astronomy ---- about some of the changes in the not so constant constellations -- -- about the French Astronomer who located more than a hundred landmarks, the majority of which can be seen with the most modest of telescopes, or even a pair of binoculars ---- and more

University of Detroit Science Building (facing Livernois) at 3:15 p.m. on Sunday, November 12. No admission charge - Free Parking, Bring your friends

ANNUAL MINERAL SHOW

On the week-end of October 28-29 the D.A.S. participated in the Gem and Mineral Show at the Light Guard Armory on East 8 Mile Rd. This is the third year that our Society has had an exhibit at this event, which is sponsored by the Michigan Mineralogical Society,

This show attracts hobbyists in the fields of rock collecting and polishing, gem cutting, geology, paleontology and archeology. Many of these also have an interest in astronomy, This was evidenced by the number who visited our exhibit to ask questions, peer through the telescopes and watch a mirror being ground on the barrel. We should also like to mention that quite a few of our present members and telescope makers first learned about the D.A.S. at the Gem and Mineral Shows of 1965 and 1966.

To visit and observe all the displays required at least three hours, and they were all so interesting that one hesitated to by-pass any of them, They ranged the spectrum from dinosaur horns and Indian artifacts to exquisitely cut rubies and carved and polished jade, One could also pick up quite an education on the geology, minerals and fossils of the North American Continent and the physics of crystal formation. The beauty of some of the polished stones and petrified wood were breathtaking,

It takes quite a few dedicated people to staff an exhibit at such a show, and a vote of THANKS from the D.A.S. and the Mineralogical Society goes to 'Doc' Marshall, Speakers Bureau & Special Events Chairman, and his crew:

Larry Applebaum, Elaine Berg, David Blake, Maureen Cam, Dexter and Bob Combs, Kim Dyer, Chris Edsall, John Hartleib, Larry Kalinowski, John Lang, Nels and Erik Lewis, Frank Lipke, Richard, Linda and Mary Lloyd, Phil Loboeki, David Maurer, Joe and Dee Melucci, and Daniel Murray.

They all did a wonderful job as salesmen for amateur astronomy in general and the D.A.S. in particular,

November Program of Events at Sylvia Allen Center

Friday, November 3, 1967

8:30 p.m. - Beginner's Class
'The Nature of the Universe'
(Discoveries since 1609) .

Friday, November 10, 1967

8:30 p.m. - Beginner's Class
Birth and Death of Stars
9:00 p.m. - Movie 'The Early Days'
(History of Aviation from the Wright
Brothers to the Space Age)

Sunday, November 12, 1967

Monthly Meeting at U of D (article on page 1)

Friday, November 17, 1967

8:30 p.m. - Junior Section Meeting Joel
Goldstick, Chairman
9:00 p.m. - Talk 'Astronomical Potpourri'
Speaker: Ernest Kossow

Friday, November 24, 1967

8:30 p.m. - Movie
9.15 p.m. - Astrophotography
'Photographing the Moon'

Friday, December 1, 1967

8:30 p.m. - Movie
9.15 p.m. - Beginner's Class
'Comets and Meteors'
Speaker: Ernest Kossow

We wish to welcome

for the Month of OCTOBER . . .

. . . a member of years gone by, Paul S. Davis has returned to Detroit, looked up the Society, attended the October Sunday Meeting and again placed his name on the membership roll. Welcome home, we're glad you're back.

A N.W. neighborhood paper (Home Gazette) had an article about the D.A.S. which caught the attention of Mr. and Mrs. Ronald K. DeLeary. David and Wendell attend Burns Elementary School - the Science teachers there (Miss Fletcher and Miss Andre) will be pleased to know they have two earnest amateur astronomers who will soon build a 6 inch Newtonian telescope for some serious observing. Welcome to the D.A.S. Family roll call.

