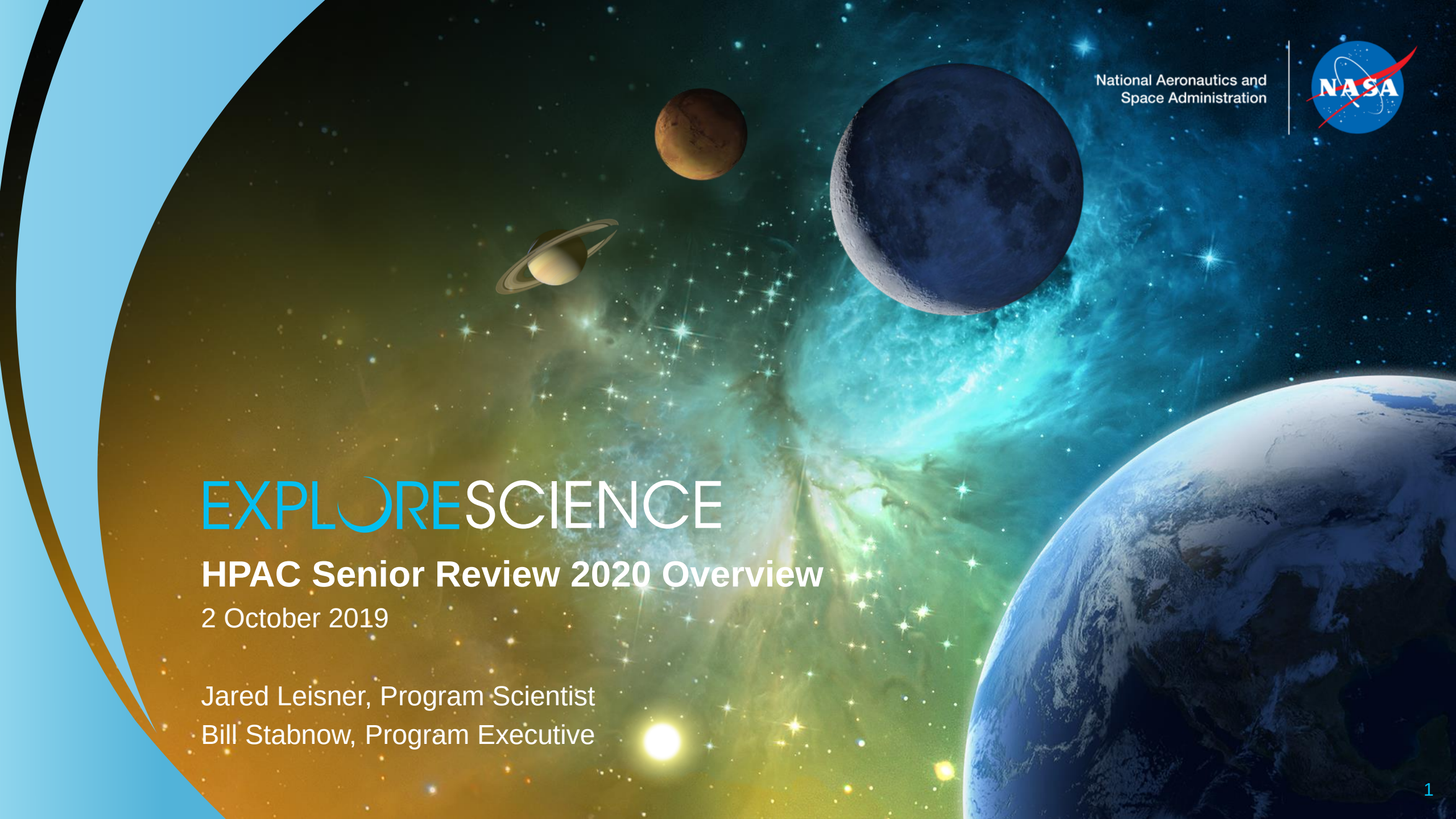

EXPLORESCIENCE

HPAC Senior Review 2020 Overview

2 October 2019

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Introduction

- The Heliophysics Division is changing the Senior Review (SR) process.
- The goals are:
  - to maximize the science return (from missions and from the Heliophysics System Observatory (HSO);
  - to ensure data are archived, usable, and useful;
  - to properly treat the archives as an aspect of the HSO concept;
  - to reduce the burden on the missions and for NASA in assessing continued operations; and,
  - to ensure that NASA stakeholders have better insight into our decision processes.

- Lessons learned this year will inform the next SR (in 3 years).

Draft HPD Senior Review 2020 Timeline

- **October 24, 2019:** Draft Call for Proposals comments due
- **October 31, 2019:** Final Call for Proposals issued
- **February 20, 2020:** Proposals due
- **Spring 2020:** Face-to-face SR panel meeting
- **Summer 2020:** Final mission direction, public announcements
- **Summer 2020:** Outbrief of SR results to HPAC

Summary of Changes in SR 2020 (1/2)

- **Missions may propose either a science investigation or to move into HSO infrastructure**
  - HSO infrastructure does not receive research funding, but would continue operations.
  - Missions that propose a science investigation may be funded only for HSO infrastructure operations.
- **Code and computing**
  - Proposals must present plans to move to open source code.
  - Proposals must report high-end computing resources required.
- **Science Objectives (SOs)**
  - Prioritized Science Goals are no longer used.
  - SOs are what the mission itself will do in the SR 2020 extended mission period, within the proposed budget.
    - Other science possible with the mission data falls under Contribution to the Heliophysics System Observatory evaluation criterion.
  - SOs must be accompanied by science Level-1 Requirements.

Summary of Changes in SR 2020 (2/2)

- **Project Data Management Plan (PDMP)**
  - Mission Archiving Plans (MAPs) are no longer used.
  - PDMP must be updated for SR 2020 (sample PDMP format provided with Call for Proposals).
