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Friday, July 21, 2006

Rocket Company Proves a Big Boost for Guanacaste

By Ralph Nicholson

Dr Franklin Chang, retired NASA astronaut and because of it a Costa Rican national hero, is today also the country's favorite son.

If there was any doubt, those were quickly dispelled last weekend at the Earth University's new campus outside Liberia.

With what seemed to be nothing more than a click of his fingers, Dr Chang gathered together for one afternoon only, arguable the greatest brains trust this country has ever seen. Certainly under the one, plastic-covered marquis.

There was, of course, Dr Óscar Arias, President of the republic and a Nobel Prize winner. He was one of two Nobel Prize recipients. If you count Dr Chang's own seven flights into space, there were also at least two astronauts. There were rocket scientists and rocket fuel experts, people who know about super conductivity and how to build the World's most advanced magnets.

Scientists specializing in experimental physics and others who prefer theoretical physics and three senior officials of the National Aeronautics and Space Administration (NASA) at the Lyndon B. Johnson Space Center in Houston, Texas. Men and women who are experts in radio frequencies and antenna design, as well as those who build solar panels to power things like the International Space Station (ISS).

And lawyers who know how to raise money to pay for such things.

All had come together with one common cause --- inter-planetary travel. Very fast, inter-planetary travel.

About 150 invited guests --- from the United States, China, the former Soviet Union, Switzerland, Ireland, Australia and Sweden --- for the inauguration of Ad Astra Rocket Company's new, high-tech facility on the campus of the EARTH University in Liberia.

Dr Chang, who heads the company headquartered at the Johnson Space Center, wants to develop an electric rocket propulsion system which can send astronauts to places like Mars in just 39 days as opposed to the two years it takes to go one-way on top of today's chemical rockets.

The propulsion system, called the Variable Specific Impulse Magnetoplasma Rocket (VASIMIR), will use super-heated hydrogen, contained by powerful magnetic fields, to push the spaceship away from Earth and into space.

© Zoraida Diaz



The hydrogen would be heated to temperatures up to a million degrees Celsius into a plasma state. Plasma physics are already familiar in television and computer screens, as well as natural phenomena such as lighting.



To loud applause, Dr Chang told the audience the Ad Astra Rocket Company in Costa Rica was bringing a piece of the future to Guanacaste.

Dr Franklin Chang Diaz and daughters (from left) Miranda, Lidia and Jeannie on the rooftop of the Liberia Space Lab.

“But we are not going to be an ivory tower, there are no secrets here,” he said.

“The facility is designed so you can see everything we are doing. It has been designed so kids can come into the building and see the firing of the plasma.”

White elephant, no, but great white hope, possibly.

The facility is unlikely to provide massive employment --- when fully operational the building will probably house about 25 scientists and technicians --- but Dr Chang says they will help stimulate other businesses in the area.

“Not all the work will be done in this facility,” said the former astronaut, who has spent a total of 1600 hours in space.

“We want to establish strategic partnerships with businesses in the area, which can help us with equipment and components,” said Dr Chang. “We will be looking for companies that can provide ceramic insulators, people who are skilled in precision welding and electronics and those that can work with different metals.

“The conditions here are right for what we are doing,” he added. “The airport provides rapid transportation for people coming and going from different parts of the world.”

While the plasma technology to propel rockets into deep space may be the stuff of dreams, it has some very current, very practical applications here on earth.

The company has a mandate, for example, to use the technology to develop a system for efficient waste disposal.

“When you burn waste in an incinerator the temperatures are not hot enough to break down the molecules,” says Timothy W. Glover, Director of Development for Ad Astra in Texas.

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“But with plasma technology, at temperatures of 10,000 degrees centigrade, it breaks everything down,” Mr Glover said. “You are left with a thin, glassy, black waste at the bottom of the oven. The high temperatures break down the molecules to their basic elements.”

NOBLE EFFORT: Dr Samuel C.C. Ting, winner of the 1976 Nobel Prize in Physics (left) with Dr Oscar Arias, winner of the 1987 Nobel Peace Prize. They are joined by the former Director of the Soviet Space Program Roald Sagdeev, for a ceremony marking the inauguration of the Ad Astra Space Lab.

Mr Glover said waste disposal was one of the proposed activities of the company, which in the first instance would look at using the technology to destroy hospital waste.

Ad Astra and its partners will also look at the more widespread use of solar power in Costa Rica. The company is working with Entech, Inc, the Texas-based supplier of both terrestrial and space-based solar arrays, to build a solar energy farm on the Earth University campus.

About 100 panels will be set up over about an acre (4000 square meters) generating 100 kilowatts of power, but longer terms plans include how solar power could be more widely introduced in a country with no shortage of sunlight.

Entech, one of the World's leaders in solar power technology, uses relatively cheap, specially-designed lenses to capture sunlight and focus it onto small solar cells, reducing some of the costs of conventional, flat-plate, solar energy technology.

Entech President, Mark O'Neill, said his company was also looking to build and assemble the solar panel components in Guanacaste.

"We have a partner in Texas which says it has had a lot of success building various components in Costa Rica," said Mr O'Neill.

Dr Chang wants a prototype of the new rocket ready as early as the end of 2007. The budget for the project is about \$150 million, much of which still has to be raised.

And just as he got together a room-full of some of the World's great brains, he expects to overcome any difficulties they may have with financing.

"I am sure there will be difficulties with investment along the way," he says, "but I would not be here doing this if I did not think we could raise the money."



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