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“Firm tries to mimic grand designs”

By Carla Bova
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Pax Scientific sees efficiency in nature.
PAX Scientific of San Rafael is a keen observer of nature.
Not content to just sit back and watch, PAX Scientific works to mimic efficiencies inherent in nature and apply them to the design of industrial equipment, a practice called biomimicry.

"Biomimicry is the art or science of looking to nature for solutions and creating either products or tools that emulate nature so that you do things better, more efficiently and create some benefit," said Santhanam "Slim" Shekar, PAX's executive vice president. Examples can be seen almost everywhere - the flight of a hummingbird, the temperature in an ant hill.

"Engineers and construction managers are looking at the way spiders create spider webs," Shekar said. "The strength of a spider web is incomparable to anything engineers do because it is so much better. “It is not only beautiful, it is strong, it is flexible."

Shekar spoke Thursday to about 75 people attending a business breakfast in San Rafael presented by the Marin Conservation League and the Environmental Education Council of Marin.

"The human heart has to work efficiently for 80 to 100 years. It is the most efficient pump known to man and yet hardly an engineer looks at the human heart to emulate the design for a pump," Shekar said. "We at PAX are doing this."

County Supervisor Charles McGlashan spoke at the event. He cited Janine Benyus, author of "Biomimicry," and her description of the "brilliance" of an orange peel being water-tight, fully biodegradable and strong.

"Her idea was, look at those things, and for the business innovators and designers out there, guess what, nature has a 5.98 billion year head start doing good R and D,"

McGlashan said. "So why don't we mentor with the master designer. “Looking at spider webs and orange peels and wood structures - things that fully break down and are easy and nontoxic to reuse - that is the art of biomimicry."

PAX Scientific, at 1615 Fifth Ave., was founded in 1997 by Jay Harman, who observed the movement of fluid - both gas and liquid - and applied it to improving air-handling equipment such as fans, blowers and heating, ventilation and air-conditioning systems. It has 22 employees.

"We are literally finding ourselves trying to develop products for over 300 applications," Shekar said. "We expect by the end of this year a couple of PAX technology fans will be going to products and air-conditioning equipment and things like refrigerators or compressor fans."

The resulting products, Shekar said, use less energy, make less noise and are more efficient.

The company's recently created subsidiary, PAX Water Technologies, has been testing a small impeller, or rotary blade, that can mix between one and five million gallons of drinking water on just 100 watts of electricity, which can be solar power.

"Drinking water quality is a huge problem not only in this country but around the world," Shekar said. "In this country, there is a mandate to put chemicals into drinking water to keep the quality of the drinking water high. What is the problem with that? As they dump these chemicals, they all go to the bottom."

PAX's product is a solution.

"Within a couple hours, it has started mixing millions of gallons at almost peanuts cost," Shekar said. "The industry is very excited about this. We expect PAX water technology to take off quite aggressively."

PAX is exploring the area of heat transfer and thermal management systems and their application to cooling household appliances and computer equipment.

"If you can come up with a heat sink and a fan combination that is more efficient, uses less energy and is quieter, then you are solving a real problem in the computer industry," Shekar said. "At PAX, we are creating the long-term impact that we think our technology can have not only for our markets and customers but in the world in general."

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