

inferior. The 10 000 ASA film 0.03-sec exposures show markedly better resolution than 0.5-sec exposures on conventional 50–100 ASA panchromatic film.

It was found possible to increase the speed of the 10 000 ASA film by a factor of 2 by heating the camera back to 115°F during exposure and development. It was further found that pre-exposure fogging of the film by skylight, during daytime telescopic photography of the moon, increases the 10 000 ASA film speed by a factor of 10. This technique is being refined for application to night time lunar photography which should make possible exposure times near the lunar terminator at half moon of the order of 0.001 sec at $f/60$. It is believed that with a 60-inch aperture and 300-ft focal length the theoretical resolution of 0.077 sec of arc should be achieved, yielding lunar surface detail resolution of the order of 500 ft.

Absorption Systems of Nova Herculis 1963.

DEAN B. McLAUGHLIN, *University of Michigan Observatory*.—Spectrograms on 32 nights, 9 February to 15 April, give a nearly complete record of the absorption spectrum. Absorptions were lacking after 20 April. Three systems are recognized; at times each was composite. The spectrum developed typically. Its general appearance and the velocities approximated those of Nova Geminorum 1912.

The principal system (Alpha Cygni type) was strong 9 February, but had lost most of its metallic lines by 23 February. A hydrogen component of lower displacement emerged 14 March and was dominant by 13 April.

The diffuse enhanced system (H , Ca II, Mg II, Fe II) was strong and double at hydrogen, but Fe II showed only the less-displaced component. Apparent fluctuations of position accompanied secondary light variations. This system was weak by 22 March, but traces remained until 15 April.

The Orion system (He I, N II, O II) was weak 9 February, strong by 18 February and strongest throughout March. Fluctuations of intensity and position were unexpectedly large, considering the small secondary light variations. From 9 to 21 February its velocities were midway between those

of the two diffuse enhanced components, but the Orion lines appeared single and too narrow to be blends of two lines with diffuse enhanced velocities. After 21 February their velocities were independent. The lines He I 4472 and a few others appeared double 14, 15, and 24 March. Changes in the $\lambda 4600$ region suggested blending of two sets with different displacements. Lines of N III were strong 5 to 15 April.

The table outlines velocity trends.

An Experiment in the Use of Polar Cap Absorptions to Predict Geomagnetic Storms. KENNETH MOE (introduced by E. W. Greenstadt), *Space Technology Laboratories, Inc.*—Until the time of the 1961 Kyoto Conference on Cosmic Rays and the Earth Storm, there appeared to be little hope of making reliable predictions of geomagnetic storms from observations of radio absorption in the polar regions; however, at the Kyoto Meeting, Hill (*J. Phys. Soc. Japan* 17, Suppl. A1, Part 1, 1962) reported detecting many hitherto undetected PCA's by analyzing ionosonde data. Hill's results encouraged the author to attempt quantitative "predictions" of A_p . An idealization of Jenkins and Paghis' (Defense Research Telecommunications Establishment, Ottawa, Canada, 1963, to be published) curve giving the response to major burst-PCA flares was used to predict the time history of A_p after the PCA's observed by Hill. The predictions were quite good for the large geomagnetic storms ($A_p > 50$), but not very good for the smaller storms. These conclusions were confirmed by studying the PCA data of Jelly and Collins (*Can. J. Phys.* 40, 706 1962).

It is suggested that the best way of observing polar cap absorption is by placing an ionosonde in an artificial satellite having an orbit of 90-deg inclination.

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Determination of Polarization Distributions over Radio Sources. D. MORRIS, V. RADHAKRISHNAN, AND G. A. SEIELSTAD, *California Institute of Technology*.—A method is described by which it is possible to study the distribution of polarization over the radio sources with a variable baseline interferometer. The results of preliminary measurements at the Caltech Radio Observatory of the distribution of linear polarization over eight strong radio sources are presented. At a wavelength of 10.6 cm the linearly polarized region in the Crab Nebula has a diameter considerably smaller than that of the unpolarized source. Both components of the central source in NGC 5128 are shown to be linearly polar-

Date, UT		Velocities (km/sec)				Orion
		Principal	Diffuse enhanced			
Feb.	9.4	—804		—1338	—1482	—1414
	21.4	—1017		—1540	—1672	—1607
Mar.	2.4	—1069		—1584	—1713	—1737
	23.4	—950	—1188	—1393	—1611	—1855
Apr.	5.3	—1028	—1269		—1527	—1888
	13.3	—1078			—1543	—2360