



## A Cast of Thousands

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JOSE IZQUIERDO

**Jose Izquierdo is not** a medical researcher, but he contributes to studies that one day could provide cures for Alzheimer’s disease, cancer, malaria, and HIV/AIDS. Izquierdo, a retiree in Ponce, Puerto Rico, is one of the more than 75,000 “armchair scientists” involved in a project called Rosetta@home, led by HHMI investigator David Baker at the University of Washington, Seattle. Rosetta enlists ordinary people who, whether sitting at their computers or not, allow their machines’ otherwise-dormant processing power to help predict the three-dimensional shapes of proteins—keystone to understanding disease and designing targeted drugs.

When Izquierdo became involved, he was physically ill and suffering from severe depression. “My spirit was ready to give up,” he says. “Then I realized

that my little computer could join me with so many people who were really doing something.” Now he devotes as much passion to conducting his piece of the research as he gives to cultivating award-winning orchids—Izquierdo once transported a single cut flower in a Samsonite from his Puerto Rico home to a competition in Philadelphia.

Rosetta relies on “distributed computing,” a process that takes a massive calculation and breaks it into chunks to be sent across the Internet and processed by home computers worldwide. While the Izquierdo “lab” crunches numbers, the computer of Thomas Dooley, for instance, way up in Alaska, does likewise. Kathryn Marks’s computer ran Rosetta virtually full time while she was teaching English in South Korea. Also not a white-coat type, she would “check in” every evening while in her “jammies, listening to country music.”

Participants are organized into far-flung teams, and Izquierdo is the statistician of his team, meaning he keeps track of “credits” earned by each volunteer. The team, called Xtreme-Systems, is one of Rosetta’s highest performers. Its 500-plus members worldwide include “grandmothers, kids, rich people, poor people, Ph.D.s, and high school dropouts,” says Izquierdo.

Volunteers pride themselves on their team’s clever monikers, such as Dutch Power Cows, The Knights Who Say Ni!, and The Final Front Ear. Some even name their computers, with “Clark Kent” reputed to be the most powerful machine.

Rosetta participants admit to being both obsessive and competitive. “Credits essentially have no value except for bragging rights, which do happen to motivate a lot of people,” says volunteer Mark Pottorff. Some participants “crunch” nonstop, and several have invested in auxiliary machines just to contribute to the cause.

Darin Steffl, a Minnesota high school student who runs his own computer

## Dreams About Science and Hoops in America



business, uses seven PCs for Rosetta. “Most people’s computers are just sitting there doing nothing,” he says. “Why not have it do something useful?” Taking that notion even further, one Team XtremeSystems member in Hong Kong devotes hundreds of computers from his business to running Rosetta full time. “We call it ‘The Farm,’” Izquierdo says.

Many volunteers were drawn to Baker’s program by the loss of a loved one. Marc Abrams, a businessman from New York, explains, “My mother died of cancer when I was 18, and my wife died of melanoma five years ago. This is a way for me to help solve the mysteries of those diseases.”

No matter what motivates Rosetta volunteers, almost all of them cite their camaraderie with other participants as a main attraction. Many chat with one another on a daily basis, using the Rosetta message boards. “But we are not nerds,” Izquierdo maintains. “We trade barbs and jokes. We can discuss anything from how to improve the computer to how to make an easy-bake cake.”

They also cite Baker’s accessibility as a factor that drives their zeal. “Dr. Baker and his team take the time to explain what they’re doing. Even if you don’t always understand the science, you’re made to feel like part of a family,” says Izquierdo. “When David Baker calls for help, it will come, because people have such loyalty toward him. He’s kind of like a cult figure.” —*Lindsay Moran*

**Growing up in East Germany** when it was still a stalwart of the Communist bloc, Dorothee Kern was an outstanding student with a passion for science. But what she really had going for her was a talent for sports.

The government was strenuously trying to identify potential athletic superstars who could put this small nation on the map. “The officials went to all the schools,” says Kern, now a biochemist at Brandeis University and a newly minted HHMI investigator. “In second and third grade they measured your fingers and toes, asked how tall your parents were. They were trying to see how the genes fell and look for athletic talents.”

Young swimmers, track and field athletes, gymnasts, and others with Olympic potential were intensively trained in special schools—almost to the exclusion of academic studies. And as became well known after German reunification, many were given steroids, growth hormones, and other performance-enhancing drugs, with often-tragic medical consequences. “You were not a free person,” says Kern.

When she was in fifth grade, Kern was chosen for a special sports school in swimming. But her father, wary of a perilous future for his daughter, said no. Instead, she chose basketball, also one of her early loves. “Basketball wasn’t an Olympic sport for East German athletes, so I could go to a top academic school instead and wasn’t pressured to take drugs.”

By the age of 12, Kern was playing on the junior national team—her entry ticket for high school. Despite receiving top scores in middle school, Kern was not nominated for high school because her family was not “in line” with the communistic society. However, playing on the national team was her way to “support” the country, opening the door to high school followed by college at the Martin-Luther University in Halle.

Sports continued to be a major part of her school life during her biochemistry studies at the university, where Kern juggled academic work with travels for the basketball team. She persisted in her studies and sport alike, ultimately earning a Ph.D. and captaining the German national basketball team for 8 years.

Nevertheless, the repressive government and hidebound structure of the East German science establishment rankled her, as they did so many of her colleagues. It was good-bye to all that when the Wall came down in 1989. “That was big,” she says. “You could take your life in your own hands, go to another country, have freedom of speech.”

When the opportunity came up, she quit pro basketball and accepted a post-doctoral fellowship at the University of California, Berkeley, where she loved the scientific environment and the scrappy style of American pickup basketball. In 1998, she moved to Waltham, Massachusetts, just outside Boston, to take a tenured position at Brandeis. Her husband is a scientist at a major pharmaceutical company, and her daughters, who attend Waltham public schools, are outdoorsy and athletic and want to become scientists. On a recent summer day, they bounced into Kern’s office ready to play basketball with mom on her lunch hour.

“One of the best things in life is to have big dreams,” she says reflectively. “Mine was to become a professor in science, to have a family, to play basketball, and live in America. And it has all come true.” —*Richard Saltus*

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FOR MORE INFORMATION: To learn more about Rosetta@home, visit <http://boinc.bakerlab.org/rosetta/>.

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