

IAF SPACE EXPLORATION SYMPOSIUM (A3)
Virtual Presentations - IAF SPACE EXPLORATION SYMPOSIUM (VP)

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LUNAR-FLASHES

Abstract

ABSTRACT

A new program to observe lunar impact flashes has been started at the Sharjah Academy for Astronomy, Space Sciences Technology (SAASST). These observations will be carried out using a 14-inch reflector telescope having a resolution of 0.575 arc-second. The telescope will be monitoring the dark portion of the Moon to establish the rates and sizes of large meteoroids with masses higher than about a couple of tens of grams striking the lunar surface. The observations must be conducted during specific phases of the Moon, i.e., between New and First Quarter Moon and between Last Quarter and New Moon. The solar illumination must be less than 50 percent to yield possible detections. The telescope is fitted with an IOT4-VTIV3 GPS that records the accurate time when these flashes happen. Moreover, we will be using an f/3.3 f/6.3 focal reducers to enhance the image as it will increase the field of view. One of the best ways to observe these lunar impacts is to detect their IR emission, and for that, we chose the analog WATEC-902H CCD camera because of its super-high sensitivity near the IR and the red spectrum. This feature enables us to detect the IR signature of the impacts. In addition to that, the camera also has an SNR equal to 50 dB. Two software, the LunarScan, and SharCap will be used. LunarScan uses a differencing algorithm to search for groups of pixels that stand out above the background as determined by a specific, scalable threshold, whereas SharpCap has a wide range of features that makes it suitable for many types of astro-imaging including Planetary, Lunar, Solar, Deep Sky and EAA (Electronically Assisted Astronomy). This new program at SAASST will give us a good understanding of the meteoroid environment in space, in general, and around the Moon, in particular. Analysis of the flash luminosity can determine the mass of the impacting rock, and hence a size-distribution can be estimated. It is known that large meteoroids are less abundant than small ones. The Moon, representing a large collecting area, can be ideal to do a statistical analysis of these large stones.