for the solution of this difficult problem, although equally plausible arguments can be advanced in favor of all the existing hypotheses. Among these mention should be made both of the old hypothesis proposed by Olbers back in 1804, according to which the asteroids are fragments of a single planet broken up into parts under the influence of either internal or external forces, as well as the known theory of the origin of the solar system, developed by Academician O. Yu. Shmidt and his students, according to which the asteroids are fragments of primordial meteoritic matter, which various factors prevented from merging into a single mass and forming one of the large planets.

However, most astronomers support a hypothesis whereby the planetoids have been produced as a result of successive disintegrations of a few larger primordial bodies. This hypothesis was proposed by the American astronomer Kuiper in 1906 and was mathematically verified in a number of our papers.

It has been known for a long time that the distribution of the asteroids with respect to their diurnal motions has several minima and maxima, and various hypothesis have been proposed for their explanation. This property of the asteroid distribution is not possessed by other Kepler elements. This is probably due to the fact that the Kepler elements change in time by virtue of perturbations due to the attraction by the planets, especially Jupiter.

In our own investigations, we have refused to use the Kepler elements and decided to choose elements that are stable in a definite sense under constantly moving perturbations.

Using the theory of secular and long-theory perturbations, which is being developed in the Department of Celestial Mechanics and Gravimetry of the Moscow State University and is based on averaged variants of the limited three-point problem (Sun-Jupiter-asteroid), we have chosen the major semiaxes of the orbits, the angular momenta relative to the perpendicular to the plane of the orbit of Jupiter, and the constant of the Jacobi quais-integral. We have used also the rectangular coordinates of the central projections of the poles of the orbits of fragments on a plane tangent to the celestial sphere at the pole of the ecliptic, bearing in mind that these coordinates are connected with the invariant elements of Hiroyama.

In order to compile catalogs of the values of the indicated elements, we have carried out a detailed physical analysis, i.e., a study of the distribution of the asteroids with respect to elements that remain stable in time. It turned out that in all cases it is possible to subdivide all the asteroids into several groups. This revealed the interesting fact that the character of the empirical distributions, as well as all the revealed groups, remain constants, i.e., the presence of maxima and minima on the distribution curves is not the consequence of the lack of material, but represents an important distinguishing feature of the aggregate of asteroids, probably connected with their origin.

To explain the revealed singularities of the planetoid belt, we have carried out first a critical analysis of Olbers' hypothesis, i.e., that the planetoids were formed by disintegration of a single planet. It turns out that it is impossible to reconcile the empirical distribution of the planetoids with the disintegration of one planet.

We have then analyzed the hypothesis of consecutive disintegrations, assuming that the primordial large bodies move in the gravitational field of the sun and Jupiter. Three variants of the disintegration mechanism were analyzed, with different choices of the plane of motion of the primordial large bodies, and of directions and magnitudes of the relative velocities.

The analytic apparatus of celestial mechanics and probability methods make it possible to express the elements of the orbit of the fragments as functions of the elements of the orbit of the primordial large body, to determine the relative velocities (v) in terms of ecliptic coordinates (β, λ) and to obtain the distribution function of the fragments from these elements.

We have also obtained the distribution function of the system of quantities (a, e) and (Ω, i) and also $\tan i \cdot \sin \Omega$ and $\tan i \cdot \cos \Omega$.

The investigation of the distribution of the fragments of the primordial large bodies by orbit elements was supplemented by a comparison and investigation of the distribution of the fragments with respect to certain of the physical characteristics. We have chosen the mean (m_0) and proper (g) stellar magnitudes and as the investigated characteristics determined the distribution of the fragments with respect to their differences.

The form of the distribution curves of the fragments of the primary large bodies depends on the elements of the orbits of the primary large bodies, which have been calculated assuming that the asteroids making up the groups have a common origin.

It has been shown that the fragments obtained as a result of the successive disintegrations of the primordial large bodies move around the sun on elliptic orbits with different eccentricities, in different planes, in a ring between the orbits of Mars and Jupiter.

I. A. Aslanov, Z. A. Ismailov, N. B. Ibragimov, and S. M. Azimov, Some Results Obtained with the 2 Meter Telescope.

The investigation of the operation of the second telescope of the Shemakha Astronomical Observatory (ShAO) is already complete. The investigation of the receiving apparatus of the telescope is scheduled to be completed at the end of 1969. Let us list briefly the main technical data of the telescope.

The telescope operates in three optical systems:

1) In a primary focus f = 9 m, field $21' \times 21'$;

2) in Cassegrain focus f = 29.5 m, field $7' \times 7'$;

3) in a Coudé focus, f = 72 m, field $3' \times 3'$.

In the primary focus are located the following: a Cassette device for direct photographs and a diffraction spectrograph with dispersions 232, 137, 86, 79, 46, and 29 A/mm.

In the Cassegrain focus are contained the following: a cassette device for direct photography and two spectrographs—prism and diffraction, with dispersions: a) 90, 150, 180, 300 Å/mm at H and b) 10, 15, 25, 30, 37.5, and 75 Å/mm. In this focus there is also an electrophotometer.

