

Solar System Bodies Of Low Albedo

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Many asteroids, planetary satellites, Centaur objects, Kuiper Disk objects, and comets, have surfaces with very low (0.02-0.1) reflectance (albedo). Most of these objects for which data have been obtained lack spectral features that are diagnostic of the surface composition, so their compositions have been inferred on the basis of reflectance trends with wavelength (colors), and comparison with meteorites. The principal surface darkening materials appear to be complex organic solids, elemental carbon in some form, and shocked minerals. The principal processes for the production of C and complex refractory organics are irradiation of surface ices and atmospheric gases by UV photons and particles from the Sun and the Galaxy. Impacts produce shock darkening of surface minerals in the process of regolith formation and surface gardening. A few key Solar System bodies show spectral features indicative of ices, organic solids, and minerals. The spectral evidence for these component, and their implications for the histories of several classes of objects will be reviewed. Some key issues directly related to bodies with low-albedo surfaces are: 1) the source(s) of the carbonaceous meteorites, including interplanetary dust particles and micrometeorites, 2) mixing in the asteroid belt, 3) dynamical scattering of the asteroids, 4) planetary satellites (and Pluto-Charon) as former Kuiper Disk objects, 5) processing of interstellar and solar nebula ices and organics to the state now observed in the Kuiper Disk, and on Centaurs and planetary satellites.