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Abstract Book

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parameter of ~ 20 deg at 700 nm wavelength. Vesta's surface displays the largest albedo variations observed so far on asteroids, ranging from ~ 0.10 to ~ 0.76 in geometric albedo in the visible wavelengths. The phase function of Vesta displays obvious systematic variations with respect to wavelength, with steeper slopes within the 1- and 2-micron pyroxene bands, consistent with previous ground-based observations and laboratory measurement of HED meteorites showing deeper bands at higher phase angles. The relatively high albedo of Vesta suggests significant contribution of multiple scattering. The non-linear effect of multiple scattering and the possible systematic variations of phase function with albedo across the surface of Vesta may invalidate the traditional algorithm of applying photometric correction on airless planetary surfaces.

7799:Present State and Prospects for the Meteor Research in

Ukraine

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ODESSA. Systematical study of the meteor events are being carried out since 1953. In 2003 complete modernization of the observing technique was performed, and TV “meteor patrol” on the base of WATECLCL902 cameras was created. A wide variety of mounts and objectives are used: from Schmidt telescope $F = 540$ mm, $F/D = 2.25$ (field of view $FOV = (0.68 \times 0.51)$ deg, star limiting magnitude $SLM = 13.5$ mag, star astrometric accuracy 1-2 arcsec) up to Fisheye lenses $F = 8$ mm, $F/D = 3.5$ ($FOV = (36 \times 49)$ deg, $SLM = 7$ mag). The database of observations that was collected between 2003 and 2012 consists of 6176 registered meteor events. Observational programs on basis and non-basis observations in Odessa (Kryzhanovka station) and Zmeiny island are presented. Software suite of 12 programs was created for processing of meteor TV observations. It enables one to carry out the whole cycle of data processing: from image preprocessing up to orbital elements determination. Major meteor particles research directions: statistic, areas of streams, precise stream radiant, orbit elements, phenomena physics, flare appearance, wakes, afterglow, chemistry and density. KYIV. The group of meteor investigations has been functioning more than twenty years. The observations are carried out simultaneously from two points placed at the distance of 54 km. Super-isocon low light camera tubes are used with photo lens: $F = 50$ mm, $F/D = 1.5$ ($FOV = (23.5 \times 19.0)$ deg, $SLM = 9.5$ mag), or $F = 85$, $F/D = 1.5$ ($FOV = (13 \times 11)$ deg, $SLM = 11.5$ mag). Astrometry, photometry, calculation of meteor trajectory in Earth atmosphere and computation of heliocentric orbit are realized in developed “Falling Star” software. KHARKOV. Meteor radio-observations have begun in 1957. In 1972, the radiolocation system MARS designed for automatic meteor registration was recognized as being the most sensitive system in the world. With the help of this system 250 000 faint meteors (up to 12 mag) were registered between 1972 and 1978 (frequency 31.1 MHz, particle masses 10-3–10-6 g). Simultaneously, millions of reflections were registered for even fainter meteors (up to 14 mag). Information about 250 000 meteors and 5160 meteor streams is included in database. This is an unique material that can be used for hypotheses testing, as well as for creation new theories about meteor phenomena. Models of the meteor matter distribution in the Earth’s atmosphere, near-Earth space and in the Solar system, influence on surface of spacecrafts were developed. NIKOLAEV. The optical and radio observations of meteors have begun in 2011. Two WATECLCL902 cameras are used with photo lens $F = 85$ mm, $F/D = 1.8$ ($FOV = (3.2 \times 4.3)^\circ$, $SLM = 12$ mag, star astrometric accuracy 1-6 arcsec). Original software was developed for automatic on-line detection of meteor in video stream. During 2011 year 105 meteor events were registered (with angular length (0.5–4.5) deg and brightness (1–5) mag). Error of determination of the meteor trajectory arc $\pm(10-12)$ arcsec. Error of determination of the large circle pole of the meteor trajectory is $\pm(3-13)$ arcmin. In the radio band observations of meteors are performed by registration of signal reflected from the meteor wake. As a signal source the over-the-horizon FM station in Kielce (Poland) is used. Narrow-beam antenna, computer with TV/FM tuner and audio

recording software are used to perform radio observations. Original software was developed for automatic detection of meteor in audio stream.

6075:Spectrophotometric properties of Moon's and Mars' surfaces exploration by shadow mechanism.

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Typically, to analyse the data of the phase dependence of brightness atmosphereless celestial bodies one use some modification of the shadow mechanism involving the coherent mechanism. There are several modification of B.Hapke [2] model divided into two groups by the number of unknown parameters: the first one with 4 parameters [3,4] and the second one with up to 10 unknown parameters [1] providing a good agreement of observations and calculations in several wavelengths. However, they are complicated by analysing of the colorindex $C(\alpha)$ dependence and photometric contrast of details with phase $K(\alpha)$ and on the disk ($\mu_0 = \cos i$). We've got good agreement between observed and calculated values of $C(\alpha) = U(\alpha) - I(\alpha)$, $K(\alpha)$, $K(\mu_0)$ for Moon and Mars with a minimum number of unknown parameters [4]. We used an empirical dependence of single scattering albedo (ω) and particle semi-transparency ($\hat{\alpha}$): $\hat{\alpha} = (1 - \omega)n$. Assuming that $[\chi(0^\circ)/\chi(5^\circ)] = \chi(5^\circ)/\chi(0^\circ)$, where $\chi(\alpha)$ is scattering function, using the phase dependence of brightness and opposition effect in a single wavelength, we have defined ω , $\chi(\alpha)$, g (particle packing factor), and the first term expansion of $\chi(\alpha)$ in a series of Legendre polynomials x_1 . Good agreement between calculated and observed data of $C(\alpha) = U(\alpha) - I(\alpha)$ for the light and dark parts of the lunar surface and the integral disk reached at $n \approx 0,25, g = 0,4$ (porosity 0,91), $x_1 = -0,93, \omega = 0,137$ at $\lambda = 359\text{nm}$ and $0,394$ at $\lambda = 1064\text{nm}$; for Mars with $n \approx 0,25, g = 0,6$ (porosity 0,84), $x_1 \approx 0, \omega = 0,210$ at $\lambda = 359\text{nm}$ and $\omega = 0,784$ at $\lambda = 730\text{nm}$. 1. Bowell E., Hapke B., Domingue D., Lumme K., et al. Applications of photometric models to asteroids//Asteroids II. Tucson: Univ. Arizona Press. - 1989.-P.524-556. 2. Hapke B. A theoretical function for the lunar surface//J.Geophys.Res.-1963.-V.68,No15.-P.4571- 4586. 3. Irwine W.M., The shadowing effect in diffuse reflection//J.Geophys.Res.-1966.-V.71,No12.-P.2931-2937. 4. Morozhenko A.V., Yanovitskij E.G. An optical model of the Martian surface in the visible region of spectrum//Astronomy Reports.-1971.-V.48,No 4.-P.795-809.

6294:Strategy for NEO follow-up observations