



ON A CLEAR DAY

By Bill Larson

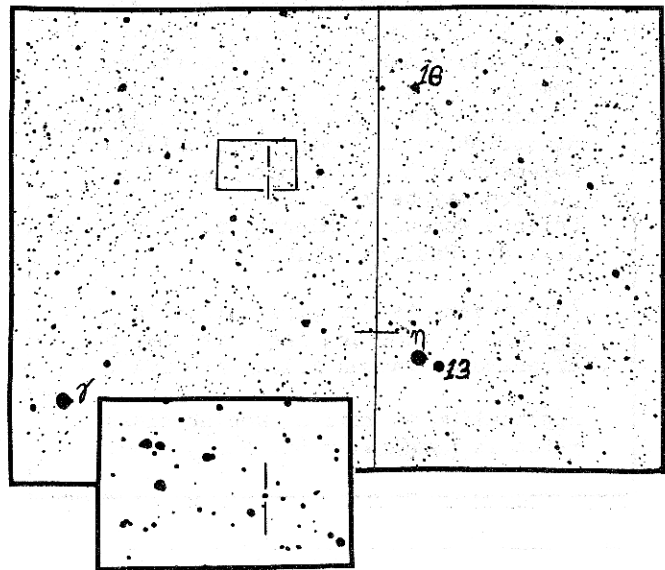
When I began observing deep-sky objects, I quickly learned not to expect to see them as they look in the photos taken at the major observatories. However, by understanding what I am observing, I am able to appreciate the infinite subtlety of the universe. I can witness the birth of stars in the Trifid Nebula or the death of a star in the Crab Nebula, or hundreds of billions of stars and perhaps hundreds of civilizations in the Andromeda Galaxy.

But for me, one of the most awesome aspects of the universe is its vastness. And so I have taken the time to contemplate upon the quasar 3C 273, the most distant object visible with an amateur telescope.

3C 273 is well placed for evening viewing in April or May. At magnitude 12.8, it is easily visible at high power with an 8-inch telescope. At R.A. 12hr 26.6m, Dec. 2° 19' 42", it is about 2° east and 1° south of 5th magnitude 16 Virginis.

3C 273, the brightest quasar in the sky and the first discovered, has a redshift of $z=0.158$, or 40,000 km/sec. Taking the currently accepted value of 50.3 km/sec/mpc for the Hubble constant, and assuming its recession is due to the expansion of the universe, this gives a distance of over 2.5 billion (2.5×10^9) light years (ly).

2.5×10^9 ly is vastly too great a distance to comprehend. Try thinking of it in terms of time. The photons that we see now began their journey only 0.5×10^9 years after the extremely primitive life form, blue-green algae, first appeared on Earth. Over 1 billion years after those photons left their fiery home, primitive organisms such



These charts show stars in Virgo to magnitude 13 with north up. 3C 273 is between the tick marks. The small chart is an enlargement of the $0.77^\circ \times 1.12^\circ$ rectangle on the larger $8.75^\circ \times 7^\circ$ chart. The chart is adopted from the "Photographic Star Atlas" by Hans Vehrenberg.--Photo by Lauren Nelson

as amoeba first came into existence on Earth. And by the time those archetypical prehistoric animals, the dinosaurs, appeared, the photons had only 10 per cent of their interminable voyage to complete. Now, try to imagine one of these almost ageless photons ending its lonely journey by impinging on your own retina. What a marvelously improbable finale!

Minutes

Regular meeting of March 1, 1977:

The meeting was held in the Members' Lounge of the Science Museum of Minnesota. Pat Clements, president, opened it at 7:30 p.m.

The secretary announced that registration forms are now available for the 31st annual

regional convention of the Astronomical League. This year the convention will be hosted by the Fox Valley Astronomical Society of St. Charles, Ill. The meeting will be held at Fermi National Accelerator Laboratories, Batavia, Ill. The speaker will be Dr. Timothy Toohig, head of the Meson Division at Fermilab. He will speak on the depths of matter of which the universe is made and of the exciting new discoveries and insights of the nucleus of the atom and their influence in our interpretation of the universe.

Schedule of events:

Friday evening, April 29--Open house at

GEMINI

Editor----Andrew Fraser

Gemini is issued monthly by the Twin City Astronomy Club (TCAC), an affiliate of the Science Museum of Minnesota, St. Paul, Minn.

The TCAC strives to promote amateur astronomy through its publications, meetings, and public programs. Membership is open to anyone. Annual regular member dues are \$16 and student member dues are \$5, of which \$1.50 is allocated for a subscription to Gemini. Subscription to Gemini is available to non-members at \$2.50 per year. Inquiries may be directed to: TCAC, Science Museum of Minnesota, 30 E. 10th St., St. Paul, MN 55101.

Advertisements for publication in Gemini are welcome and inquiries may be directed to Lauren Nelson c/o TCAC.

Application to mail at second-class rates is pending at St. Paul, Minn.

the observatory of Wheaton College, Wheaton, Ill. Observing with the 14" telescope. Naperville Astronomical Society will have open house at their observatory and observing with their 10" telescope at Naperville, Ill.

Saturday, April 30--The convention at Fermilab.

Please see Hub Brueckner or Jim Fox for registration forms.

Members John Cooner and Bob Schmidt showed slides they have taken of the asteroid Vesta. These slides, taken days apart, show the motion of the asteroid against the stellar background. They used an f4.5 230mm lens on Plus X film with a 2 minute exposure.

Laird Calia was the principal speaker of the evening. He presented an interesting program on observing the planet Jupiter. He detailed the procedure used in making drawings of Jupiter's cloud belts. He also spoke of the value these drawings have for professional astronomers. Please see Laird if you are interested in joining in this work, being done by him and other Association of Lunar and Planetary Observers (ALPO).--Submitted by Hub Brueckner, secretary

The next meeting of the Twin City Astronomy Club will be in the auditorium of the Science Museum of Minnesota at 7:30 p.m., April 5, 1977.

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