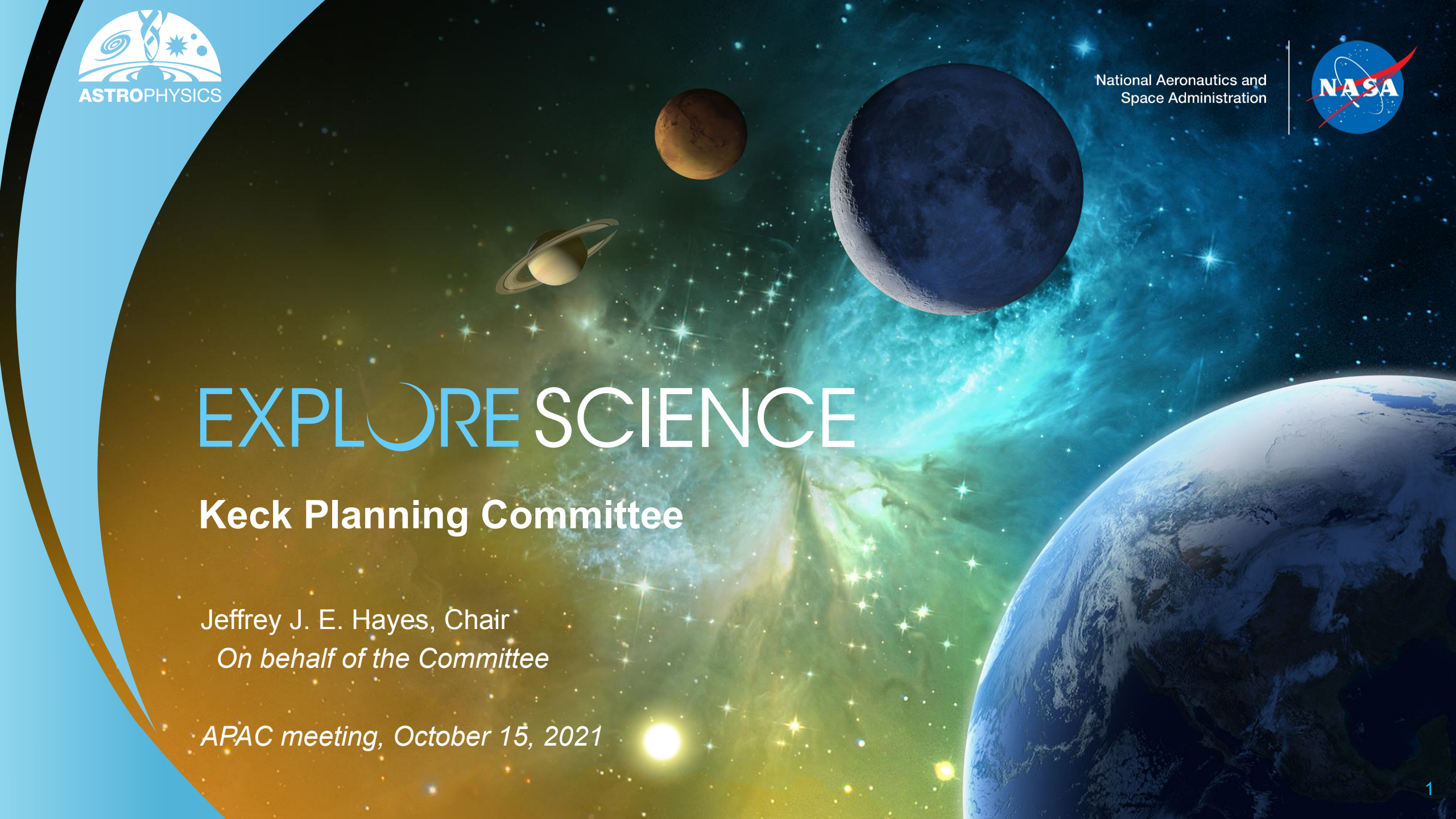
ASTROPHYSICS

National Aeronautics and Space Administration

NASA



EXPLORE SCIENCE

Keck Planning Committee

Jeffrey J. E. Hayes, Chair
On behalf of the Committee

APAC meeting, October 15, 2021

The Members of the Planning Committee

Many sincerest thanks to the other members of the committee for their help and time.

