

SCIENCE IN THE NEWS

CELLPHONES TEAM UP TO MAKE WI-FI WHERE YOU WANT IT

Microsoft has built a system that knits together the internet connections of a collection of smartphones to create a high-speed wireless hotspot that computers can use when other connections aren't available.

The computers connect to the phones using short-range Wi-Fi, requesting web pages as if they were using a wireless router with a wired connection to the internet, and the cellphones use their long-range cellular connection to get the files requested from the net.

Crucially, the system, dubbed [Cool-Tether](#), coordinates the phones to send data in fewer, longer bursts, and to make sure that each "energy tail" is associated with as much data transfer as possible. Cool-Tether uses a quarter as much energy as the previous version of the system, with little loss of downloading speed.

[Srinivasan Keshav](#) of the University of Waterloo in Ontario, Canada, says Cool-Tether incorporates "some neat ideas, [including] burst transmission and a careful analysis of energy". However, it's not clear how practical it is today, he argues, because Wi-Fi-enabled cellphones are not yet that common.

For details see: [New Scientist](#).

AFRICAN INITIATIVE TRAINS STUDENTS, EXPLORES GEOPHYSICAL MYSTERIES

Earthquakes, volcanoes and the African superplume are only some of the phenomena under investigation through AfricaArray, a program that establishes geophysical observatories, trains African and American students and examines geophysical phenomena on the African continent.

The model, created by a trio of institutions – Penn State; University of the Witwatersrand, Johannesburg, S.A., and the Council for Geoscience (S.A.) – combines student education with establishment of a research program in geophysics; field schools attended by African and American students and corporate personnel, and a graduate exchange program.

The center of the program is the research that relies on data from a network of seismic observatories: 27 installed by AfricaArray, 6 that should be installed by the end of the year and 16 other seismic observatories. The program also employs temporary targeted networks of stations for specific, higher resolution problems and cur-

rently has networks in Angola, Botswana and Namibia exploring the Congo Craton; South African gold mines looking at small, deep seismic events, and in Uganda/Tanzania for imaging the African Superplume. Data from the stations is stored with the Incorporated Research Institutions for Seismology (IRIS), a university research consortium sponsored by the National Science Foundation.

So far, after three years, AfricaArray has supported 34 undergraduate, 13 masters and 10 doctoral students. They have also hosted five postdoctoral fellows. From the U.S. side, 12 students, half of them women, have participated in three-week geophysical summer programs to South Africa from North Carolina A&T State University; Fort Valley State University, Georgia; University of Texas, El Paso, and California State University, Northridge. Graduate students from Wits have also come to the U.S. to study under Penn State faculty co-advisors.

Plans for the future include expansion of seismic observatories into West Africa and eventually North Africa as well. They are currently working with two other African universities – Agostinho Neto in Angola and Addis Ababa University in Ethiopia – to include the program in their universities. The researchers would like to see installation of additional types of sensors and monitors including meteorological, environmental and geographic positioning system instruments, noting that once the infrastructure is there for the seismic observations, it is easier to collect data in other disciplines.

Map of Africa showing permanent seismic observatories associated with AfricaArray.

