

Lab to Market

L.A.'s three prominent research universities send a range of products into the real world.

CALTECH, USC and UCLA researchers ponder big questions. How would you improve cancer treatment? Can solar power be produced more efficiently? Why can't X-rays be taken with smaller devices? And sometimes they come up with the answers. When that happens, the technology transfer offices at the colleges can then help them spin off their research into businesses that create jobs and progress. This special section details recent tech transfer projects, such as John Dabiri's wind turbines, described below.

What is it?

Dabiri: A 35-foot-tall, vertical axis wind turbine.

What was the idea that led to the creation of the technology?

Two independent innovations. The first was the discovery at Caltech that vertical axis wind turbines could be configured and spaced in such a manner to derive much more power per acre than was previously known to be possible. The second was to approach wind turbine design starting with a blank sheet of paper and no preconceived notions, asking how one could develop the most cost-effective wind turbine considering not only cost at time of installation but also long-term ownership costs.

What were the biggest challenges?

Looking forward, the chal-

lenge will be to ensure that the product is durable enough not to increase the long-term cost of ownership.

What has been the benefit of spinning the company out of a university?

From my perspective as a professor, the benefit has been having an outlet for implementing these technologies in the real world and getting feedback on the nonscientific constraints on the technology, e.g. cost.

How could it change society?

We could make wind cost-competitive with fossil fuels.

If you could go back in time what would you do differently?

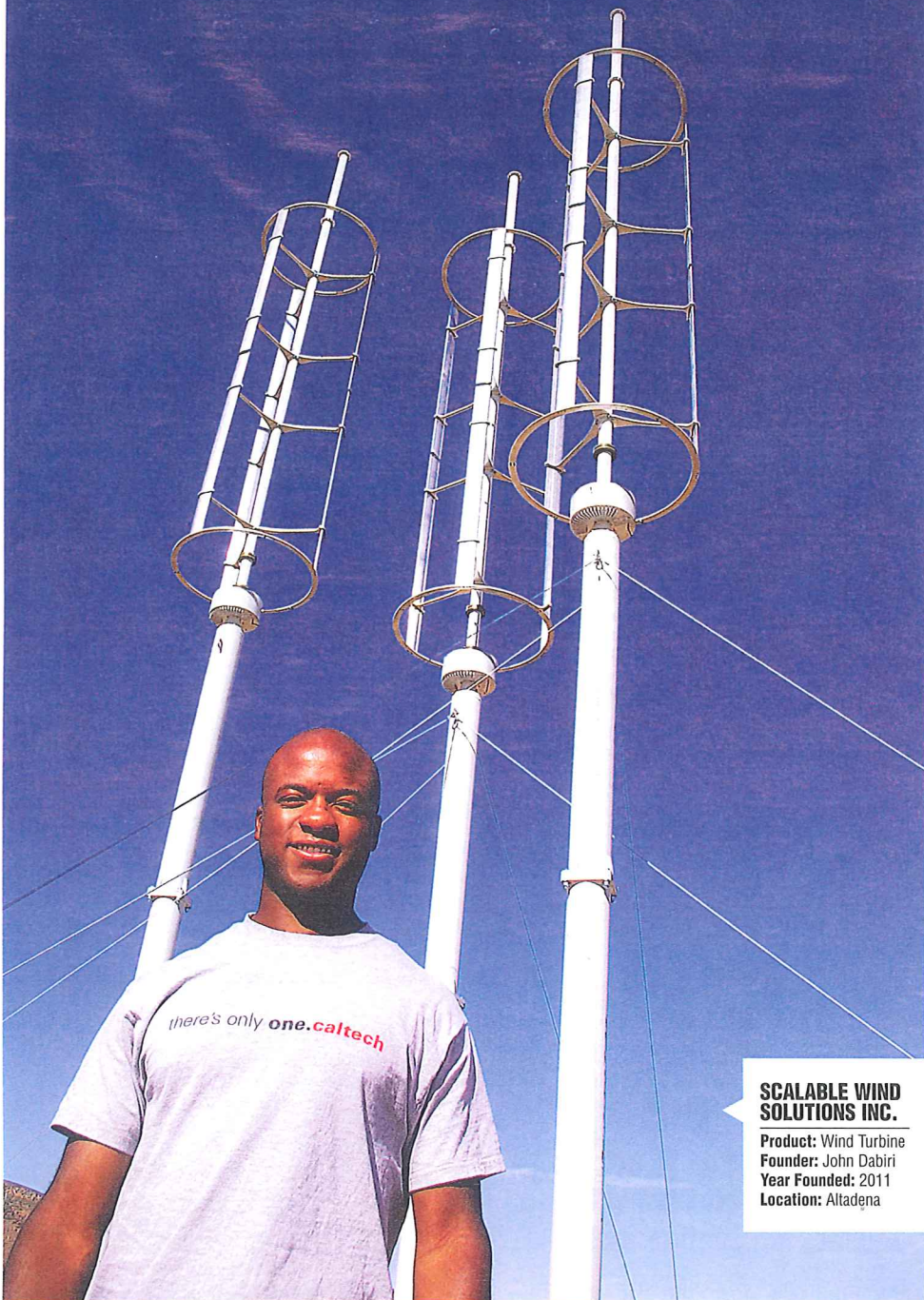
Nothing.

What's next?

The first turbine is operational. Ensuring quality control is paramount at this point.

SCALABLE WIND SOLUTIONS INC.

Product: Wind Turbine
Founder: John Dabiri
Year Founded: 2011
Location: Altadena



Innovation / Tech Transfer



Caltech: Scalable Wind Solutions Inc. (previous page) / Caelux Corp. | Materia | Glassimetal

Deferring Patent Costs

CALTECH's Office of Technology Transfer files more than 100 patent applications a year. Staff at the prestigious science school's tech transfer office realize that startup companies are often low on cash, said **Hannah Dvorak-Carbone**, associate director at the office. By deferring patent costs, for example, alumni can focus on fundraising and product promotion in the early stages of their companies' existence.

