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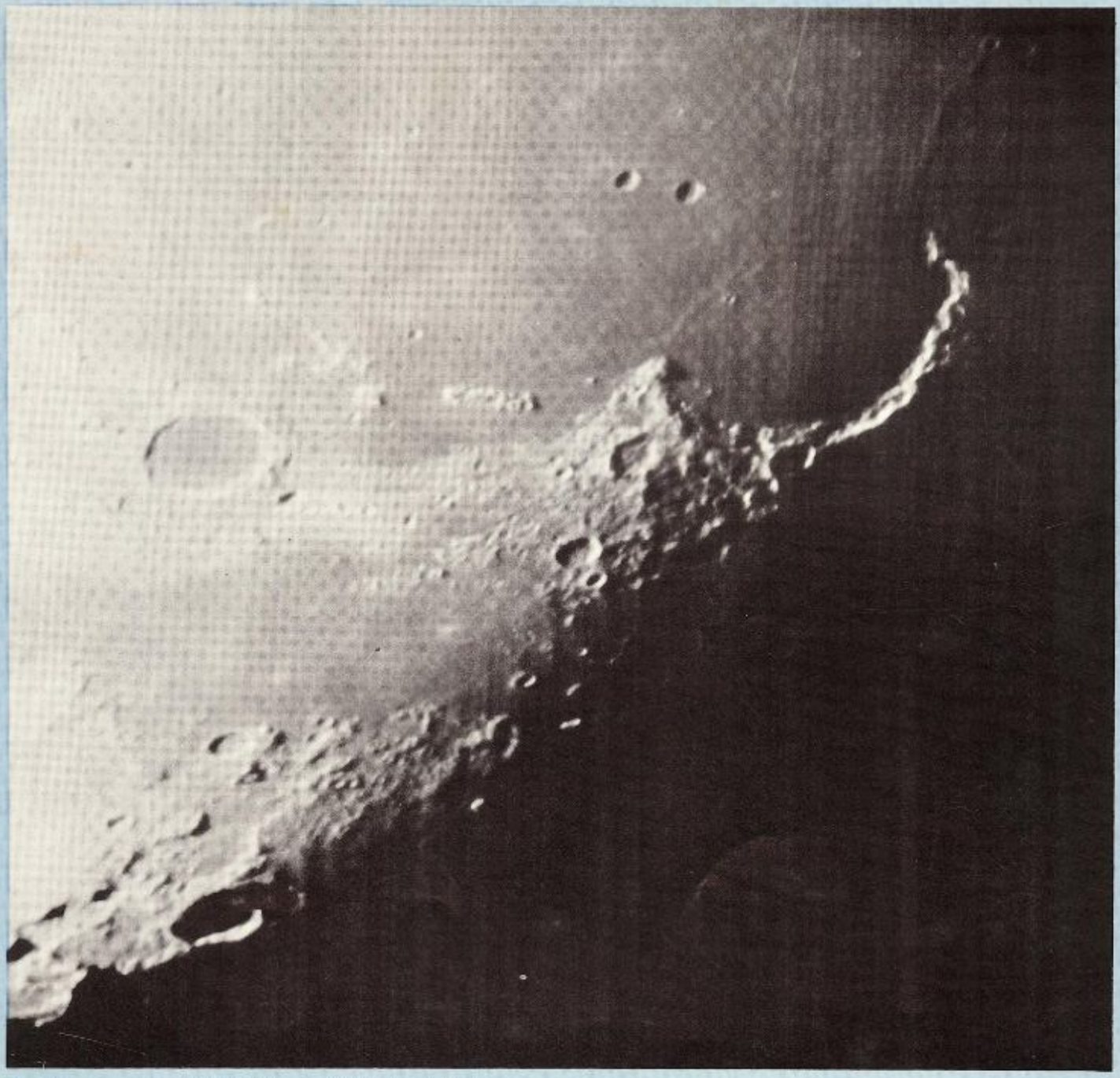

This Moon photo, by G.A.T. Heillegger of Schiedam, Holland, contains several interesting features. Mare Imbrium dominates the upper (south) portion of the photo.

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COVER PHOTO: This section of the moon is dominated by Mare Imbrium. Below it is Sinus Iridum and the crater Plato. Just below Plato is Mare Frigoris. The photo, by G.A.T. Heillegger of Schiedam, Holland, was taken with an 8", f/8 Newtonian and eyepiece projection to f/40, on Panatomic-x film exposed for 2 seconds, at 20h 10min. U.T. May 11, 1973. The film was developed in Diafine (two-bath developer) for 2 x 3 minutes at 20 degrees C.

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EDITOR'S NOTE

Despite my optimism last issue we are again late in getting out. We are endeavoring now to get the Oct.-Dec. 1973 issue out by the first of October, but no promises. We will be installing a new typesetting machine which may cause some delays, but I doubt it. At any rate the improved quality provided by this machine will be worth it I'm sure.

I'd like to welcome two more people to our staff. David Roth, of Paramount, California, has become Column Editor for Amateur Societies. We would appreciate it if all societies now sending us their newsletter would also send a copy to David Roth at 8114 Golden Avenue, Paramount, CA 90723. Also, a new A.P.S. (Astronomy Press Syndicate) column, Space Exploration, by Geoffrey Falworth, has been started in this issue. Mr. Falworth writes regularly for Hermes (Britain's popular astronomy magazine). Space Exploration will review recent events in space programs around the world.

