Dream Big: Six-Satellite Constellation to Inspire the Next Generation of Innovators and Manufacturers

UPLAND, IN, UNITED STATES, November 12, 2024 / EINPresswire.com/ -- In a groundbreaking initiative, NearSpace Education's (NSE) Dream Big project is set to launch a six-satellite constellation with the mission to engage the next generation of students in advanced manufacturing and space technologies. Partnering with 6 Tri-state area colleges and reaching out to 18 additional student groups across the region, the program aims to inspire young minds through hands-on experiences in space exploration, engineering, and scientific discovery.

The "Dream Big" project will take flight aboard a rideshare mission offering a cost-effective and efficient way to deploy satellites. Focusing on system de-risking, cost reduction, testing entry-level communication systems, and remote sensing technologies, the initiative provides students with an unprecedented opportunity to witness real-world applications of the technologies they are learning about in classrooms.

This initiative aligns with the core mission of NSE to inspire, equip, and impact students, preparing them for

Dream Big mission patch

Dream Big constellation

future challenges. The project fosters critical skills in problem-solving, innovation, advanced manufacturing techniques, and entrepreneurship while making a tangible impact on student learning.

NearSpace Education logo

The students involved will gain insights into essential missions, including communication tests and remote sensing activities, showcasing how space technology can improve everyday life. By highlighting these practical applications, Dream Big not only lowers entry barriers into aerospace but also equips students with the tools and knowledge necessary to shape the future of space exploration.

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> Through a hands-on learning environment, we empower students to envision careers in dynamic fields like the space industry, preparing them for a rapidly evolving landscape."
>
> *Matt Voss*

University Partners

Purdue University Fort Wayne - The team from PFW's College of Engineering, Technology, and Computer Science aims to detect outliers in greenhouse gas emissions to help regulate their environmental impact and provide affordable detection of aerosols, such as sand and dirt, to warn communities of incoming hazards. The project will offer a service model that collects emission data from companies, helping them develop decarbonization plans. Governments could also sponsor the project to monitor emissions and protect communities from climate-related events.

Taylor University - The Taylor University Physics and Engineering Department's senior project is the brain behind SkyForge, a space-walking robot designed to assemble large truss structures in orbit. SkyForge is equipped with a redundant computational system, ensuring reliable operation in the harsh conditions of space. A prototype of this groundbreaking computational system will be launched into space through NSE's Dream Big program, marking a major milestone in student-led innovation for space exploration.

University of Notre Dame - The Notre Dame IrishSat team is designing a modular magnetorquer-only Attitude Determination and Control System (ADCS), providing a low-power, scalable solution for satellite autonomous pointing and stabilization. This application will advance satellite technology by developing a cost-effective, reliable ADCS with reduced sensor data requirements. With this small, simplified solution, satellite developers can buy this module and use it on their platforms for detumble and rough pointing.

University of Toledo - The University of Toledo's Dream Big team, along with partnering high schools, aims to engage students in remote sensing, teaching them how sensor electronics work

while addressing environmental issues. Their goal is to produce a ThinSat to monitor land cover and its effects on surface temperature, with potential applications such as tracking algae growth on Lake Erie and other bodies of water.

Valparaiso University - The Valparaiso University team BCON-2 project will demonstrate efficient coordination of satellite data downlinking using the crowd-sourced SatNOGS Network. Acting as an independent satellite, it integrates a University of Luxembourg attitude control system and operates within a 0.5U ThinSat. By simplifying communication systems and reducing spacecraft complexity, BCON-2 enables inexperienced teams to generate scientific data, expanding space participation. Crowd-sourced downlinking also allows students and non-professionals to contribute directly to space missions, enhancing research and development in the field.

Western Michigan University - The Western Aerospace Launch Initiative's team's main goal is to design and test a Langmuir Probe to measure the ion density of the plasma in Low Earth Orbit. This data could help further the development of efficient propulsion technologies. These improvements could lead to more sustainable satellite operations and increased feasibility for small satellite deployments.

Partners

[NearSpace Launch](#) (NSL), a leader in satellite innovation with over 100 satellites and 900 subsystems currently in orbit, has been instrumental in the success of the Dream Big project. NSL first made history by building Indiana's inaugural satellite in partnership with Taylor University in 2014, and they continue to push the boundaries of space exploration. For this project, NSL is working closely with our team and the universities to ensure seamless integration of their payloads into the satellite bus they are developing. In addition to constructing the satellite bus, NSL will provide a communication system that will transmit data from space back to Earth, enabling students and researchers to analyze real-time results and gain valuable insights.

NearSpace Education (NSE) 501c3

NearSpace Education is a nonprofit organization dedicated to inspiring and equipping the next generation of STEM leaders through hands-on learning experiences in aerospace and advanced manufacturing. Based in Upland, Indiana, NearSpace Education engages students through innovative programs such as high-altitude balloon launches, satellite design projects, year-round aerospace clubs, and summer space camps. By providing access to industry-grade equipment and real-world STEM challenges, we aim to foster curiosity, creativity, and practical skills in young minds. Our mission is to broaden pathways into STEM careers, empowering students to explore, innovate, and impact the future of space and technology.

About the Contributors

Don Wood Foundation and the Avis Foundation have been instrumental in making the Dream Big project a reality. Their continued support enables students to access advanced tools and resources, creating a unique learning experience that bridges education with the aerospace industry and advanced manufacturing.

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