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MIT interns prepare for an economy that looks to space The Boston Globe

By Mark Baard, Globe Correspondent | July 3, 2006

Summer internships are where college kids get their first taste of the workplace: the grunt work, the endless meetings, the office gossip, and the tired jokes -- all of which can come without a salary or benefits.

But Diego A. Melani's new internship is shaping up to be something quite different. While many of his peers will find themselves replacing toner cartridges and fetching dry cleaning for the office diva, the Massachusetts Institute of Technology senior will design part of a spaceship.

Melani is one of more than 30 interns in the Mars Gravity Biosatellite Program at MIT. It has a peculiar mission: to send 15 mice inside a tiny satellite into Earth's orbit for five weeks, perhaps as early as 2010.

As the satellite rotates in space at 32 revolutions per minute, its centrifugal force will simulate Mars's partial gravity, which is roughly one-third of Earth's pull. The Mars Gravity team hopes its data will help scientists predict how the partial gravity on Mars might contribute to bone and muscle loss, and other ill effects, in human explorers and colonists.

Melani, whose past internships have included relatively boring stints at an engineering company and a private investments firm in his native San Juan, will spend much of his time working with computer-design programs and contributing to the building of scale models of the biosatellite in a basement machine shop off Vassar Street at MIT.

His fellow interns will work on other aspects of the program, involving everything from aerospace engineering and medicine to human physiology and psychology.

All of these disciplines will be in high demand in what some space entrepreneurs are calling the "inner solar system economy," in which they expect humanity to spread out to the moon and Mars to colonize and exploit the resources of these new frontiers.

Private firms such as the space tourism company Zero Gravity Corp. and the space business consultancy 4Frontiers Corp. (which maintains an office in Woburn) have already attracted dozens of interns, many of them with advanced degrees.

Building the inner solar system economy will not look like your daddy's space race. Cold War brinksmanship drove astronauts to risk their necks getting to the moon in 1969. And NASA does have plans for robotic and human exploration of the inner solar system, which it calls "Moon, Mars, and Beyond," and includes putting a human back on the moon by 2020. But the 21st century space economy will be driven largely by entrepreneurs taking risks to discover potential scientific and mineral riches on other planets and asteroids.

"The inner solar system economy will be about private entrepreneurs finding ways they can go out and make a profit out in space," said 4Frontiers Corp.'s cofounder, Joseph Palaia. "These are passionate individuals driven by dreams, and investing their own money."

The interns see the potential to build science or business careers and to be part of a new, lucrative era in space exploration led by the private sector. Space tourism, exploration, and mining will demand a wide range of scientific experts, and may yield surprising discoveries in fields such as medicine, energy, and cosmology, Granzella suggested.

"I've always been a big space exploration fan," said another Mars Gravity intern, Nicholas Granzella. "And this is going to fulfill my desire to combine my own interests in technical and psychological research."

Granzella received his undergraduate degree this spring from Pepperdine University in physiological psychology, with a minor in computer science. He got the Mars Gravity internship based on his experience at Pepperdine working with rats, he said. Granzella is fine working this summer in his unsalaried job, which he hopes will lead to some published research papers.

``I've seen more in my first week than I ever imagined I would," he said.

Many of the Mars Gravity interns plan to work straight through the summer, designing payload bus and propulsion systems, onboard environmental controls, and the feeding and monitoring systems that will keep the mice alive until they return to Earth.

Most of the interns already have the design and scientific skills they will need on the job, said the program's science director, Erika Wagner, a Ph D candidate at MIT.

The program is funded in part by NASA, the Massachusetts Space Grant Consortium (which includes [Boeing](#), [Raytheon](#), and other companies) and other universities that are contributing expertise. Mars Gravity relies heavily on its summer interns, who are selected from universities around the world.

``The interns have been a very valuable resource," said Wagner. ``We probably get considerably more accomplished during the summer than at other times." ■

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