In the Coudé focus there is a diffraction spectrograph with dispersions 4, 6, 8, 12, 16, and 24 Å/mm. Provision is made for installation of the spectroelectrophotometer.

The Hartmann constant for the principal mirror is 0.13, thus evidencing its good quality. At the present time two projects are being carried out with the telescope:

1. Investigation of magnetic stars.
2. Investigation of young nonstationary stars.

These two projects will continue to 1975. They have been considered and approved by the Council on the Coordination of the Operation of large Instruments of the Astronomic Council of the USSR Academy of Sciences.

These tasks will be carried out in collaboration with the German Academy of Sciences (East Germany), the principal astronomic observatory of the USSR Academy of Sciences, and the Astronomic Council of the USSR Academy of Sciences.

By now, approximately 800 observations have been carried out with the telescope both by our own staff members as well as by scientists of other soviet and foreign astronomic institutions.

The most important results, in our opinion, were obtained by the members of the ShAO of the Azerbaĭdzhan Academy of Sciences, namely:

Observation of planets. 1) Emission bands were observed on the night side of Venus, and were identified with CO_2, molecular nitrogen, N_2, and CN. These bands were previously observed by N. A. Kozyrev and identified as bands of N_2. 2) Absorption bands were observed in the Saturn ring, and are apparently due to water vapor. There are also several absorption bands whose identification is not yet complete.

Study of tight binary and other stars. The following were determined: a) the influence of the gas flow on the spectrum of the entire system; b) the influence of the possible physical variability of the component on the evolution of such systems; c) the presence of asymmetry of the contours of the hydrogen lines in the spectrum of RY Lac, obtained in the elongations.

Observations were made of novas in the constellations Delphinus and Vulpecula and the following was observed: a) second and third flashes of N Delphini; b) complex splitting of the lines, certain features of which were not previously noted; c) rapid variation of the ray velocities of the components; d) doubling of the absorption lines in the Velpicula nova.

The main results of the spectrophotometric investigation of magnetic and young nonstationary stars are as follows:

1) A rapid variation of the excess ultraviolet radiation and of the intensity of the emission lines 46686 He II, 4363 [OIII], and 4340 H were observed in the star AG Pegasi.

On one spectrogram, the hydrogen lines were split into two components of emission with absorption in the center, probably indicating that the star had an envelope at that instant.

It is interesting to note that six days prior to the observation of the envelope (20—26 October 1967), several emission components were observed in the hydrogen lines in the spectrum of AG Pegasi, with velocities from +530 to −600 km/sec.

2) As a result of the study of stars of the type T-Tauri, which started in before the installation of the 2-m telescope, motion of matter in the star RY Tauri was observed, with velocities exceeding 800 km/sec. Three stars were then investigated: RW Aurigae, RY Tauri, and CW Orionis. These investigations were continued with the 2-m telescope.

The results of the investigations, briefly, are as follows:

a) The previous conclusion that there is an inverse correlation between the changes of the brilliance and the intensity of the excess short-wave radiation was confirmed.

b) All the physical characteristics of the stars, which can be determined, vary in time, and these changes occur in random fashion.

c) Since 1964, an envelope has been produced in the star RW Aurigae; this envelope is sufficiently dense, with $n_e \approx 10^{10}$. Such a rapid formation of such an envelope indicates the presence of violent processes on the surface of the star.

d) These processes apparently continue even now, since the spectrograms obtained in 1969 reveal rapid changes of the contours, manifest in the vanishing of emission components in the hydrogen lines.

e) These data possibly confirm the recently advanced hypothesis that stars of the T-Tauri type presently undergo planet-formation processes.

The initiated investigations are continuing in the following directions:

1. In cooperation with other stellar telescopes of the observatory, and also with the colleagues from East Germany, comprehensive observations of nonstationary and magnetic stars are being carried out, namely simultaneous spectral, electrophotometric (in the UBV system, and subsequently in the color system), and polarometric observations.
2. Searches for new means and apparatus for high-accuracy measurement of the magnetic fields of stars.
3. Attempts to determine the evolution sequence of young non-stationary stars.
4. Development of a slitless quartz spectrograph for the primary focus, and its use for the investigation of weak nonstationary objects.

R. É. Guseĭnov. Dynamic Processes Leading to Generation of Coronal Formations.

At the present time the most likely mechanism for the generation of protuberances is assumed to be the mechanism of condensation of coronal gas by cooling via thermal conductivity and radiation, with allowance for the decrease of the thermal conductivity in a magnetic field.

We have studied this process comprehensively, applying the indicated mechanism to the generation of coronal formation, including coronal flares. On the basis of extensive observation material, obtained by many authors, we started from the following concepts:

1) The coronal flares and active protuberances are produced in coronal condensations. The process of generation of these formations is due to the flare-active groups of sun spots, the magnetic-field changes and motions of which serve as an external factor, and the instability of the condensation itself serves as an internal factor.