



**Thu Le graduated this spring.**

## *Out of Africa*

Senior Thu Le took the Summer Undergraduate Research Fellowship (SURF) program to the University of Durban-Westville (UDW) in Durban, South Africa last summer. Le's project, sponsored by Professor of Geography Ned Munger, was to set up a similar program in the lab of Mario Ariatti, a biochemistry professor at UDW. Like its progenitor, the program puts undergrads in a real laboratory doing real research fulltime over the summer.

The program is designed to get black students interested in science, in hopes that they will pursue advanced degrees.

Students in South Africa earn their bachelor's degree in three years. The student then has the option of a fourth year of independent study leading to a so-called "honors" degree, which in turn is a springboard to masters and PhD programs. But few blacks stay for the honors degree. "The black students' goal is to get out and find jobs that will help their families," explains Le. "They can't afford to stay too long. We need to help them get motivated. I was setting an example. So I designed this research project, and set it up, and some honors students will pick it up. There are two or three of them tentatively signed up for next year."

(Le certainly sets an example of motivation. Her family fled Vietnam in an open boat when she was 12. They were

eventually picked up by an Italian freighter, and lived in Italy for three years before moving to California. She graduated at the top of her class at San Jose High, having mastered English and Italian along the way.)

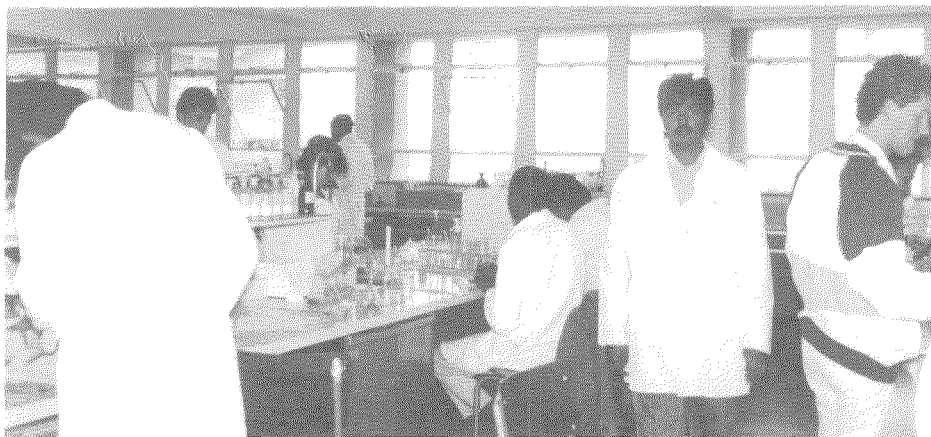
Le's project explores one facet of the process through which genes in cells are turned on and off. When a piece of DNA is heavily methylated—its surface studded with methyl groups—the gene it encodes is quiescent. As the methyl groups are removed, the gene becomes active. An enzyme called DNA methyltransferase sticks the methyl groups onto the DNA and plucks them off. The research studies how methyltransferase binds to DNA, and how the binding process might be controlled. The ability to control binding at specific sites, and hence to turn genes on and off, would have implications ranging from curing some genetically based diseases to breeding tomatoes that stay ripe longer.

"I got a couple of projects started," she says, "but it was pretty slow because there's hardly any equipment or anything available there. We used radioactively labeled DNA, and you need a scintillation counter to track it. Durban-Westville didn't have one, so we had to use the local blood bank's, and they would only let us use it one day a week. And we had to make the DNA samples, too. Over here, you can do it

on a machine. But we had to do it all by hand, which was good, in a way, because I learned how to do things I wouldn't have had to do at Caltech."