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I would also like to thank John O'Meara and Hilton Lewis at W.M. Keck Observatory (WMKO), and Chas Beichman and Dawn Gelino at NASA Exoplanet Science Institute (NExScI), and their teams for preparing the material reviewed and responding to the questions of the committee.

Charter of the Committee

Why we were called into existence…

Background –

NASA has had a partnership with the W.M. Keck Observatory (WMKO), Maunakea, HI, for over twenty years. With its twin telescopes, each composed of ten-meter diameter primary mirrors, diversity of instruments, and superb observing conditions, this powerful telescope has proved an important asset to support NASA science, both in the fields of astrophysics and planetary science. The objective of this partnership is to maximize the science from NASA flight missions by offering the science community an opportunity to perform ground-based observations that supplement / complement science programs from NASA flight missions; enabling flight missions to attain their Level 1 science requirements; providing data to assist in future mission planning; verification and validation of flight data.

Based on the FY 2022 planned budget, the cost to NASA for the support of WMKO and NExScI averages about $7,500k per year. The split is ~$4900k to WMKO operations, and the balance, ~$2,600k, goes to NExScI (archive support, GO funding, etc.)

Charter of the Committee

Objective –

”The current partnership is in the form a five-year Cooperative Agreement (CA), through which NASA is a one-sixth partner in Keck operations. The Keck Program is managed for NASA through the Astrophysics Division (APD) at NASA Headquarters…

… The current five-year CA ends on February 28, 2023. The objective of the review is to develop findings that reflect the advantages and disadvantages of continuing this partnership for another five years. The Panel Chair will present the panel findings to the NASA Astrophysics Advisory Committee (APAC) on October 13 and 15, 2021, which will advise the Astrophysics Division Director whether to solicit a sole-source proposal for continuation of the CA for another five years.”

Charter of the Committee

Scope and Schedule –

The panel reviewed the detailed information provided by NExScI on the NASA programs conducted in the past five years, as well as the parts of the WMKO Science Strategy or WMKO Science Plan relevant to future NASA science missions, as presented by WMKO Observatory Director or Chief Scientist. Based on the material presented, the panel was assigned the following tasks:

- Met with the WMKO and NExScI teams September 24, 2021
- Evaluated the contribution and productivity of Keck to support NASA flight missions in achieving NASA's strategic goals.
- Evaluated the plan of Keck in the next 5 years towards support of NASA flight missions, incorporating the science priorities and programmatic recommendations of the Astrophysics 2020 Decadal Survey, if available.
- Prepare findings to present to NASA's Astrophysics Subcommittee on October 15, 2021.

We are now at this final step.

Findings – Advantages

The recent 2022A submissions show 96 proposals having been received. The Key Strategic proposal oversubscription rate is 5.6, while the GO oversubscription rate is 4.4. Clearly this is a significant and important resource to the NASA community. (Details of the Call and types of time awarded are found at https://nexsci.caltech.edu/missions/KSA/)

As a formal partner, NASA receives exceptional special consideration from WMKO with respect to the agency needs. Along with this, there is a high degree of mutual respect and collaboration in the joint work.

NASA participation in observatory planning ensures attention to NASA's requirements and objectives.

NASA benefits tremendously from the continuous major upgrades of the facility without being the major contributor to those efforts.

Findings – Disadvantages

NASA is not a voting member of the CARA board but is an important participant.

- The above means that any new priorities must be negotiated as opposed to directed.

Keck and by default NExScI have an 18-month default proprietary (exclusive use) period for all data obtained on the telescopes. This includes NASA data but can be waived at the request of the PI. This exclusive use period should be more nuanced and evolve to match the periods of other NASA supported facilities.

Overall findings to the ApAC

The committee finds that the WMKO and NExScI activities provide a tremendous benefit to NASA's goals of furthering scientific research across a broad range of activities in Astrophysics and Planetary Sciences.

The committee finds that cost to NASA (est ~$7,500k in FY22) is an excellent value and allows NASA researchers the ability to use a premier ground-based facility. NASA should carefully consider whether additional investments in the Keck facilities would be of advantage the NASA community's needs.

The committee finds that NASA should use its influence to modify the 18-month proprietary period for, at a minimum, NASA-funded research to better match the shorter periods in-place with current and future NASA missions.

The committee finds that NASA should continue the Data Services Initiative (DSI) as this would allow for higher-level data products to be created as well as the development of instrument calibration pipelines. This would enhance the ability of the Keck Observatory Archive (KOA) to serve both the NASA and broader astrophysical user community.

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