



Retina rover wins \$1M electronics award for UA researcher

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Wolfgang Fink grew up watching "Star Wars" and "Babylon Five."

Now the prolific, award-winning researcher is bringing technology inspired by tales of galaxies far, far away to the University of Arizona.

"I like science fiction," Fink said. "Some of it may be really far-out but, on the other hand, because of science fiction, boundaries have been pushed in the real world."

Coming from positions at NASA's Jet Propulsion Lab and the California Institute of Technology, Fink has been awarded the Edward and Maria Keonjian Distinguished Professorship in Microelectronics from the UA College of Engineering. A million-dollar endowment will fund his research.

Fink's work already is getting accolades. In November, he and his team of researchers working on artificial retinas were one of three groups awarded Research and Development Magazine's top award for Most Important Innovation of the year.

The team, led by Fink, created a rover that simulates the eyesight of the visually impaired. The rover tests artificial retinas Fink helps develop.

Fink "is a top-flight researcher," said Pete Brown, communications director for the UA College of Engineering. "He further consolidates the University of Arizona's position as a first-class research university."

At the UA, Fink is opening a Visual and Autonomous Exploration Systems Research Laboratory - a lab that encompasses every field that he researches. There are many of them.

He will also teach an in-depth class focusing on physics and computer methods beginning in August.

When not pushing the boundaries of science and technology, Fink indulges his wild array of hobbies.

As a classically trained pianist and certified helicopter pilot, Fink hopes to hold piano recitals benefitting local charities and rent helicopters from Tucson International Airport for flighty excursions.

He also is a proficient air-rifle shooter and enjoys rollerblading to stay in shape.

"He is a very interesting guy," Brown said. "He does not fit into the mold of the crusty old professor with the leather elbow patches."

The 41-year-old Fink was born and raised in Germany, where he earned a number of degrees including a Ph.D. in theoretical physics.

In 1998 he moved to the U.S. and has spent the last 10 years as a researcher for NASA's Jet Propulsion Laboratory and a visiting associate in physics at CalTech.

He focuses on three areas of research: biomedical, autonomous planetary exploration and computer optimization.

The award-winning rover that tests artificial retinas grew from his research in the biomedical field. The rover is called Ciclops.

An artificial retina is applied to Ciclops, then the rover is given simple tasks such as finding a door in a hallway or avoiding obstacles.

This process allows the retina to be tested without using a human subject.

Some manifestation of the rover could be an integral part of Fink's autonomous planetary exploration research. Fink envisions an army of independently controlled machines deployed to study a planet.

At the top of the chain, an orbiter would circle the planet scanning the surface.

The satellite would command an armada of air ships hovering above the planet that could deploy self-navigating rovers, similar to Ciclops, to further explore specific spots.

These machines would navigate autonomously and communicate with one another to achieve their exploratory objectives.

A planet could be crawling with this "smart" armada without a human lifting a finger.

All of these machines could potentially benefit from a program Fink is creating to optimize computer devices, processes and systems.

"I'm not just focusing on one aspect and ignoring everything else," Fink said. "A lot of people try to solve one particular subset of problems instead of trying to get the whole story going from A to Z."

Fink will bring this same comprehensive philosophy to his class and research lab at UA.

"All the students will be working on several aspects, but hopefully they will be working in a way that they will all be working together and seeing the greater vision and seeing how they are embedded in the greater vision," he said.

Fink, whose many passions seem to mirror his research approach, says Tucson is a good fit for him.

"It's an artistic-type town. There is a lot of art and, of course, science going on," Fink said. "I think it could be a very fruitful area for recitals or exhibits; it's a very eclectic kind of town."

With all of his extraordinary achievements, Fink manages to keep his head out of the stars.

"Ultimately, what's most important is to stay grounded," he said. "That's my honest belief. Once you take off you lose touch with yourself."

To that end, Fink readily admits to a shortcoming amid all his success: his golf game. "I have my set of clubs," he said. "But I still need some improvement."