of Technology during the past winter. Kopal's method was used and the numerical computations were performed using electric desk calculators.

The table summarizes the results.

*Washburn Observatory,
Madison, Wis.,
Mass. Institute of Technology,
Cambridge, Mass.*

Kameny, Franklin E. Photoelectric photometry of Uranus and Neptune.

The object of this program was the detection, by means of a photoelectric photometer, of short-period fluctuations in solar brightness, if any exist. Use was made of the fact that the distance Sun-Neptune-earth is 3 light-hours longer than the distance Sun-Uranus-earth. Continuous tracings, interrupted for dark current, sky, and comparison-star readings, were taken on Uranus for 3 hours, followed by continuous tracings on Neptune. By comparing tracings, it was then possible to check for coordinated fluctuations of brightness in the two planets, and hence, in the sun.

No correlated fluctuations of periods several minutes to a half hour, and greater than 0.02 mag. were found. Possible fluctuations of the order of an hour or more at, or just below, the limits imposed by instrument and atmosphere may exist but need further observation.

*Harvard College Observatory,
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Keenan, Philip C. Temperature classification of the S-type stars.

The use of band intensities to arrange the S-type stars in a temperature sequence is suggested by these observed relations between spectra of types M and S:

(1) Stars can be found representing every step in the transition from pure type M (*TiO* strong, negligible *ZrO*), through various mixtures of the bands of the two molecules, to the extreme type S (*ZrO* strong, negligible *TiO*).

(2) *TiO* bands strengthen with diminishing temperature and form the criteria of classification within type M. A similar temperature dependence of the *ZrO* bands is indicated by their strengthening with decreasing light in long-period variables.

(3) The greatest strengths of bands of *ZrO* and *TiO* do not occur in the same stars. Bands of the two molecules seem to inhibit each other as

they would if a fixed amount of oxygen were being divided among the metals.

The proposed classification uses a weighted sum of the *ZrO* and *TiO* bands in assigning subclasses in the temperature sequence running from S₀ to S₉ or later.

In order to include a measure of the relative strength of *ZrO* to *TiO* (which was the basis of Miss Davis' provisional classification), the difference between the *ZrO* and *TiO* bands is used in assigning subscripts to the main types. Thus a cool star very strong in *ZrO* would be called S₇₈, while if *ZrO* were extremely weak the type would be S₇₀ = M₇.

Preliminary types for a few well-known stars follow:

HD 121447	S ₀
S UMa (Max)	S ₁₈
R Gem (Max)	S ₂₈
R Gem (Ft. Max)	S ₅₈
V679 Oph	S ₃₆
HR 1105	S ₄₃
R Cyg (Max)	S ₃₇
R Cyg (9 ^m 7)	S ₈₇
HD 177175	S ₅₂

The three stars R CMi, W Cas, and R Ori, which do not show bands of *ZrO* have generally been assigned to type S because of similarity in the strengths of some of the atomic lines. W. B. Bidelman at Yerkes and the author find strong infra-red bands of *CN* and several of the Swan bands of *C₂* in R CMi and W Cas. Since Vyssotsky had previously reported the blue *CN* bands as very strong in R Ori,¹ it appears that these three stars should be removed from type S and grouped with the red carbon stars.

1. Unpublished. Reported at Tonanzintla Symposium in 1942.

*Perkins Observatory,
Ohio Wesleyan University,
Delaware, Ohio.*

Kiepenheuer, K. O. Cosmic rays and radio astronomy.

It will be shown that the cosmic radiation in our galaxy is of sufficient power to explain the general galactic noise in the meter-wave band. It is now known that this galactic radio emission is not a thermal free-free radiation of interstellar gas, as was first believed, since the electronic temperature would then have to be of the order of 100,000°. All spectroscopic evidence leads to values around 10,000°. Stars could be considered as sources only under very artificial assumptions. The observed intensities, which have