Neil Gravenstreter and Charles Morris are neighbors in Southfield who share their astronomical interest, Charles became a D.A.S. member first (saw S & T listing of Societies) --he's been occupied with a regular observing program for some time (see his article 'Solar Activities') and is now building a 6 inch Newtonian. Neil has quite a collection of 'scopes, a 2 inch refractor and two reflectors (a 44 and a 10 inch). We look forward to more observing articles, Welcome,

Tony Lloyd is a student at Pierce Junior High School and was introduced to the D.A.S. by 'old' member John Hayes, Tony has a 2 inch refractor and is now grinding a 6 inch reflector, the better to see on his observing program, More about this later! (No, he is not related to the D.A.S. Treasurer.)

Daniel Murray 'phoned Charles Johnson for some information about telescopes and learned of the

D.A.S. meetings. In less than a month he is not only a 'new member' starting an 8 inch Newtonian, but also a 'veteran astronomy sales - man' helping staff the Society exhibit at the Light Guard Armory (see Mineralogical article).

WELCOME EACH AND ALL

SOLAR ACTIVITIES

by Charles Morris

Since the 28th of January of this year I have made regular sunspot observations with my 2.4 inch Tasco refractor. I use the projection method of observing to plot the positions of the sunspots and my 6mm eyepiece to pick out finer detail on the projection screen.

There have been two outstanding sunspot groups this year. The first one came around the limb on February 22. The lead spot had a diameter of 29,900 miles. There were as many as 20 sunspots in this group.

The second group, however, was much more active. On May 23 it produced a rare white light solar flare. In this group I counted as many as 27 sunspots,

The largest number of sunspots I have observed has been 53 which occurred on July 30 and 31.

One word can be said for October: **RAIN**. There have been a few small groups on the northern part of the sun that have been visible through the overcast. On October 19 I observed a collection of spots which may develop into a major group. It would be a good idea to keep a close watch of this area.

. . . from Larry Kalinowski:

The tentative date is December 10 for the presentation of Junior Certificates.

JUNIOR SECTION

As promised, here is my article.

Newsletters from the Ursa Major Astronomical Society (Junior section of the Lehigh Valley Amateur Astronomical Society) and also from the Junior section of the Chicago Astronomical Society will be in the Library.

Down at the Sylvia Allen Center for the past few weeks, John Hayes and I have been trying to start an observing program for our Junior section. We have held several un-scheduled meetings with little success in generating interest.

We wish to compile a booklet that will aid Messier Object seekers of the future in finding these objects. Al so what to expect when found.

Anyone interested in taking part, please come to the meeting scheduled for this month (see the Calendar of Events). If you can't attend, 'phone me . . . GA 7-0067.

Joel Goldstick

CONVENTION PAPER

In Frank Lipke's report of the Regional Convention in the September Newsletter, he mentioned a paper presented by D.A.S. member Mark Christensen. Mark, a Junior at Wayne University remarked that his paper covered quite a few pages. With those good people in mind who were unable to attend the Indianapolis meeting, we will not edit this work, but present it in installments. (Work was done on a GE 235 time-sharing computer)

AN APPLICATION OF COMPUTERS TO ELEMENTARY OPTICS

by Mark John Christensen

The purpose of this paper is to point out one of the most elementary uses of a computer. Computers are often misunderstood as to their limitations and potentials. In essence a computer is an adding machine with an ordered memory and a program which tells it what to do and when to do it. On top of all this, the modern electronic computer has high speed on its side.

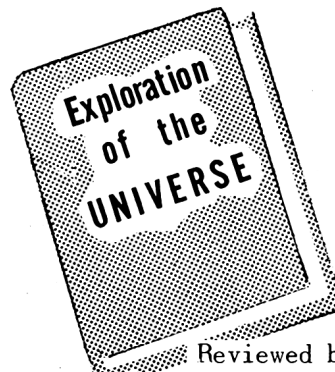
Obviously these attributes make the computer a natural for certain tasks, in particular those tasks easy in theory but tedious in performance. Problems of this type often arise in kinematics and electronics. Another set of problems that possibly could be attacked with computers are those involving very large numbers of particles acting under the laws of dynam-

cont. on page 6

The BOOK CORNER

This column will not be concerned with literary style or skill but will look at books from the standpoint of interest to our members.

