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Comets

During 1960–62 the following elements of comets have been published in the U.S.S.R.:
F. B. Khainina and O. N. Barteneva (**1**) completed the linking of four apparitions of the comet
P/Faye. K. I. Antishina calculated the elements of Comet 1931 IV Ryves from 23 observations
(1931 Aug. 14–Nov. 18) without perturbations (**2**). L. M. Belous obtained an improved
orbit of the Comet 1949 IV Bappu-Bok-Newkirk based on ten observations (1949 July 4–
1950 May 10) with perturbations by Jupiter and Saturn (**3**). S. G. Makover improved approxi-
mately the elements of Comet Neujmin III (1929 March–1951 April) according to the
observations in two apparitions. Perturbations by five planets (Venus to Saturn) in 1929–1951
and Jupiter and Saturn in 1951–1961 have been taken into account. The elements and
ephemeris for 1961 are given in (**4**).

Comet Observations

Observations of positions have been carried out at Alma-Ata, Ashkhabad, Pulkovo, Tartu,
and Zvenigorod; photometric observations at Alma-Ata, Ashkhabad, Dushanbe, and Kiev
(**5** to **11**).

Theoretical Work

I. W. Galibina investigated the original and future orbits of comets with eccentricity near
unity. Including her previous work, she investigated 48 original and future orbits. The
computations are based on a method proposed by Dr S. G. Makover, according to which the
true anomaly is taken as independent variable. The majority of original orbits have been found

to be elliptic, while only about half of the future orbits are elliptic, the others being hyperbolic (**15**).

H. I. Kazimircak-Polonskaya, continuing her work on the motion of comets in the vicinity of planets, investigated the possibility of an application of the method of numerical integration in special rectangular coordinates to the planetocentric motion of comets. She also worked out differential methods of small corrections for different factors, such as perturbations due to some inner planets and satellites, systematic effects of high order terms, etc. (**13, 14**).

F. H. Perlin (**12**) investigated the method of variation of arbitrary constants with the eccentric anomaly as independent variable. She derived exact formulas for the Lagrange and Herrick form of the equations. K. A. Steins published a series of papers dealing with problems of the capture theory of periodic comets and of the theory of diffusion of comets.

V. G. Fessenkov stated that the great Tungus meteorite fall might be the result of an encounter of the Earth with a small comet. He proved also that short-period comets probably originated from non-periodic comets as a result of single and multiple perturbations due to the major planets.

B. Ju. Levin suggested a hypothesis, that in icy cometary nuclei the stony substances are present in the form of separate atoms and molecules embedded in the amorphous, non-coherent condensate of different volatile substances (**16**).

L. S. Marochnik investigated the nature of the cometary head, and made an attempt to prove that heads of comets may be considered as composed of plasma with a high degree of ionization.

S. K. Vsekhsvyatsky published a Catalog of Absolute Magnitudes and Photometric Parameters of 62 Comets observed in 1954–60 (**18**).

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