

# A Special Connection

Sandia and Bell Labs have found a unique way to get their people together.

BY HOLLY BIGELOW

"Sandia National Laboratories has been associated with AT&T for a long time, but until recently, we have not taken advantage of each other's strengths," says Kumar Patel, executive director, Research, Materials Science, Engineering and Academic Affairs at Bell Labs.

"What Sandia wants to maintain a special connection with AT&T as our parent by making sure that technology and information transfer takes place both ways between the two organizations," says Venky Narayanamurti, vice president of Research for Sandia, on leave from the Bell Labs Physics Division.

Patel and Narayanamurti agree that people, rather than journal articles, which can take months to reach publication, are the best media for technology transfer. "We realized that we should take advantage of every opportunity to get our people together. The question was how best to do that," Patel says.

Then last fall, Narayanamurti reminded Patel of a problem with new hires at Sandia. Even though they are on the payroll, until they get security clearances, they aren't allowed into the technical area and can't do any experiments. One of Sandia's recent hires was Peggy Walsh, a Ph.D. graduate from Stanford University in Palo Alto, Calif.

"When we found out that the type of problems Peggy would be working on at Sandia would be similar to those of Dave McCall's Chemical Research Laboratory in Murray Hill, the idea sort of gelled," Patel says. "We began to realize that it would make sense for her to wait here at Bell Labs, doing real research, rather than in the library back at school."

Andy Lovinger, head of the Polymer Chemistry Research Department, along with department members Frank Bovey and Fred Schilling, were already working on



Peggy Walsh, now at Sandia National Laboratories, studied polysilanes in the Polymer Chemistry Research Department while on loan from Sandia.

a collaboration with John Zeigler, who was to be Peggy's supervisor at Sandia. The details were arranged and Walsh arrived in Murray Hill last December to work with Lovinger, Bovey and Schilling on a new category of polymers, called polysilanes, which are based on silicon

instead of carbon. Polysilanes may prove their usefulness as a resist material for manufacturing integrated circuits.

"It was personally very difficult, moving somewhere strange where you don't know anyone," says Walsh. "After spending time in California, the weather in New Jersey was a shock, but I absolutely loved Bell Labs. The scientific contacts I made were invaluable for someone just coming out of school and I learned techniques that I never would have been exposed to if I'd gone directly to Sandia. For example, I learned about pressure effects on polysilanes from Rob Macgregor in the Biophysics Department, something we discovered while I was there. It was very broadening."

Walsh left Bell Labs when her clearance arrived in May. "The experience with Peggy was astounding," says Patel. "She came to us with fresh ways of looking at problems, which benefited us, and she went out of here all charged up with ideas for new experiments to perform back at Sandia."

By that time, the second exchange had begun when Wendell Jones of Sandia visited Bob Frankenthal in the Materials Reliability and Electrochemistry Research Department at Murray Hill. "Wendell

told us he had hired a new graduate, John Scully, who had accepted the job offer, but was staying at his previous position while waiting for his security clearance," says Frankenthal. "It was a good opportunity because we have a broad-ranging program in corrosion science, a subject that encompasses John's Sandia assignment."

Scully is now at Murray Hill, looking at ways to prevent tiny pits from forming in the aluminum metallization during processing of an integrated circuit. The pits could cause increasing problems in operating ICs as the feature sizes of these electronic devices are made smaller.

"It was a neat field to get into, since understanding pits this small is at the leading edge of corrosion science," says Scully, who recently finished his Ph.D. at The Johns Hopkins University while working at the Naval Ship Research and Development Center in Maryland. He and his wife Hazel moved to New Jersey in April after a one-week stint at Sandia. The Power Systems Division at Murray Hill hired Hazel as a casual employee for the few months they are to be in the area.

"It worked out perfectly," says Scully. "We'll be here through Christmas, and in January we'll move to Albuquerque, where we both have jobs waiting for us at Sandia. Meanwhile, I've met lots of people here who will be a tremendous resource in the future. When you have this sort of interactions, you know they're going to last."

"I've gotten to know many more people at Sandia, too, as a result of John's visit," says Frankenthal. "John's project generated much basic science that will be of value to both organizations. His interactions with other members of our department have also been of great value to everyone."

"This is a win-win situation where everybody comes out ahead," says Lovinger. "It helps the new employee, it helps us, and it helps Sandia, too. Sandia benefits by having people already on the payroll doing high quality research here at Bell Labs; we benefit from the person's work and by our interactions with Sandia; and the individual benefits by working on Bell Labs projects and initiating long-term collaborations."

"It is my expectation that as people come here and go back, we'll have greater connectivity, increasing closeness between the two organizations," says Patel, who is opening up another communication channel by starting a Sandia-Bell Labs seminar series. The first speaker from Sandia visited here in October.

Meanwhile, Narayanamurti will visit Bell Labs this month to help enhance the people exchange. "We have a small hiring program in place, and some of the new hires may want to come to Bell Labs while waiting for their clearances," he says. ■



Bob Frankenthal, left, of the Materials Reliability and Electrochemistry Research Department "borrowed" John Scully, an employee of Sandia, to study ways to prevent tiny pits from forming in the aluminum wires during processing of integrated circuits.