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Mathematician Is Chosen for 'Genius' Grant

By Thomas H. Maugh II
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A UCLA mathematician sometimes called the "Mozart of Math," a Stanford University aviation engineer using abstract mathematical principles to help prevent airborne collisions, a San Francisco entrepreneur developing affordable drugs for neglected diseases in Third World countries and a Palo Alto engineer helping the blind read are among the 25 winners of this year's MacArthur Foundation "genius" grants.

Each winner will receive \$500,000 over five years to use as they see fit.

Terence Tao, 31, achieved a remarkable double with the MacArthur award. Last month, he also received the Fields Medal, the top international prize awarded to mathematicians. The medal is often called the mathematics equivalent of the Nobel Prize.

The Fields citation said Tao was "a supreme problem-solver whose spectacular work has had an impact across several mathematical areas."

A child prodigy, Tao began taking courses at Flinders University in his native Australia at age 9, graduating with a bachelor's degree with honors at 16.

Along the way, he participated in the International Mathematical Olympiads at ages 10, 11 and 12, winning bronze, silver and gold medals, respectively.

He received a master's degree from Flinders at 17 and a doctorate from Princeton University at 21. Upon graduation, he joined the faculty at UCLA, becoming a full professor at 24.

"Terry is like Mozart; mathematics just flows out of him," said UCLA mathematician John Garnett. "He's probably the best mathematician in the world now."

Tao said he was "very surprised" by the award. "I knew about the MacArthurs, but I didn't connect them to mathematics."

He doesn't yet know what he will do with the money, but "it should be very useful," he said. He will probably use it to travel to conferences, buy books and so forth, he said. "Mathematicians are fairly cheap" to support, he added.

Victoria Hale, 45, is founder and chief executive of the Institute for OneWorld Health in San Francisco.

The nonprofit group acquires donated rights to promising compounds that have either been deemed unprofitable by the pharmaceutical industry or left undeveloped by research labs unable to obtain funding.

Last week, the foundation announced that it had received approval from the Indian government to begin distributing an antibiotic called paromomycin to combat leishmaniasis, the second-most deadly parasitic disease in the world after malaria.

A recent clinical trial of the drug showed that a 21-day course of treatment — costing about \$10 — cured 94.6% of patients. The only other treatment for the disease costs about \$100, out of reach for most patients in developing countries.

The foundation is also developing drugs for malaria, Chagas' disease and diarrheal diseases.

"What incredible opportunities this sets out in front of you," Hale said about the grant. The funds will enable the foundation to reach out to "other visionaries and leaders to talk about how we can have the most impact" in developing other drugs.

Claire Tomlin, 37, does mathematical modeling of control systems to prevent planes in flight from running into each other.

Working with NASA and the Federal Aviation Administration, she and her colleagues are devising computer systems that would run in the cockpit or in control towers to warn when collisions are imminent and to suggest evasive action. Ultimately, the systems would perform autonomously, initiating the evasive maneuvers on their own.

The team has tested the systems in robotic aircraft and in military planes, but it will be "at least 10 to 15 years" before they can be validated enough to be used in commercial aircraft, she said.

The same models can be used with biological systems, and Tomlin spends about 20% of her time working with biologists who are trying to determine the structure of protein regulatory networks.

Tomlin said she has a sabbatical coming up and would probably use some of the money to go back to school and study biology. "I would absolutely love to do that," she said.

James R. Fruchterman, 47, is an electrical engineer turned entrepreneur who develops inexpensive reading devices for the visually impaired.

As a student, he developed a reading machine using optical character recognition technology developed for the military. He founded a nonprofit company called Arkenstone to develop and manufacture the system. He has also developed a scanning program that reads books and bills, a talking map reader and a talking global positioning device.

His latest group, the nonprofit Benetech Initiative, has created a Web-based library of scanned books for use by those with reading disabilities. Other projects include the development of landmine detectors and systems for safe storage of information about human rights violations. Fruchterman could not be reached for comment.

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(INFOBOX BELOW)

MacArthur honorees

The 25 fellows announced today by the MacArthur Foundation will receive \$500,000 apiece over five years.

The 21 winners outside of California are:

- **David Carroll**, 64, Warner, N.H.; a naturalist author and illustrator.
- **Regina Carter**, 40, New York City; a jazz violinist.
- **Kenneth Catania**, 40, Nashville; a comparative neurobiologist at Vanderbilt University investigating the nervous systems of unusual animals.
- **Lisa Curran**, 45, New Haven, Conn.; a tropical forester at Yale University studying deforestation in endangered areas.
- **Kevin Eggan**, 32, Cambridge, Mass.; a developmental biologist at Harvard University working on the use of therapeutic stem cells for human diseases.
- **Atul Gawande**, 40, Boston; a surgeon at Brigham and Women's Hospital who writes about medicine for the New England Journal of Medicine and the New Yorker.
- **Linda Griffith**, 46, Cambridge; a bioengineer at MIT developing artificial skeletons on which prosthetic organs can be grown.
- **Adrian LeBlanc**, 42, New York City; a narrative journalist.
- **David Macaulay**, 59, Norwich, Vt.; an author and illustrator of architecture and engineering.
- **Josia McElheny**, 39, New York City; a glass sculptor.
- **D. Holmes Martin**, 55, Strasburg, Pa.; a country doctor and research scientist studying rare genetic diseases among Amish and Mennonite children.
- **John A. Rich**, 46, Philadelphia; a physician designing new systems for bringing healthcare to underserved African American men.
- **Jennifer Richeson**, 34, Evanston, Ill.; a social psychologist examining the consequences of racial prejudice and stereotyping.
- **Sarah Ruhl**, 32, New York City; a playwright.
- **George Sanders**, 47, Syracuse, N.Y.; a short-story writer.
- **Anna Schuleit**, 32, New York City; a commemorative artist illuminating life in mental institutions.
- **Shahzia Sikander**, 37, New York City; a painter merging the traditional South Asian art of miniature painting with contemporary forms.
- **Luis von Ahn**, 28, Pittsburgh; a computer scientist working on cryptography and artificial intelligence.
- **Edith Widder**, 55, Fort Pierce, Fla.; a deep-sea explorer.
- **Matias Zaldarriaga**, 35, Cambridge; a Harvard University cosmologist studying the early history of the universe.
- **John Zorn**, 53, New York City; a musician and composer.

Source: The MacArthur Foundation

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