Key Points

- Recent advancements in space technology from July 11 to July 17, 2025, include significant developments in hypersonic propulsion, orbital refueling, and laser-powered launches.
- The European Space Agency’s INVICTUS project is developing a hypersonic space plane, potentially revolutionizing space access by 2031.
- China’s Shijian satellites have demonstrated orbital refueling, which could extend satellite lifespans and aid in debris management.
- Tohoku University’s laser propulsion experiment marks a step toward fuel-free rocket launches, promising cost reductions.
- NASA’s ESCAPADE mission, set to launch on Blue Origin’s New Glenn, highlights growing public-private collaboration in space exploration.
- These developments face technical, regulatory, and safety challenges but suggest a future of more sustainable and accessible space operations.

Hypersonic Space Plane Development

The European Space Agency (ESA) is funding the INVICTUS project, which aims to create a reusable hypersonic space plane capable of flying at five times the speed of sound. This

could make space travel more like air travel, with vehicles taking off from runways and reaching orbit efficiently. The project is in its early stages, with a design expected by mid-2026, and it's seen as a step toward faster, cheaper space access.

Orbital Refueling Breakthrough

China has made headlines with its Shijian-21 and Shijian-25 satellites, which reportedly docked in orbit to transfer fuel. This technology could keep satellites working longer and help clear space junk, making space operations more sustainable. It's a complex process, and while it's a major achievement, it also raises questions about how such technologies might be used in the future.

Laser-Powered Rocket Experiment

Researchers at Tohoku University in Japan have tested a tiny rocket powered by laser beams, which reached a height of about 11 centimeters without using traditional fuel. This early-stage technology could one day lead to much cheaper rocket launches, as it relies on ground-based lasers instead of onboard fuel, but scaling it up for real space missions will take time.

Mars Mission with New Rocket

NASA's ESCAPADE mission, which will study Mars' atmosphere, is set to launch on Blue Origin's New Glenn rocket later in 2025. This mission shows how private companies are teaming up with space agencies to use new rockets for scientific exploration, potentially making missions more cost-effective.

What's Next?

These advancements suggest space travel could become more efficient and sustainable. However, challenges like ensuring safety, managing space traffic, and creating clear rules for new technologies need to be addressed. If successful, these projects could make space more accessible, from faster trips to orbit to longer-lasting satellites.

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