



The Exploration Company Leverages Ansys to Promote Sustainability in Space

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Ansys' multiphysics simulation solutions advance The Exploration Company's next-generation green propulsion system

/ Key Highlights

- [Ansys Startup Program](#) customer The Exploration Company uses Ansys solutions to develop Nyx, its orbital logistics vehicle that uses a revolutionary methane-based propellant for sustainable space exploration
- With Ansys multiphysics and materials data management solutions, engineers seamlessly model the Nyx propulsion, engine, and body to support a broad scope of missions planned between 2024 and 2028

PITTSBURGH, April 4, 2024 /PRNewswire/ -- Space logistics startup The Exploration Company is advancing sustainable space exploration by leveraging [Ansys](#) (NASDAQ: ANSS) simulation solutions to develop its modular and reusable space vehicle, Nyx. With a revolutionary methane-based propulsion system, Nyx will begin by flying to stations in Earth's orbit to deliver technologies for advanced research in areas such as microgravity, which has applications in the pharmaceutical and agricultural industries, among others.

Spacecraft propulsion systems are designed to withstand extreme loads and high thermal and pressure variables, without adding significant weight to the vehicle's overall mass. Conventional turbo engines are heavy and rely on fossil fuels, posing sustainability challenges and range limitations as the space industry intensifies launch activity and deeper space exploration. Methane propulsion systems offer a potential solution — emitting fewer pollutants, extending travel capabilities, and achieving more predictively accurate landings because they are more agile and easier to navigate.

Nyx is designed to carry cargo to and from the Moon and space stations, free fly around Earth, re-fuel in orbit, and re-enter Earth's atmosphere before embarking on future missions. The building blocks of Nyx are openly available to a wide array of aerospace companies to support the transition from gas- to electric-powered travel — not only democratizing space exploration but improving its sustainability.

The Exploration Company leverages Ansys solutions to fine tune engine and body specifications and speed development time for the reusable orbital vehicle. The team uses [Ansys Fluent™](#) and [Ansys Mechanical™](#) to optimize the design of propellant pumps and the overall engine layout, supporting systems that meet technical requirements for performance and durability. Additionally, [Thermal Desktop™](#) plays a crucial role in the thermal design of Nyx, while [Ansys Granta™](#) helps source and manage material data, driving simulation accuracy, reducing material costs, and lowering project risk.

"Through the Ansys Startup Program, we can answer critical design questions in the early stages of our engines' development," said Sebastien Reichstadt, lead propulsion engineer at The Exploration Company. "Ansys' proven high-fidelity simulation and interactive modeling allow us to quickly conduct iterative designs and prototyping up to validation. Only with Ansys simulation can we ensure that the propulsion systems of Nyx will meet the stringent requirements of spaceflight and reusability."

"Efficient, eco-friendly propulsion is the next milestone in exploring the cosmos with greater precision," said Walt Hearn, senior vice president of worldwide sales and customer excellence at Ansys. "In an industry that has many obstacles to physical prototyping, Ansys provides mission critical technology that empowers customers like The Exploration Company to strongly correlate simulation results with real-world data before ever going out into space. This results in a significant reduction in project costs and accelerates the timeline for unlocking the mysteries of deep space."

To learn more about Ansys multiphysics simulation solutions and its role in Space 2.0, [visit Ansys at Space Symposium](#), April 8-11 in Booth #1049.

/ About Ansys

Our Mission: Powering Innovation that Drives Human Advancement™

When visionary companies need to know how their world-changing ideas will perform, they close the gap between design and reality with Ansys simulation. For more than 50 years, Ansys software has enabled innovators across industries to push boundaries by using the predictive power of simulation. From sustainable transportation to advanced semiconductors, from satellite systems to life-saving medical devices, the next great leaps in human advancement will be powered by Ansys.

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