The UDW began as an all-Indian university—Natal province has a large Indian population, imported in the last century to work the sugar plantations—but went multiracial a few years ago. It is now about 75 percent Indian and 25 percent Black, with perhaps one or two percent whites—primarily the more liberal sort, who attend to make a statement. Le, who lived in one of the women's dorms during her stay—there are no coed dorms—was the only American (and the only Oriental) on campus. "The students were really friendly," says Le. "They look up to this country, but they hate it too. Most of them are very socialist. I'd just become a U.S. citizen, and I'd never had to defend myself so much in my life."

There were two or three riots in the two months Le was on campus—black student groups versus each other, the Indian students, or the police in various combinations. "I think that's about average," Le says. "I always kept a low profile when the police came in, because I didn't want my visa canceled. The police came every night during cultural week. They tried to film a play to see who was there. The director told them they couldn't under copyright law, but



**The laboratory at UDW where Le set up her research project. Prospective honors students will carry on the work this summer.**

*Two other Caltechers will be in Africa this summer.*

the police said they had to under the emergency regulations, so it was canceled instead. This happens all the time." The one time they didn't show was the night a black group allied with the police threatened to raid the campus. "They never come when there's an Inkatha raid, except later to collect the survivors."

Durban, like most large South African cities, has a multiracial downtown. "You can go to most of the movie theaters and bars, but there's still a sort of segregation. You can go to a white dance club with black friends, but you don't really feel comfortable. And you see the juxtaposition of the First and Third Worlds. The three main streets are white shops, all set up like American shops. The side streets are mostly Indian shops, which look like the Mexican shops down in Tijuana. There's a lot of haggling, and the shop windows are crowded, with everything crammed up in them."

Le also got out of the city, where she found that multiracial facilities are still the exception rather than the rule. "An Indian friend and I went touring, and we had to call ahead to the motel to make sure they were multiracial. If they're not, you might have to drive another 100 miles to the next one."

In addition to visiting wildlife parks for her own enjoyment, Le visited sever-

al high schools and universities as part of her project. The black high schools get the leftovers of the educational budget. Some don't even have electricity. Many instructors aren't fluent in English, further handicapping potentially college-bound blacks, as English is the language of the universities. Indian students, who rank just below whites in the apartheid system, have better facilities and learn English from an early age.

Le didn't spend much time in Johannesburg, the most conservative part of South Africa, but she did visit Soweto. "When Witwatersrand University was built," she says, "it was a white university in a white suburb. When it first admitted black students in the early '80s they couldn't live on campus in a white area, so they had a dorm on the border of Soweto, and were bused in. It's about a 20-minute drive." (An integrated dorm has since been built on campus.) Sibusiso Sibisi, a black lecturer in chemistry who lives in the Soweto dorm, took her around. (Sibisi was at Caltech during 1987-88 as a visiting associate, working with Institute Professor of Chemistry, Emeritus, John Roberts.) "Most of the houses are tiny, tiny ones, and then next door there'd be a big garbage dump. A lot of the houses are government-built, and rented out. When I was there, there was a rent boycott, then a garbage boycott, and it was

a real mess. The garbage was literally up to your knees and it stank."

Le feels the best hope for peaceful change lies in U.S. aid to improve black education and sanctions on high-technology products such as computers, plus a fuel embargo. "The poor people won't suffer," she says, "because they don't have cars. But the rich will feel it."

Le, who graduated this spring, will be starting medical school at U.C. San Francisco this fall. She hopes the situation in South Africa will have improved by the time she's through, but even if it hasn't, "I'd love to go back. A lot of foreign doctors go there after training. There's lots of good experience, including diseases that have been wiped out in the First World. And they do need the help. At one black clinic I visited, there was a German doctor with two nurses, and he said in the first two hours they were open they had 200 patients waiting in line."

Two other Caltechers will be in Africa this summer. Samuel Clark, a freshman on a SURF grant, and Gary Bloomberg, a graduate student taking time off from applied mechanics, will be at the University of Namibia in Windhoek, teaching a math refresher course for black high-school science teachers. The three's air fares were paid by the Cape of Good Hope Foundation, of which Munger is president. □—DS