Edgar Lara-Curzio

Oak Ridge National Laboratory

Programs 20-25

1. SHINING STAR

Edgar Lara-Curzio is one of the most brilliant scientists at the Oak Ridge National Laboratory. His history, like that of all stars, is linked to infinite space.

> Edgar Lara-Curzio
> I grew up dreaming about going to outer space, I was always fascinated by outer space.

His dreams are not far from becoming a reality. Lara-Curzio has been linked to various NASA projects.

> Edgar Lara-Curzio
> I had the opportunity to enter a hangar where there were parts of the Space Shuttle Columbia. I saw the pieces, I inspected the pieces.

Edgar Lara-Curzio, an indefatigable scientist, a man who believes that sooner or later he will reach the stars.

> Edgar Lara-Curzio
> I have not lost hope that someday I could be an astronaut.

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2. DREAMS AND DANGERS

Edgar Lara-Curzio is an engineer at Oak Ridge National Laboratory who is part of the team designated by NASA to determine the causes of the accident of the Space Shuttle Columbia.

> Edgar Lara-Curzio
> We were able to analyze certain fracture patterns that indicated that the damage had begun in the front part of the wing on the shuttle.

What was the experience like?

> Edgar Lara-Curzio
> Very hard, because in that same building there was a room where the remains of the astronauts were.

Lara-Curzio knows that no one can guarantee that another tragedy will not occur, but his dreams have the colors of the stars.

> Edgar Lara-Curzio
> The shuttle rotates around the Earth at 17 thousand miles per hour, at that speed it rotates around the Earth every 90 minutes, and one can see the shadow between day and night; one dawn and one dusk is seen every 90 minutes…it's marvelous!

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3. A SPACE TRAGEDY

On the morning of the February 1, 2003, a few short minutes before completing its mission, the Space Shuttle Columbia exploded into pieces.

What happened? What caused one of the greatest tragedies in space history?

> Edgar Lara-Curzio
> We were able to analyze certain fracture patterns that indicated that the damage had begun in the front part of the wing on the shuttle.

That's Edgar Lara-Curzio, a brilliant scientist from the Oak Ridge National Laboratory, who has worked on several projects with NASA.

> Edgar Lara-Curzio
> A space shuttle is an incredibly complex machine; it is almost a technological miracle that a space shuttle is able to lift off. To see it makes tears fall from your eyes from the emotion of it.

But, could the tragedy of the Space Shuttle Columbia repeat itself?

> Edgar Lara-Curzio
> Unless there is a drastic change in the design, no one can guarantee that it not be repeated.

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4. A SPECIAL MISSION

There is a Mexican with the spirit of an explorer on the team of scientists that carry out the rigorous work at the Oak Ridge National Laboratory: Edgar Lara Curzio.

> Edgar Lara-Curzio
> Yes, I like to explore things, my mind has been trained to give explanations. Yes, it's because of the way I think that I get closer to problems and solutions. Yes, I'm an explorer.

Lara-Curzio is an international authority on thermomechanical behavior of ceramic fibers, like those that will be used in a new generation of gas turbines and nuclear reactors.

> Edgar Lara-Curzio
> There were moments when I realized that some of the things that I was doing no one had done before. In a universal scheme, they are very small things, but there is a certain sense of pride in working on things that no one has worked on before.

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5. THE FORCE THAT MOVES THE WORLD

Effectiveness, power, virtue to work: Energy! That's how the Spanish academy of language defines it. In colloquial words: The force that moves the world!

At the Oak Ridge National Laboratory, Mexican-born scientist Edgar Lara-Curzio looks for processes to improve efficiency in the conversion of energy.

> Edgar Lara-Curzio
> The idea is: How efficiently can we convert one kind of energy into another?

But, why would we want to raise the operating temperature of internal combustion machines?

> Edgar Lara-Curzio
> Because it's a way to increase efficiency! If a car goes 25 miles on a gallon of gasoline, how can we make it go 50 miles a gallon?"

And is that easy?

> Edgar Lara-Curzio
> No, it's not very easy; machines are made of metal, and when you raise the temperature they melt. The challenge is to make them out of ceramic materials that withstand combustion temperatures and resist friction and wear better than metals do.

Who would've thought that ceramic can withstand more than metal!

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6. THERMODYNAMICS

Every time that energy is converted for industrial or domestic uses, there is a certain quantity of contamination given off into the atmosphere. Edgar Lara-Curzio at Oak Ridge National Laboratory works to ensure that the conversion processes are efficient and have a minimal impact on the environment.

Specifically, this Mexican engineer researches thermodynamics.

> Edgar Lara-Curzio
> Thermodynamics says that in order to increase the efficiency of the conversion of energy we need to do it at higher temperatures.

The vast majority of energy we consume in the United States comes from non-renewable sources like petroleum. Lara-Curzio sees a future with new sources of energy and an improvement in the processes of energy conversion. That's why he and his colleagues are developing new materials that might be able to operate in an efficient and durable manner at extreme temperatures.

> Edgar Lara-Curzio
> This is the information that is going to permit us to design new gas turbines, new nuclear reactors and new diesel fuel cells that could operate on a continuous basis for many years.

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