

Agenda Item (12): Near Earth Objects

**Statement by the Representative
of the Republic of Korea
at the 57th session of the Scientific and Technical Subcommittee
of UN COPUOS
Vienna, 6 February 2020**

Thank you, Madam Chair, distinguished delegates and Ms. Simonetta Di Pippo, Director of the Office for Outer Space Affairs. I am very much honored to address this 57th session of the Scientific and Technical Subcommittee.

The threat posed by Near-Earth Objects (NEOs) has been addressed for decades as a critical issue by the United Nations Committee on the Peaceful Uses of Outer Space, not to mention the scientific community. I am pleased to say that the member states of the United Nations, including the Republic of Korea have been engaged in efforts to discover and physically characterize the nature of the population of NEOs, to assess the potential risks they pose to human civilization and the biosphere, and to implement proper mitigation measures. Such effort was led by Action Team 14 on NEOs in the past, and I am pleased to say that such efforts have undergone significant progress and expansion recently through the work of the International Asteroid Warning Network (IAWN), and the Space Mission Planning Advisory Group (SMPAG). I would like to extend my gratitude to NASA and European Space Agency for their remarkable leadership and vigorous efforts in their joint activities for IAWN and SMPAG.

Madam Chair,

As of February 2020, more than 22,000 NEOs have been discovered and their orbits characterized by the Minor Planet Center of the International Astronomical Union. However, most of those objects were detected in the northern hemisphere, and only a small fraction of these have had their physical properties identified at present.

We completed the construction of “KMTNet,” the Korea Micro-lensing Telescope Network in the mid-2010s. KMTNet consists of three identical wide-field 1.6 meter telescopes located in Chile, South Africa and Australia in the southern hemisphere where we do not have any dedicated facilities larger than 1 meter in aperture for scientific studies of NEOs. Based on round-the-clock targeted surveys utilizing KMTNet, we investigate the orbits and rotation periods of observed asteroids, while we study the spin states, 3-D shapes, and approximate surface mineralogy of a fraction of them. We expect that it will provide a practical solution to the demand from IAWN to bridge the gaps in global coverage with the coordinated use of telescopes, especially in the southern hemisphere.

In October 2017, the 10-meter-wide near Earth asteroid 2012 TC4 made a close approach to Earth at a distance of 50,000 km. For this special occasion, a community-led global planetary defense exercise was conducted by the members of IAWN with support from the NASA Planetary Defense Coordination Office. We used one of the KMTNet telescopes at Southerland, South Africa to collect high precision lightcurve data of this close-approaching asteroid. In 2019, Dr. Vishnu Reddy of the United States and the researchers who participated in this observation campaign led by IAWN shared the data and published a scientific paper. In this study, the analysis on the complicated light variation revealed that this asteroid has a tumbling motion. We collected additional data of TC4 obtained in the past for detailed period analysis to seek any possible changes in its rotation and/or precession periods. At the end of 2019, we unambiguously detected an obvious reduction in its precession period of as much as 18 seconds after its close approach to Earth.

In addition, we successfully obtained the spin state and the physical model of TC4 considering the gravitational torque by Earth during the encounter. We note that this is the very first confirmed observation of period change for an asteroid due to gravitational torque caused by close encounter with a planet.

Distinguished Delegates,

The Republic of Korea also participated in an observation campaign for the binary Near-Earth Asteroid (NEA) 1999 KW4 during its close approach to the Earth at the end of May and early June 2019. This was also led by IAWN and we used one of the KMTNet telescopes at Siding Spring, Australia. In the meanwhile, we discovered and reported a number of NEAs including a Potentially Hazardous Asteroid. In this regard, I am very pleased to say that the Republic of Korea is taking an active part in the efforts of IAWN.

At the same time, the Republic of Korea joined the SMPAG meeting to contribute to the United Nations' efforts to reduce the impact risks posed by NEOs. In Korea, we have a group of scientists who are well experienced in orbit calculations of celestial bodies and space crafts, including analysis of asteroid deflection missions. We expect them to contribute to the current endeavors of SMPAG in the coming years.

Madam Chair,

The Republic of Korea is willing to conduct scientific investigations of Earth-threatening asteroids, possible impact consequences, and mitigation measures, working with the member states who participate in the efforts of IAWN and SMPAG, in order to share our experience in the international community.

Thank you for your attention.