A new national amateur astronomy organization has been formed recently called The American Astronomical Research Group, Inc. (A.A.R.G.). Their main goals are to establish a major observatory for astronomical research and to create a data retrieval system for use by both amateur and professional astronomers. A.A.R.G.'s projects are funded through individual and corporate memberships. The Questar Corporation became the first sustaining corporate member and recently the Celestial Observer has become the first contributing corporate member. As a member the CO has offered to publish A.A.R.G.'s newsletter. Starting with the Oct.-Dec. 1973 issue all subscribers will receive A.A.R.G.'s newsletter along with the CO. This newsletter will keep you informed of what A.A.R.G. is doing and plans to do in the future. For more information refer to their ad in this issue.

We're always looking for articles and photographs, so if you've got an idea or a project, write it up and send it to us. If you belong to an astronomy club we would appreciate receiving your newsletter.

I'd like to thank all our readers for their support and especially those who have written to us. Your ideas and suggestions are always welcomed.

Editor

A Simple Design For Building Large Reflectors

By John Dobson

I have come to understand that our methods are unusual in many respects. This is not through any effort on my part to be unusual, but simply to find an easier, quicker, cheaper and if possible, more satisfactory ways to do these jobs so that a very great many more people may have the opportunity to look through these larger telescopes.

We usually grind porthole glass instead of Pyrex blanks because they can be had from salvage outfits at a much lower price. This allows us to start with much larger glass, 10½, 12 and 16 inches though many still prefer to grind 8½ inch (still portholes) to keep the final telescope small enough to be passenger car portable. What may be described as our standard model is a 10½ or 12 inch, on it's own wheels, which is stationwagon portable and which I shall try briefly to describe.

We usually use sub-sized tools and pitch laps nowadays, 12 inches are ground and polished on 10½" tools, 10½ inches on 8½ inch tools. The rough grinding is done with the mirror on top to generate the curve; the fine grinding and polishing are done with the tool on top. We usually position the lower glass on a patio bench or the like with furring nails to keep it from sliding around, but allowing it to be turned easily. We do not walk around a barrel.

In rough grinding we mostly keep the center of the mirror disc moving fore and aft about ½ way between the center and edge of the tool. Toward the end of the rough grinding we curtail the overhang. Three hours will rough grind a ten incher. We push them hard.

Fine grinding is done with the tool on the top with a little extra pressure on the edge that overhangs the edge of the mirror blank. Polishing is done in a similar way.

In pouring the lap we heat the tool in hot tap water, dry it, smear it with turpentine and pour the pitch on the center, stopping before it flows to the edge. Quickly we press it with the mirror face (smeared with cerium oxide and water) to sqeeze the pitch a little farther and shape it to curve, then quickly remove mirror and press grooves in the soft pitch with the cross bar of a wooden clothes hanger and again press to curve.

Polishing and figuring are done on a warm pitchlap. With the mirror in the telescope, the curve is read while trained at a power pole insulator in the sunlight. The bright spot of sunlight is thrown out of focus first one way then the other by pushing the eyepiece in and out. The two resulting discs of light should be the same. If they are not the mirror needs to be dug in those areas that bundle too much light when the eyepiece is too far out.

The telescope tube usually consists of cardboard-the tubes they make for pouring concrete pillars. In the lower end we mount four plywood blocks with furring nails driven in the forward end. The blocks center the mirror in the tube and the furring nails prevent it from rolling forward. The blocks serve also to position the tailgate of 3/4" plywood held in with screws through the cardboard wall. The three bolts for adjusting the position of the mirror are threaded directly through the plywood. A piece of cardboard is glued to the middle of the inside of the tailgate to position three masonite pieces over the ends of the bolts so that they do not touch the glass directly.

The spider mount at the forward end of the tube consists of a section of hand rail stock about 4 inches long cut 90° at one end and 45° at the other and with three longitudinal saw cuts about ½" deep to receive the ends of cedar roofing shingles to position it in the center of the tube.

The eyepiece tube is 1½" inside diameter heavy walled cardboard about 2" long glued down to a 3"x4" masonite piece with a 1½" hole in the center. It is slipped through a hole in the main tube so that the edges of the masonite can be glued to the inside wall of the main tube. The optics are lined up by first moving the shingle pieces against the inside of the main tube till a spot of black tape at the center of the main mirror is seen directly down the axis of the eyepiece tube. The objective bolts are adjusted until the black spot covers the reflection of the pupil of the eye centered in the eyepiece tube.

Around the main tube at the center of gravity a 3/4" plywood box is built on either of which are fastened two large round bearing surfaces such as grease seals, phonograph turntables, etc., which rest in notches in 3/4" plywood cradle boards, fastened to the inside walls of a three sided rocker box which turns around on three pieces of teflon on a ground board resting on three feet consisting simply of small expendable blocks of 3/4" plywood.

The rocker box and ground board should be made of solid core door material or plywood exceeding on inch in thickness. The axle for the wheels may be mounted on the front side of a two by four on the front of the rocker box so that the wheels are about 1½" off the ground.

This design is simple to make, easy to use, and has been used to build such telescopes as the San Francisco Sidewalk Astronomers's 24" (which won Best Optics at the Riverside ATM Conference several years ago).

Editor