

# INTERNATIONAL Herald Tribune

## Wireless: The tin-can antenna offers a boon for third world

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WEDNESDAY, MARCH 1, 2006

**TRIESTE, Italy** A physics research institute here is using a low-cost but effective tool to bolster communications in developing countries: the tin-can antenna.

Made from a can (the best are those used for seed oil, their creators say), a screw-on connector and a short brass wire, the "cantenna" is promoted by researchers as a cheap and efficient tool to amplify access to information and communication technologies in some of the world's poorest and often most remote areas. Cantennas work like regular antennas but cost around €2, or \$2.40, to build, while those purchased in a store can cost several hundred euros. They are directional antennas and can be used for short- to medium-distance point-to-point links. They can also be used as feeders for parabolic dishes. That means that by aligning a series of cantennas, it is possible to receive signals from a distant receiver using one or more repeaters, which send, amplify and redirect radio waves, and send signals to remote areas.

"Bringing technology to the community is called the last mile," said **Sandro Radicella**, who heads the Aeronomy and Radiopropagation Laboratory at the Abdus Salam International Center for Theoretical Physics here. "But I like to call this a first-mile solution because the user is put first."

Since 1989, the radiocommunications unit at the lab has been working on technology to bring the third world into touch with the first, and in 1998 it shifted its focus to wireless networking, a rapidly growing market sector in the developing world. The school has attracted dozens of top engineers and scientists from emerging countries eager to learn low-cost techniques that will connect universities and hospitals, and eventually even remote villages, back home. The objective is not so much about letting the residents of a rural community in Rwanda catch the latest episode of "Desperate Housewives" as raising the level of scientific research in developing countries, say the cantenna's proponents.

"You train trainers, who train students, and it passes on to the villages," said **Ryszard Struzak** of the Institute of Telecommunications in Geneva and the other co-director of the school, which also promotes project-based field activities like wireless workshops in developing countries. The school is a natural offshoot of the International Center for Theoretical Physics, which was founded in Trieste in 1964 by Abdus Salam, a Pakistani who shared the Nobel Prize in 1979 for his work in particle physics, to advance scientific expertise in the developing world. In 40 years, more than 100,000 scientists have visited the center to conduct research or participate in training seminars.

"Most developing countries don't have an effective research base and individual scientists are isolated," **K.R. Sreenivasan**, director of the center, said in an interview in his office. "But if you help them stay connected, there's more of a chance they'll stay in their country," avoiding a so-called brain drain of educated talent elsewhere.

The 2006 wireless networking course, which had participants from more than a dozen countries, including Venezuela, Rwanda and Iran, ended on Friday. On Thursday, **Claro Noda**, a researcher from the University of Havana and a student at the lab, presented a case study that showed how he used the cantenna with a Wi-Fi device that permitted him to measure activity in ant colonies to create models. In a country where scientific research is poorly financed, he appreciated the cantenna's low cost.

"It's very cheap," he said, "and it works." The cantenna has been around for years, but in Trieste it was fine-tuned by **Rob Flickenger**, the co-founder of NoCat, a California-based wireless company that promotes open-source software. Flickenger has taught at the school for three years and collaborated with other instructors to write "Wireless Networking in the Developing World," a how-to manual published in January and available at no cost on the Internet. "We clear out the local supermarkets of the cheapest oil before each course begins," he said about the center's demand for seed oil cans. "And immediately afterward, the cafeteria starts serving a lot of fried food."