If you know of a particularly good book you think should be included, call Doc Marshall at 393-6631 days or 535-7117 evenings.



Reviewed by C. D. 'Doc' Marshall

EXPLORATION OF THE UNIVERSE by George Abell
590 pages. Published in 1964 by Holt, Rinehart and Winston,

(Available in the Society Library)

The book is really a text for a one or two semester survey course in astronomy for the general college student. However, it is not written in the purely stilted descriptive style frequently encountered in science texts. Instead, it flows smoothly and easily and presents itself in colorful language.

Interesting early chapters outline the history of astronomy in China, India, Mesopotamia and Egypt. It then traces the course of astronomical development from the Greeks of 600 BC through the middle age European astronomers,

It covers just about every aspect of the science. Naturally, this limits the amount of material on any one subject to a short section. However, it is surprising how well each of the subjects is covered even in abbreviated fashion,

A large number of well done photographs, charts, drawings, etc., illustrate the text. The mathematics are limited to the very elemental principles of algebra and geometry. A person who has even a foggy memory of his high school math can easily follow this interesting work. And - if you have completely forgotten your math - a section of the appendix contains the simple formulae which will bring it back to you.

Interested in a bargain book on Basic Optics?
See article on Page 4



Ken Burgess

Signal '66

RADIO OBSERVATIONS OF THE 1966 SOLAR ECLIPSE

Part II

by Kenneth Burgess

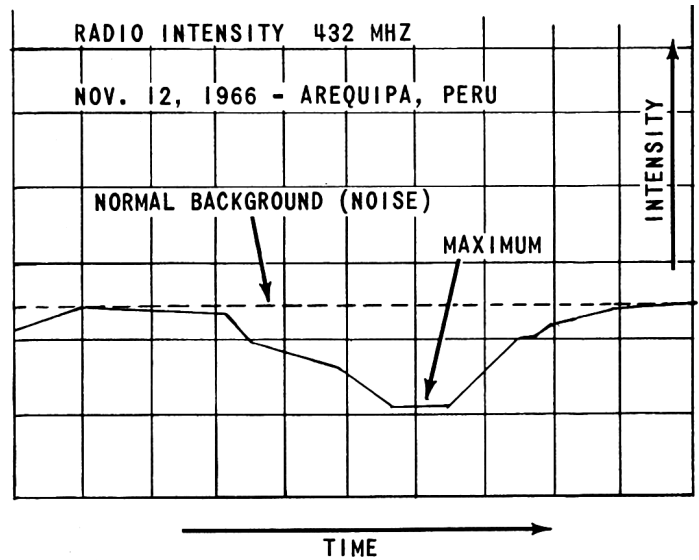
The article in the August '67 issue of the Newsletter briefly described my equipment and plans for monitoring the radio emissions of the 1966 Solar Eclipse. In this article I'm going to describe some of the results I obtained, but first a little background information,

In physics we often use the term 'mono-chromatic light' (single color) in reference to light of one particular frequency or wavelength, a very narrow section of the total spectrum, In radio astronomy any specific radio frequency is to the radio spectrum what monochromatic light is to the spectrum of light, It follows then that a 'monochromatic' radio measurement applies to what happens on that frequency only. This is the type of measurement that I undertook at a frequency of 432 megahertz,

The chart gives the basic results of the experiment, It may be interpreted in several ways because of one variable which was not measured ..this being the effects of the volume and density of the corona, Possibly the abrupt changes in the intensity can be attributed to the differences in the density of the emitting portion of the corona or they might be due to the position of the rays of the corona (when the corona is collapsed in a case such as this the space between the rays does not contain substantial quantities of coronal material and therefore does not emit nearly as much energy). There are many ideas that I have not yet fully considered, for example, the possibility that sunspot activity might have affected emissions so as to cause brief spikes or jumps in the level of intensity,

These and other things have yet to be investigated. One may theorize infinitely on one isolated measurement of this type, however, when it is matched against observational material gathered in other fields during the same eclipse it often proves to be most important in analyzing the total phenomena. Since my project was only one of many done for

the National Science Foundation, it is only after it has been used as one of the tools in the total evaluation that I will definitely know how important it is in discovering some of the secrets of our star, the Sun.



