The research project "Search for macroscopic dark matter by the ground-based and space-based high sensitivity cameras" aims at discovery of mysterious dark matter. Already in the 19th Century, scientists recognized "something" filling in Our Universe even though they are not visible to our eyes. Last fifty years, we are more confident "they exist". Moreover, recent observations indicate no more than 4% of Our Universe is visible. So far, many efforts were made to discover dark matter, however, no successful results have been report.

In this project, we try the never tried new approach to search for such mysterious dark matter. In 1984, De Rujúla and Glashow published an attractive theory on the *Nature* journal. They postulated a new type of dark matter called "nuclearite". Interestingly, they demonstrated nuclearites can be "observed" if they exist and pass in the atmosphere. Nuclearites may be even seen like shooting star meteors. Nuclearites are a type of dark matter particle called "strange quark matter". Like ordinary element like carbon, oxygen, iron, etc., they are made of elementary particles called quarks which are as very dense as 360,000,000,000,000 (= 360 trillion) times heavier than water of the same volume. Nuclearites may have any mass. Theoretically, it can be as heavier than the Sun and as big as ~20 km quark star like already discovered compact stars called "neutron stars".

Copernicus proposed Earth revolving the Sun in the 16th Century. Now, we know the Sun is not the center of the Universe. It revolves around Our Milky Way Galaxy at ~27,000 light years from the center of the Galaxy. Along with Sun, we move the toward the direction of the Cygnus constellation at about 250 km/s. Scientists cannot explain such a high speed without dark matter. Nuclearites have a mass and are bound by the Milky Way gravity. Near the Sun, they also move at similar speed to any direction if nuclearites exist. From the observers on the Earth, they look a bright light spot with a speed up to ~500 km/s.

The model of De Rujúla and Glashow indicates 1 kg nuclearites has a ~600 nm size. Very fast moving nuclearites hit the atoms and heat these atoms to result in the well-known black-body radiation emitting light until they cool down. This phenomenon takes place along the all path of the nuclearite. This light emission is similar to meteor shooting stars but happens near the sea level where air density is high. The speed is also different from meteors. The source of the meteors is considered the dust of comets revolving the Sun like planet, i.e. they are bound the Sun's gravity. The speed limit of meteors is no faster than 72 km/s to our eyes on the Earth. To find the nuclearites, we have to be able to take the video of even faster speed flying objects.

In this project, we are interested in nuclearites by two experiments. One is Mini-EUSO and the other is DIMS. We started the operation of Mini-EUSO a 25 cm telescope on the International Space Station (ISS) in October 2019 to monitor the Earth in the nighttime in the ultra-violet band. DIMS operates ultra-high sensitivity digital cameras for the meteor observation in the West Utah Desert, USA. DIMS group plans to build four automatic observation camera units deployed for meteors, particularly those with the origin out of the Solar System. This project will add another unit to specialize the nuclearite search.

The Mini-EUSO telescope is able to make a ultra-fast video at maximum 400,000 frame per second for 2000 pixels to study in details about the lighting and other phenomena. In orbit, Mini-EUSO keeps taking chronophotographic images about 24 frames every second to makes videos of 300 km x 300 km area. We already succeeded in making a first image of central Poland in the UV band. Many meteors were also observed. Seen from 400 km orbit, "500 km/s" looks slow enough by analyzing the Mini-EUSO data to search for kilogram nuclearites.

DIMS uses commercial digital cameras but with specially high sensitivity CMOS (Complementary Metal-Oxide-Semiconductor) sensor. These cameras make it possible to take ultra-fast nuclearite near the ground from the first time since the 1984 article. Even with only 1/30 s exposure, stars of the magnitude 10 can be recoginzed. In the test in Utah, we found ~3800 meteors in 40 hours by using two CMOS cameras. These cameras are able to take a video at ~60 frames per second with 2 mega-pixels. We aim at searching for about 1 gram nuclearite passing within ~30 km in this project.

In this project, if we find something consistent with the nuclearite, it may be the first long awaiting discovery of dark matter. Even no discovery is made, we will be still able to claim nuclearites would not exist no more than a particular value depending on how long we can monitor the night sky. We also expect the future application of CMOS technology in the space. Stay tuned and thank you for your support to our project!