  - PDMP has an Algorithm Theoretical Basis Document (ATBD) appendix.
    - ATBD receives only comments in SR 2020, but will be fully evaluated in future SRs.
- **Data archiving**
  - Mission science data must be archived in Space Physics Data Facility (SPDF) and Solar Data Analysis Center (SDAC), not only non-NASA archives.
    - Evaluation of usefulness and usability of data archived in SPDF and SDAC.
  - Real-time data must be preserved in originally downlinked form; updated/revised data sets archived separately
- **Code**
  - Requirement for plans for migration to open source; not evaluated in SR 2020, but expected for SR 2023
  - Requirement for open algorithms; comments provided in SR 2020, evaluated in SR 2023

Science Objectives and Level-1 Requirements

Science Objective: A scientific target that is a narrowly focused part of a larger strategy to achieve a Science Goal and is to be achieved by a single mission. A mission demonstrates achievement of a Science Objective by meeting the associated Level-1 requirements.

Level-1 Requirements: The science performance specifications that serve as 1) the source of flow down for all measurement, system, and other mission requirements, and 2) the criteria by which NASA judges a mission's successful achievement of a Science Objective.

- They shall be necessary, sufficient, and complete for the Science Objectives from which they flow down.
- They shall be unambiguous, objective, quantifiable, and verifiable.
- They shall not describe measurement, payload, or any other lower-level mission requirements, nor shall they prescribe implementation details.
  - *L1 example:* The mission shall determine the partitioning of energy input by Event ABC between 350 and 400 km altitude, to account for 80% of the total input energy with an accuracy of 10% per energy path.
  - *L2 and lower-level examples:* The mission shall measure the AC electric field between 10 and 100 kHz, with a frequency resolution of 5 kHz. The mission shall observe 200 events. The mission shall maintain an inter-spacecraft spacing of between 50 and 100 km.

Backup