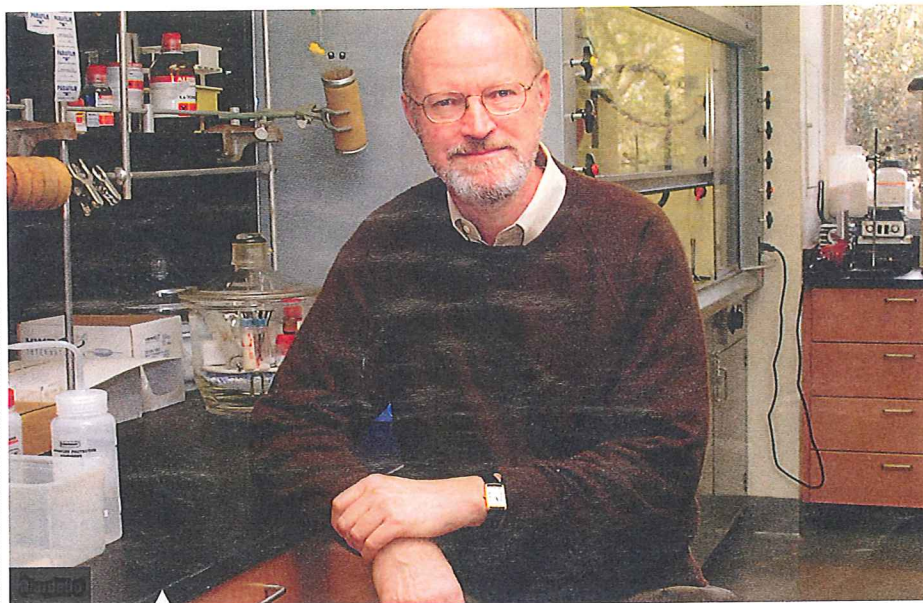
All types of companies come out of the university's research.

"Our startups are as diverse as our research on campus," said Dvorak-Carbone.

One example profiled here is **Glassimetal**, a recent Caltech startup, which makes a material combining glass and metal that is durable enough for use in aerospace, medical and consumer products.

The tech transfer office focuses on getting laboratory discoveries into the community at large.

"The notion is to try and get the technologies out of the university into a venue where they can actually be used for the benefit of the public," Dvorak-Carbone said.



CAELUX CORP.

Product: High-efficiency, thin-film solar cells
Chief Executive: John Iannelli
Year Founded: 2010
Location: Pasadena



What is it?

Iannelli: Caelux Corp. is commercializing solar-cell technology that uses a fraction of the silicon material found in conventional cells while achieving efficiencies well above current technologies.

What were the biggest challenges?

Like most early stage technology ventures, the biggest challenge is maintaining the right balance between innovation and commercialization. We conduct a large amount of research and have made quite a few significant discoveries in our field. However, the driving force of our business is to deliver a product to the solar market that provides economic benefits for both Caelux and the customer.

What was the benefit of starting at a university?

Universities can offer early stage companies the opportunity to initially refine their technology without building a large-scale and expensive facility. In the case of Caelux, Caltech was

the perfect starting point. It offered state-of-the-art laboratories for outside companies.

What's been the biggest change since spinning off?

We have grown from a few creative minds in an office into a company with regular strategy meetings, research planning sessions, IT and HR functions. We have built this structure without inhibiting the creative spirit of our employees.

How could it change society?

Our solar cell/module will have the performance and price point that should enable wide-scale adoption of solar technology.

What's next?

We are currently outfitting our own dedicated laboratory facility in Pasadena, which should allow us to perform research as well as low-scale production. Also, we will continue to recruit the best talent in the industry.

MATERIA

Product: Catalysts for use in materials from pharmaceuticals to composite plastics
Chief Executive: Michael Giardello
Year Founded: 1998
Location: Pasadena

What is it?

Giardello: A catalyst technology that has been developed over the past 35 years. This research served as the basis for the 2005 Nobel Prize in chemistry.

How did it get started?

The company was started off campus and licensed the technology from the university.

How could it change society?

There are new drugs going into phase three trials that are made possible using this technology. The catalysts are being used to convert seed oils into chemicals and fuels. New composites are being prepared using the catalyst for applications in the construction of wind turbines and other areas where strong, light structures are required.

If you could go back in time what would you do differently?

That is an impossible question.

What's next?

We continue to develop new versions of the catalyst and new applications.

GLASSIMETAL

Product: Technology for fabrication of precision parts from "bulk metallic glass" materials
Chief Technical Officer: David Lee
Year Founded: 2010
Location: Pasadena

What is it?

Lee: Glassimetal is dedicated to the use of bulk metallic glass (an alloy that combines desirable properties of metal and glass) as an engineering material for use in manufacturing of aerospace, medical and consumer products.

What was the idea that led to the creation of the technology?

The discovery and development of bulk metallic glass materials has been the subject of ongoing research in the Materials Science Department at Caltech for the past three decades.

How could it change society?

Metallic glasses offer a new paradigm for the use of metals in commercial hardware. These materials promise to simultaneously improve engineering performance while reducing the cost of manufacturing metal hardware.

What's next?

Glassimetal is partnering with several "end-user" companies in several fields — aerospace,



medical equipment, sporting goods, and other consumer products. The company is working with alloy suppliers and equipment builders. The business model involves patent licensing and joint development work with partner companies.

'The biggest challenge is maintaining the right balance between innovation and commercialization.' JOHN IANNELLI, CAELUX CORP.

