



28 January 2020

To:

International Asteroid Warning Network (IAWN)

Mr. Lindley N. Johnson

Planetary Defense Officer

Nasa Headquarters, Washington, DC 20546

USA

Dear Mr. Johnson,

On behalf of Israel Space Agency (ISA) we are pleased to inform you about our intention to participate in the International Asteroid Warning Network (IAWN) in order to assist its highly important activities and support the work of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS).

Attached

- A. Appendix-Weizmann Institute asteroid research funded by Israel Space Agency
- B. Statement of Intent

Sincerely,

Mr. Harel Hary Ben-Ami  
ISA delegate for  
IAWN & SMPAG Subcommittees  
COPUOS/UNOOSA

Mr. Avi Blasberger  
Director  
Israel Space Agency



## Appendix

**Weizmann Institute asteroid research funded by Israel Space Agency**

Israel space agency is funding an astronomical research for characterization of Near-Earth Asteroids (NEAs), to be performed by researchers at the Weizmann Institute of Science. The research will utilize our new constructed telescope, W-FAST, constructed at the Wise Observatory facility (MPC number 097). Equipped with a large field of view and a fast CMOS camera, the W-FAST will recover small and fast NEAs that appear as streaks on the 30-second exposure images of the Zwicky Transient Facility (ZTF) survey, that is located on Mt. Palomar (California), in which the Weizmann Institute is a member. We developed a novel algorithm to effectively detect these streaking NEAs (Nir et al. 2018) that is more sensitive than the current algorithm implemented in ZTF for streaks. The approximately half-day gap between Mt. Palomar and the Wise Observatory will enable us to establish the orbits of small-size NEAs before they are lost. In addition, we will characterize their sizes and spin. Such small NEAs can have extremely fast spins (current record is  $\sim 10$  s) with current surveys biased against faster spins. This makes our W-FAST's fast camera a powerful tool to securely establish rotations of seconds and shorter, with the potential to break current observational limits. In addition, we will enlarge the known properties of the progenitors of NEAs, asteroids in the main belt, by exploiting ZTF photometry of already observed over  $10^5$  asteroids. This will allow us to calculate, for the first time, the periodicity recovery efficiency that is critical to determine the completeness of photometric surveys, and it will allow proper de-biasing of asteroid and NEAs light curves statistics.

Facility	Location	Contribution
Weizmann Institute of Science	Rehovot, Israel	<ul style="list-style-type: none"><li>- Developing novel algorithms for detecting streaking NEAs (Nir et al. 2018).</li><li>- Mining photometric data for characterization of asteroids and NEAs at large surveys (e.g. ZTF).</li><li>- Study performed by Ofek &amp; Polishook.</li></ul>
Wise Observatory	Israeli desert	<ul style="list-style-type: none"><li>- Timely follow-up on streaking NEAs discovered on ZTF images by Weizmann's algorithm, using the W-FAST 0.56m telescope with its wide and fast Balor CMOS camera.</li><li>- Study performed by Ofek &amp; Polishook.</li></ul>

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