



## POLISH CONTRIBUTION TO THE DISCOVERY OF COSMICAL DUST CLOUDS

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### 1. Introduction

At the restricted three-body problem there are five specific positions in an orbital configuration – libration points – the points of relative equilibria. The triangular Lagrange libration points  $L_4$  and  $L_5$  lie at the third corners of the two equilateral triangles in the plane of orbit whose common base is the line between the centers of the two masses. These points are stable equilibria positions for some definitive ratio of the two large masses. This is the case for the Sun-Jupiter system, for the Sun-Earth system, for the Earth-Moon system and others. It is common to find at (or orbiting) the  $L_4$  and  $L_5$  points of natural orbital systems. They are commonly called “trojans” – asteroids discovered orbiting at the Sun-Jupiter  $L_4$  and  $L_5$  points were named after characters from Homer’s Iliad.

Such “Trojan satellites” for the Earth-Moon system were first reported by the Polish astronomer Kazimierz Kordylewski of Krakow Observatory. Director of the Krakow Observatory Professor Tadeusz Banachewicz in 1951 suggested him to use a telescope and photographic instruments for observation. Kordylewski was hoping for reasonably large bodies in the lunar orbit,  $60^\circ$  away from the Moon. But the search was negative! At that time Professor Józef Witkowski, specialist in the field of classical astronomy and celestial mechanics in Poland, suggested that there might be many tiny bodies too small to be seen individually but numerous enough to appear as a cloud of dust particles. In such a case, they would be best visible without a telescope, i.e., with the naked eye. Using a telescope would “magnify it out of existence”. Kordylewski was willing to try. A dark night with clear skies and with the Moon below the horizon was required. Since 1951 he had