equal to the observer's latitude. Then when the mounting is set on a level base, the axis will be properly in line. The north and south alignment, however, is rather tricky. All sorts of methods are in use but there is one simple method which is quick and accurate. From a good star chart or table pick two or three stars which have exactly the same declination and are at least 30 degrees apart in right ascension. Set the mounting level and then train the guide telescope on one of the three chosen stars so that it is exactly behind the cross-hairs of the eyepiece. Now swing the telescope around with the driving gears to each of the other two chosen stars. If the mounting is lined up properly, both these stars will pass behind the cross-hairs. If they do not, shift the mounting slightly to the east or west, and check all three stars again. You may have to do this several times before all three stars will track right through the cross-hairs, but the whole operation should not take more than ten minutes.

Smaller sizes of cut film, such as $3\frac{1}{4}$ x $4\frac{1}{4}$ inches, are large enough for most work. Panchromatic film is preferred in order to show up the red stars in proper intensity. Panchromatic films must however be developed in total darkness. The usual darkroom red light will fog a "pan" film quickly. In some cases a special dark green lamp may be used for momentary inspection of the negative while being developed.

—Kenneth Shepherd, Secretary, Forsyth Astronomical Society, 703 W. E. Blvd., Winston-Salem, N.C.

Editor's Note: Mr. Shepherd will send plans for the mounting above described upon request.

NEW MEMBERS

Dinbergs, Anatol 3708 Albemarle St., N.W.(16) OR 6920
Feldmans, Jules 4704 17th St., N.W. RA 9334
Johnston, Ned 2214 Washington Ave., Silver Spring, Maryland. SH 3139

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Jewell Boling, Editor, 1717 P Street, N. W. (6) DU 2969

STAR DUST
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JANUARY CALENDAR

Jan. 14 Sat. "THE CENTER OF GALAXY EXPEDITION," by Dr. Bart J. Bok, 8:15 p. m. Commerce Auditorium.

Jan. 21 Sat. Discussion Group. 8:00 p. m. Commerce Foyer.

Every clear Wednesday night, open house Naval Observatory, 8 till 11 p. m.

Every Friday night, 7-10 p. m. Telescope making class, Roosevelt High School, 13th and Upshur, N. W. Room 313. Miss Irene Warthen, instructor. Telephone SH 9451.

"THE CENTER OF GALAXY EXPEDITION." There is a great exploration in the making, far beyond the limits of human travel, an adventure into the central region of the great expanse of stars that we see spread out in the sky as the Milky Way. It is probing of what can be called the very hub or center of the universe in which we live, our own private universe or galaxy.

Dr. Bart J. Bok, our speaker for Saturday, January 14, will be one of the explorers on this expedition. He has been associated with Harvard College Observatory since 1929 and is now an associate director of the Observatory. Dr. Bok will leave sometime in February for the Harvard Observatory South Africa station in the Orange Free State, where he will stay until September 1951, helping with the observing program. This station is located at a latitude of thirty degrees south, where the region of the center of our galaxy passes directly

overhead on every night of the most favorable season for observing.

Dr. Bok will cover some of the background material relating to the center of our galaxy and disclose some of his research plans for the expedition.

—Abraham Robinson, Publicity Chairman

DISCUSSION GROUP. Due to the very low attendance, the Technical Discussion Groups have been discontinued. The one for December was canceled. However, because of requests from many sources it has been decided to renew the discussion groups along the lines of the last two years. There will be a discussion group meeting on Saturday, January 21. It will be held in the foyer of the Department of Commerce Auditorium. The program will be announced at the meeting January 14.

—Bob Wright, President

MR. ALTON P. HALL DESIGNS EMBLEM FOR NCA. The design for this emblem consists of the words "NATIONAL CAPITAL ASTRONOMERS" in triangle arrangement on a base consisting of one equilateral triangle superimposed upon another to form a six-point star, generally known as Solomon's Seal. A central circular figure depicts a heavenly body or planet. Within the six points of the star are small stars, all with blacked-out backgrounds, indicating the sky. The design lends itself well to reduction in size in that the parts to be printed and those to be left light are equal. The basic design is in cyclic balance and the entire design is symmetrical in organization. The design might be done in silver, black and white, blue and gold, or other colors.

Among the applications to which the emblem could be put are pins, stationery, and Christmas cards. The design could be sawed out of plywood or made in relief from plaster of Paris and painted.

HINTS ON CELESTIAL PHOTOGRAPHY

One of the most fascinating ventures in amateur astronomy is celestial photography. All the amateur really has to know is how the stars rise and set and how to develop a piece of cut film.

You do not need an expensive outlay of cameras or lenses. Almost any sort of simple lens (except the concave varieties) in a home-made box camera may turn out surprisingly good negatives. I once secured three or four magnifying glasses from a 5 and 10 cent store and rigged them in corrugated cardboard cameras equipped for $3\frac{1}{4}$ x $5\frac{1}{2}$ plates. All four lenses did well, and one was exceptional. Curvature and bad definition may be largely remedied by using lenses with focal lengths at least three times the diameters of the lenses. Achromatic lenses are free, of course, from both defects.

In all celestial photographs (except those of the sun and moon) the exposure time will be long. An equatorial type mounting is necessary to track the stars accurately while the picture is being made. I have had very good success with a 4-inch camera and guide telescope on a home-built equatorial mounting. The guide telescope is a 2-inch achromatic, equipped with a 12x eyepiece with cross-hairs. The camera and telescope are lined up on the same star and the entire assembly is made to follow the star as it sets by means of a gear apparatus. Clockwork may also be used to drive the gear assembly. It is, in fact, more often used than not. However it is likely to give a beginner trouble in adjusting for exact tracking speed. The simple hand-controlled gear assembly is easy to construct, simple to operate, and absurdly economical, costing less than a dollar for all necessary parts. The equatorial mounting must be accurately lined up north and south and the equatorial axis must be adjusted parallel to the earth's axis. The latter condition may be easily satisfied by constructing and mounting so that the equatorial axis is inclined at an angle