

**ISRAEL SPACE AGENCY & PLANETARY DEFENSE**

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ABSTRACT

The Israel Space Agency (ISA) joined the SMPAG & IAWN Subcommittees within UN-COPUOS in 2015 aiming to save lives all over the globe.

Planetary defense contains a wide range of topics and expertise. It ranges from tracking and characterizing Near-Earth-Objects (NEOs) via space missions to deflect or disrupt asteroids, to communication and disaster management, also using space assets, and more.

In the last four years, ISA conducted studies in order to find the right niches to help the world's effort. The studies were based on our space know-how, combined with hi-tech knowledge, special experts and defense experience. Also, we created an 'Israeli Planetary Defense Forum' of experts from various fields: astronomers (mainly asteroid researchers), space industry, defense, hi-tech, communications and home front command.

Asteroids and particularly NEOs research is performed in Israel's academic sector for many years. Israeli astrophysicists, observers and theoreticians, contribute to asteroid research especially in the fields of characterization and studying their evolution. The main observing facility is the WISE observatory (code 097), located in the Israeli Negev desert, which includes several 0.5 m to 1 m telescopes. One of WISE observatory's advantages is its unique longitude (E 34.7), which has a dearth of observing power. Therefore, WISE observatory can be used as an important observing station to fill the gaps in complete 24-hour coverage of the night sky. Our first goal is to connect the WISE observatory to the International Asteroid Warning Network (IAWN), by providing follow-up observations of new discoveries, and photometric measurements up to a visible magnitude of 19. Lately, we finished writing the connection platform, and hopefully soon, the WISE observatory and its experts will assist IAWN on asteroids research.

HAYABUSA2 is an asteroid sample-return mission operated by JAXA, on board of which was the Mobile Asteroid Surface Scout (MASCOT), a lander built by the German Aerospace Center (DLR). MASCOT contains space processor chip designed and manufactured by Ramon Chips from Israel. That same processor chip is in NASA CYGNSS constellation, in BERESHEET - the first Israeli moon lander as well as in other missions. This chip has already proved it self in deep space missions especially to asteroid.



Effective Space, founded in Israel, is developing a spacecraft intended to perform in-orbit servicing of existing satellites. The planned spacecraft will be able to service communication and other satellites by docking to them and performing orbital maneuvers. It will also be able to dock and dispose of space debris. As a spacecraft intended for in-orbit servicing it is uniquely suited also to handle space objects such as asteroids. The spacecraft will be able, under certain circumstances, to deflect a small asteroid.

In the last war, Sumer 2014, thousands of rockets were launched towards large Israeli civilian areas, but with almost no casualties. This miraculous achievement was partially due to special cell applications that warn people in the expected landing area. We believe that such applications, given the right adaptation, could help in short time warning in the occurrence of a Chelyabinsk case scenario.

Another important aspect of planetary defense is the management of consequences in case of failure of NEO mitigation space missions (5.8., SMPAG work plan). Israel has connected ImageSat International, an Israeli company, to supply satellite pictures of disaster areas for the UN-SPIDER Program in case of emergency needs. A contribution that can save lives by providing accurate and timely information for decision making.

More than that, for our own and other's needs, unfortunately, Israel is well experienced in disaster management, mainly search, rescue and medical assistance. For example, our search and rescue teams helped in locating missing people in Brazil's dam disaster in 2019, and the Katmandu earthquake in 2015 and many other disasters. Our medical teams were also the first to deploy field hospital and aid injuries after the Haiti earthquake in 2010. Many delegations from all over the world come to be briefed by our home front command teams.

The current talk presents our story of planetary defense efforts and summarizes our first stage study, focusing on Israel's potential to contribute to SMPAG, IAWN and the world in planetary defense issues or campaign.

Key words: Israel Space Agency, Planetary Defense