



2021 IAA Planetary Defense Conference:
26 April – 30 April 2021, Vienna, Austria

<https://iaaspace.org/pdc>

Call for Papers

Papers are solicited in the areas listed below for the *2021 IAA Planetary Defense Conference (PDC)*, hosted by the United Nations Office for Outer Space Affairs, under the auspices of the International Academy of Astronautics (IAA). The 2021 PDC will include a hypothetical impact event to be both a part of the conference (similar to what was done at the 2013, 2015, 2017 and 2019 conferences), and, where appropriate, to be used as a reference for papers and presentations (more details below¹). A student paper/poster competition will be held, and papers/posters eligible for the student competition should be indicated as such during submission. Limited student financial support may be available; students may inquire with the conference co-chairs: Bill Ailor (william.h.ailor@aero.org), Brent Barbee (brent.w.barbee@nasa.gov), Gerhard Drolshagen (gerhard.drolshagen@uni-oldenburg.de), Alex Karl (alexanderkarl@hotmail.com) and Nahum Melamed (nahum.melamed@aero.org).

A broad theme of the conference is to identify the technologies, techniques, missions, data sets, and processes that most need development for an international program of planetary defense. Topic areas for papers include:

Highlight/Spotlight topic areas

- Apophis 2029 and other interesting close approaches within the next decade.
- Findings applicable to planetary defense from OSIRIS-REx (NASA) and Hayabusa2 (JAXA).
- Activities related to the two planetary defense missions in development: DART (NASA) and Hera (ESA).
- Updates related to NASA's NEO Surveillance Mission.

Key International and Policy Developments

- The latest policy planning and developments to ensure an international planetary defense strategy.
- National strategies and plans for planetary defense.
- Updates from IAWN, SMPAG and UNOOSA/UN-SPIDER.

Advancements in Near Earth Object (NEO) Discovery

- The latest developments, products, and results on discoveries of potentially hazardous asteroids and comets.
- Current NEO survey progress, needs for future surveys, and related astronomical techniques for discovery of NEOs.
- Prospects for future NEO survey systems and efforts (e.g. Vera C. Rubin Observatory (LSST)).

New NEO Characterization Results

- The latest findings related to characterizing NEO physical, dynamical, and orbital properties.
- Characterization of properties most crucial to planetary defense mission success.
- Technologies to characterize NEOs via remote sensing and spacecraft flyby/rendezvous/landing.
- Recent work on planned or active flight missions to NEOs.

Deflection & Disruption Modeling and Testing

- Recent results in modeling/experimentation that characterizes the effects of proposed NEO deflection and disruption techniques and technologies.
- Recent progress on key technologies needed to deflect, disrupt, or otherwise mitigate hazardous NEOs.

Mission & Campaign Design

- Designs for planetary defense flight validation missions.
- Development and validation of critical technologies for planetary defense.
- New work in the design of in-space mission campaigns to respond to hazardous NEOs (reconnaissance, characterization, mitigation).
- NEO response mission campaign developments, including an international approach.

¹ Attendees are invited to use the threat scenario as a subject for their own exercises and for papers to be presented at the conference. Details on the threat are available at <https://cneos.jpl.nasa.gov/pd/cs/pdc21/>



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Impact Management & Consequences

- The hazards of an individual impactor, as well as consideration of the ensemble hazard integrated over the predicted population of impactors.
- Areas of greatest risk and suggested analysis tools that could aid decision makers.
- Interactions between incoming NEOs and the atmosphere; understanding the process of atmospheric break-up and airbursts for a variety of NEO types; this could include summaries of the Tunguska and Chelyabinsk superbolides, and lessons learned.
- The transition from regional to global effects as a function of impactor size, location, and other factors.
- New results on the effects of ocean and land NEO impacts, including tsunamis generated by impacts; characterization of the damage footprint for NEO impacts.
- Possible near- and long-term post-impact effects on the atmosphere, environment, near-Earth space and space systems (e.g., communications).

Disaster Management & Response

- Lessons learned from past natural disaster responses as well as exercises, alerts, public education, risk communications strategies, and warnings and how to apply them to Planetary Defense Management.
- Review of current and near-future disaster response plans and preparations specific to NEO impacts, incl. communication strategies for warning and informing decision makers, the general public and others.
- International perspective on disaster management in view of regional and national assets.

Public Education and Communication

- Current status of planetary defense / NEO-related communication and public education efforts, including dissemination, alerts, public engagement, student programs, outreach initiatives, etc.
- Concepts for improving NEO / planetary defense public education and communication.

The Decision to Act: Political, Legal, Social and Economic Aspects

- Outlook on current and future national and international planetary defense/NEO-response policies and decision-making processes.
- The value of international coordination and collaboration, and ways to distribute the responsibility for planetary defense.
- Legal aspects of NEO mitigation.
- Cost effectiveness of mitigation options.
- Short and long-term economic, political, and social consequences of a serious threat or an impact.

ABSTRACT SUBMITTAL: Technical paper abstracts (250 to 500 words in length) in the areas described above or related to planetary defense will be accepted electronically through the conference website (<http://iaaspace.org/pdc>) beginning **September 1, 2020**. Please be sure to designate the topic area your paper addresses (see topics listed above). Please also indicate whether the abstract is eligible for the student competition (see below). The deadline for receipt of abstracts is **January 31, 2021**. Letters of official acceptance will be mailed on or before **February 15, 2021**.

PAPERS: Full-length manuscripts or two-page extended abstracts are due by close of business on **March 31, 2021**. Revisions and corrections will be accepted within two weeks after the end of the conference. The format for papers is specified on the conference website. Accepted papers (including two-page extended abstracts and poster papers) will be published on the official conference proceedings and hosted at the IAA website. Full-length manuscripts may be considered for publication in a special edition of *Acta Astronautica*.

STUDENT COMPETITION: One or more of the best student paper(s)/poster(s) will be awarded a prize. The aim of the student competition is to help promote academic work and informed political debate by enhancing research and general understanding essential for sound decision making on NEO impact threats in years to come.