The Flagships of the Space Fleet

By exploring planets, moons, asteroids and comets, these spacecraft are extending the frontiers of human knowledge

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NASA

FIERY BEAUTY of a night liftoff of the shuttle Endeavour

Few sights are as awe-inspiring as the liftoff of a space shuttle. Propped on its pair of solid-rocket boosters, the shuttle towers over the launchpad at the Kennedy Space Center in Cape Canaveral, Fla. Hundreds of engineers and technicians man the consoles in the Launch Control Center, monitoring the shuttle's systems as the countdown proceeds. Half a minute before liftoff, the shuttle's onboard computers take over the launch sequence, and at T minus six seconds they send the command to start the main engines. Fiery exhaust billows downward from the shuttle's three rocket nozzles. At T minus zero, the solid-rocket boosters ignite, the umbilical lines retract and the shuttle climbs into the sky with 3.6 million kilograms (eight million pounds) of thrust.

The space shuttle grabs the public's attention—and a big share of the budget of the National Aeronautics and Space Administration—because it carries astronauts into orbit. But it is by no means the only vessel in the space fleet. In recent years, NASA has sent unmanned spacecraft to explore Jupiter, Saturn, the asteroid belt and the moon. What these missions lack in personality they make up for with remarkable discoveries. The Galileo spacecraft, for example, has returned spectacular images of Jupiter's moons and that planet's Great Red Spot. Closer to home, the Lunar Prospector probe has found evidence of ice on the poles of Earth's moon.

Half a dozen of the most extraordinary unmanned spacecraft are profiled on the following pages. Three of these probes—Galileo, Cassini and the Chandra X-ray Observatory—are large, expensive machines packed with scientific instrumentation. But the three others—Near Earth Asteroid Rendezvous, Lunar Prospector and Stardust—are part of NASA's new Discovery series of "faster, better, cheaper" spacecraft. Lunar Prospector is perhaps the best example of a cost-effective craft: the mission is being done for only $63 million. In contrast, a typical space shuttle mission costs about $420 million.

Over the next 10 years, about 50 more unmanned science probes are expected to blast off into space (for a comprehensive list, see pages 18 and 19). Many of these craft will venture across the solar system, and others will scan the heavens from Earth's orbit. NASA will not be the only player—the European Space Agency, Russia, Japan and others plan to launch their own vessels. This international armada will revolutionize our understanding of the universe and perhaps pave the way for manned missions to other worlds. *—The Editors*