Optics

OPTICALMAN 3 & 2, NAVPERS 10205
Published by the U.S. Government Printing
Office - \$2.75.

This is quite a mouthful for this excellent technical manual. For those of us interested in astronomy in general and telescopes in particular, I would consider it a must,

It is primarily intended for Navy personnel who are studying to attain the rank of Opticalman third class or second class,

For our purposes we could look at it as being divided into two parts, The first part deals with basic optics, the second has to do with construction and maintenance of the various optical instruments used by the Navy, It is, the first section, Chapters two through seven, that are of particular interest to us, Well illustrated with photographs and drawings, mathematics is held to an absolute minimum, This would be a fine addition to one's library for either the novice or experienced telescope maker, (I intend to use this manual for the course in basic optics for the Mak-sutov Group.)

Here is a partial list of the table of contents: Optical Glass; Characteristics of Light; Images and Mirrors; Lenses and Prisms; and Basic Optical Instruments.

We are going to order copies on the basis of a prepaid order, If you want a copy of this manual see me, Larry Applebaum, Friday nights at Sylvia Allen, or send a money order or check, payable to me, for \$2.75 to 19171 McIntyre, Detroit, Mich. 48219. The absolute deadline will be Friday, November 17, 1967.

Eclipse Report



"Vi" Love

'The Unscientific Side of the South American Eclipse'

Chapter V E-Day November 12, 1966 (continued)

by V. E. 'Vi' Love

About 7:00 a.m. a group of young people approached the site, They were very cooperative and took up positions on the rim above us, built a fire and tuned their transistor radios to a program of snappy, South American music. Later, a bus stopped and driver and passengers emerged to watch us and the eclipse. The young people were students with their professor from St. Augustin College in Arequipa.

After first contact a hush fell over the crowd, broken only by the blare of the radios. Each one of our group was intent on his specific project. As we slowly approached second contact the crowd grew noisier. Finally, Newell Saigeon implored Sr. Garcia to ask the students to cut the volume on their radios. A man on horseback, silhouetted against the sky, was visibly puzzled by all of the activity.

Harvey Johnson was so engrossed in his measurement recording that he forgot the technique of sitting on a 3-legged stool (manufactured by Denslow and Co.).

Jim Dominy's movie camera stuck, but was soon operating again after a good slap by Jim.

I ran out of film in my movie 'camera during totality, but managed to get a few feet with Venus shining brightly below the eclipsed sun.

After the eclipse, the students examined the various instruments and all wanted their pictures taken with the equipment and Martha

Lloyd. Evidently the people of Peru are accustomed to U.S. projects being abandoned after scientific data has been recorded. When everything was being packed, the professor asked Edgar (Sr. Garcia interpreting) for any equipment that could be given to his college. It seems their Astronomy department is sadly lacking in material things. He was quite disappointed when informed that all equipment was owned by the individual members and not expendable.

The Jinx was broken! This was my third eclipse and the first one that was visible. On Oct. 2, 1959, Edgar and I spent the night in the cold and mist atop Mt. Wachusett in Massachusetts. The sun was to rise, already partially eclipsed. Fog and rain prevented anyone but airplane passengers from seeing it. In July, 1963, the D.A.S. sent an expedition to Senneterre in upper Quebec, about 50 miles S.E. of James Bay and 400 miles north of Toronto. The site was specially chosen because it was on the path of totality and records showed an absence of rainfall at that time of year. After battling black flies for two days of rehearsal, eclipse time drew near and the sun was blotted out by clouds and a heavy rain fell during totality. Again we saw nothing. The Johnsons and Lloyds had made this trip to Canada, so Lee and Martha magnanimously shared my feeling that the women must be jinxes on eclipse expeditions, When we left Arequipa on E-day, the three of us were much perturbed to see clouds on the eastern horizon. Fortunately, they drifted away and the sky was beautifully clear when the sun rose.

