

NASA is Developing Technologies to Enable Breakthrough Observations in the Coming Decades

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ABSTRACT

The three broad scientific questions driving astrophysics research are “How did our universe begin and evolve?” “How did galaxies, stars, and planets come to be?” and “Are we alone?” Answering these compelling questions requires space observatories with ever-increasing capabilities. To drive such capabilities, NASA’s PCOS, COR, and ExE Program Offices (POs) manage technology maturation projects funded through the Strategic Astrophysics Technology program, as well as directed funding programs. We present an overview of NASA’s Astrophysics Division (APD) strategic technology development activities. In preparation for the 2020 Decadal Survey, APD established Science and Technology Definition Teams (STDTs) to study four large-mission concepts: the Origins Space Telescope, Habitable Exoplanet Observatory, Large UV/Optical/IR Surveyor, and Lynx. The STDTs will develop the science case and design reference mission, assess technology development needs, and estimate the cost of their concept. The teams will submit their final reports in 2019. Their initial technology gaps had been incorporated into our gap prioritization process. Once their final reports are submitted, the gaps they identified will continue to be prioritized, with continuing input from the community and the three Program Analysis Groups (PAGs). As of this year, APD directed the three POs to coordinate their gap solicitation and prioritization processes, and to reduce the cadence to every other year. We discuss the new process and how the resulting prioritization and investment recommendations will inform the SAT program. The Programs’ priorities are driven by strategic direction from APD and the Astrophysics Implementation Plan which is informed by the Decadal Survey and the Astrophysics Roadmap “Enduring Quests, Daring Visions.”

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