Partnership with Cal Poly Pomona Enhances Curriculum and Accelerates Tech Transfer

A unique partnership between NASA's Armstrong Flight Research Center and California State Polytechnic University, Pomona (Cal Poly Pomona) is demonstrating the positive power of government-academic collaborations. Led at Armstrong by the center's Technology Transfer Office (TTO), the partnership with Cal Poly Pomona comprises two programs:

- Technology Assessment: Students in this 1-semester program work in pairs to evaluate the technical and commercial potential of inventions developed at Armstrong.
- Business Startup: This 1-year program enables student entrepreneurs to create new businesses and products based on or incorporating NASA technologies.

Since 2014, these successful programs have helped Cal Poly Pomona students apply their classroom learning to real-world projects, bolster their preparedness for the job market, be inspired to pursue STEM (science, technology, engineering, math) careers, and even create products and prepare to launch startup companies.

Students Su Yeon and Ashish Hingle visit with Allen Parker and Jamal Quinnert of NASA's Armstrong Flight Research Center. (photo courtesy of Dr. Olukemi Sawyerr, Cal Poly Pomona)

Students on the Fantom startup team work on their new industrial fan, based on the PRANDTL-D wing design developed at NASA's Armstrong Flight Research Center. (photo courtesy of Dr. H. Erkan Ozkaya, Cal Poly Pomona)

Benefits of Partnership

- **Enhanced Curriculum**: Moving beyond theoretical exercises into market analysis and product development with real-world technology—while interacting with NASA inventors—greatly enriches student learning.
- **Support for the TTO**: Students' technology assessments provide information and analysis that the TTO uses in targeting potential licensees/partners and its other technology transfer efforts.
- **Accelerated Tech Transfer**: The startup program provides funding for prototyping and testing to demonstrate NASA technology for industry use.
- **Reaching Underrepresented Groups**: Nearly half of the student participants are women, and Cal Poly Pomona is recognized as a Hispanic-Serving Institution.
- **Trend Setting**: The partnership agreement structure makes it easy for Cal Poly Pomona to expand its NASA involvement to other centers. It also serves as a template for other universities to work with NASA similarly.

About Cal Poly Pomona

Located in Los Angeles County, Cal Poly Pomona takes a learn-by-doing approach to education. The university offers a unique blend of affordability, access, and academic excellence, which helps low-income students reach personal, career, and financial success.

The partnership with NASA Armstrong is based in the university's Student Innovation Idea Lab, which supports student creativity, innovation, and entrepreneurship.

Partnership Origins

Armstrong and Cal Poly Pomona had collaborated on technology transfer projects in the past. However, the partnership kicked into high gear in 2014 when NASA Headquarters

"The TTO has been beyond supportive. They have done a lot of things that go the extra

launched the Technology Transfer University Program and Armstrong's TTO reestablished the Technology Assessment program at Cal Poly Pomona. After several successful semesters of assessments, the partners pursued establishing the Business Startup program as a new initiative, inspired by the new Startup NASA program out of Headquarters.

The Tech Transfer Process

The TTO and Cal Poly Pomona worked collaboratively to develop a unique Space Act Agreement (SAA) that gives students access to NASA technology *before* they establish a startup company and sign a license. The SAA allows students to work under nondisclosure agreements as they proceed through their coursework, developing prototypes and building a customer base. Then, if they are successful in attracting the interest of venture capitalists, students form a startup and *then* sign a non-exclusive license for the NASA technology.

To maximize efficiency, the TTO designed the agreement as an "umbrella" SAA, making it very easy for other NASA centers to engage with Cal Poly Pomona. It also serves as a model for other universities and across all NASA centers. In fact, this successful partnership received an award from the Far West Region of the Federal Laboratory Consortium for Technology Transfer.

Technology Assessment Program

In this semester-long program, undergraduates in the business and engineering schools work in pairs to assess the technical and commercial potential of an Armstrong invention. These multidisciplinary teams then engage with the inventors, whose passion for their research is inspiring for students. Teams also conduct independent research to determine the inventions' patent and market potential, gaining valuable real-world experience.

The TTO provides funding so that students can function essentially as tech transfer interns, receiving a reasonable salary and invaluable experience for their résumés. Students also have the chance to present their findings to Armstrong personnel.

mile and have been incredibly involved in the students' development."
– Dr. Olukemi Sawyerr, Cal Poly Pomona professor

"Cal Poly Pomona students are top notch. And I have had several companies and job placement agencies call me because students include us on their résumés. So, this program is clearly helping with their careers."
– Laura Fobel, Tech Transfer Officer, NASA's Armstrong Flight Research Center

"The internship was a great and valuable experience, and I really enjoyed it. I have learned and grown so much from those projects. They will surely be one of my best memories at Cal Poly Pomona."
– Peter Nguyen, NASA Technology Assessment Program student

"The decision to join the Business Startup Program has been one of the best choices I have made because it has allowed me to apply my knowledge in a way that is both exciting and practical. The learning environment in this program brings out the best in me, and it is why I continue coming back for more."
– Adrian Brito, NASA Business Startup Program student

Business Startup Program

This program assembles startup teams of students and faculty mentors brought together from across 18 Cal Poly Pomona departments. Teams include students from engineering, business, and even graphic design. They work together throughout the project, providing students with the unique opportunity to learn all aspects of the entire product-development cycle. As with the assessments, teams present to and engage with Armstrong researchers and TTO staff, learning to communicate with a variety of audiences.

Funding to cover prototype development and other expenses has been provided by the nonprofit VentureWell, with business competition prizes providing additional funding.

Startup Examples

One student team created Fantom, a redesigned blade for industrial fans based on Armstrong's new PRANDTL-D aircraft wing design for reducing drag and increasing fuel efficiency. The blade is 11% more energy efficient than typical blades and significantly quieter, which will reduce energy consumption, noise pollution, and CO2 emissions as well as health hazards for workers. The team took first place at Cal Poly Pomona's Bronco Arena Business Concept Challenge, and angel investors have contacted the Fantom team, which is currently developing its minimum viable product (MVP).

Another team developed a device that attaches to a cellphone and turns it into a microscope, providing a low-cost alternative to bulky, hard-to-use microscopes. The Bioscope team has greatly benefitted from TTO-provided information about related NASA technologies as well as letters of support and input from Armstrong personnel regarding technical challenges. In 2017,

Bioscope won a $10,000 prize in Cal Poly Pomona's Bronco Startup Challenge.

Looking Ahead

As this partnership moves into the future, Cal Poly Pomona students will continue to assess Armstrong technologies and push forward with developing new startups based on NASA technology.

For More Information

If you would like more information about this technology, please contact:

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