The eclipse was a great success. Newell Saigeon did a remarkable job as timer. In spite of no rehearsal, the projects progressed rather well. El Misti's beauty was breathtaking as the dawn light faded, turning this perfectly shaped volcano an eerie mauve color gradually fading into the deep grey of totality. The temperature dropped considerably. It was cold when we arrived at the site, but frigid during the eclipse.

An eclipse is an awesome sight but, in my opinion, it is most spectacular when viewed by means of color transparencies projected on a screen. It is possible to capture details such as the 'diamond ring', Baily's beads, prominences and the colorful inner corona by varying the exposure when photographing through a tele-scope, This was quite evident in Tom Waimeo's transparencies which varied from 1/60 sec. to 1/1000 sec.

Any projects involving totality had to be accomplished in the space of 70 seconds. The average maximum time of an eclipse (on exact center at midpoint of total path) from first contact to fourth, is two hours. The duration of totality, from second to third contact, varies widely. In Arequipa we were off the center line a few miles and had 1 minute 12 seconds of totality. In 1985 there will be 12 seconds, in 1973, 7minutes 12 seconds.

As soon as the eclipse was over, the equipment was repacked, the site cleared and we returned jubilantly to the hotel 35 miles away.

...continued on page 6

1966 Eclipse Report

..cont. from page 5

Regretfully, we left Sr. Garcia and Arequipa at 2:40 and arrived in Lima at 4:45 p.m.

It may be of interest to some readers to learn that all data has been evaluated and is now being com-

piled for presentation to the National Science Foundation and to the Inter-national Coordinating Commission for the Eclipse, as well as the D.A.S.

(Next Month: Chapter VI - Lima Revisited)

CONVENTION PAPER

cont. from page 3

ics, That is, stars and galaxies, I do not know if this has been done, but it seems possible that a star could be described as a system of N particles. Surely a human could not handle the many necessary equations, but a very high capacity, high speed computer could.

Still another set of problems in which a computer is a natural are optical problems. References in S & T are common which tell how a worker used a computer to design an optical element. A computer is a natural because, no matter how physically complicated an optical system becomes it is essentially little more mathematically complicated than Snell's law. Thus, highly complicated optical systems can be analyzed very quickly by a computer equipped with a ray-tracing program and information concerning the elements of the system, The process used here involves shooting a ray of light (a mathematical line, ignoring diffraction) INTO THE SYSTEM and observing its behaviour at the image plane. The problem with which we here concern ourselves yields nicely to such

an investigation. It is in the realm of elementary optics that the problem with which this paper concerns itself is found. The problem is: At what distance from a spherical mirror is the image of the smallest diameter formed? For a parabolic mirror the answer is $R/2$, where R is the radius of curvature. For a spherical mirror, however, this is not true, Geometry tells us that the smallest image will occur a distance $R/2 - \frac{0.0465a^2}{R}$ from the mirror. Here

a is the diameter of the mirror and R is again the radius of curvature.

In this paper I shall attempt to find this expression using a computer and a non-geometric (Visually speaking) approach. That is, the expression $R/2 - \frac{0.0465a^2}{R}$ was found half by looking at

drawings and half by the methods of analytical geometry. What I wish to do is to remove the 'looking at drawings' half of the process and thereby make the whole business more mathematically satisfying. The method I chose was that of averaging.

(• • to be continued)

*Ed. Note: Snell's Law deals with the calculation of the refraction or bending of light by simple trigonometric means.

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