

NRAO, WVU expand broadband data network to bolster astronomy research

April 10 2014, by Charles Blue



NRAO and WVU inaugurate broadband data network Credit: NRAO/AUI/NSF, WVU

(Phys.org) —Two of West Virginia's premier research institutions, the National Radio Astronomy Observatory (NRAO) in Green Bank and West Virginia University (WVU) in Morgantown, have inaugurated a new super high-speed broadband data network to bolster collaboration and scientific research between these two education-focused organizations.

The new system will be more than 200 times faster than NRAO's previous data link, allowing scientists and students to more effectively conduct research using one of the world's most powerful astronomical instruments, the Robert C. Byrd Green Bank Telescope (GBT).

"The Green Bank site is fairly remote, which makes it ideal for sensitive [radio astronomy](#) research," notes NRAO Site Director Karen O'Neil.

"Previously, this meant a tradeoff in our access to data and communications infrastructure; but no longer. By upgrading to one of the most advanced data networks available, we can ensure the world-class instruments and staff on site are readily accessible by students and researchers across West Virginia and around the world."

Fred King, WVU's vice president for research, said, "This new data pipeline will significantly improve the ability of researchers at WVU and from across the country to make the fullest possible use of the NRAO facility. A side benefit is the enhanced connectivity it provides to WVU communities along the way."

The technology behind this upgrade is a reconfigurable optical add-drop multiplexer (ROADM), a device that can nimbly transmit and receive signals of various wavelengths, greatly enhancing the speed with which information can be transmitted. Both NRAO and WVU will host data terminals, essentially the "on ramps" that are connected to an optical link that loops around the state. The network uses a combination of existing and newly installed optical fiber to carry the signal.

The new system will allow students and astronomers to conduct real-time observations and data reduction as well as better participate in research with other telescopes around the world. It also will expand the impact of NRAO's Pulsar Search Collaboratory (PSC), a project that provides high school students in West Virginia and elsewhere access to GBT data to search for new pulsars—rapidly spinning neutron stars.

The link will also allow researchers at WVU to take full advantage of an agreement reached last year with NRAO in which the University pledged \$1 million over two years to support personnel and operations costs associated with the GBT. This agreement reinforced the strong historical

collaboration between NRAO and WVU's researchers, faculty and students, and allows WVU 500 hours of time on the telescope.

The data link was funded through a Broadband Technology Opportunities Program (BTOP) grant to the State of West Virginia, the largest single BTOP award in the United States.

Each year, hundreds of astronomers from around the world apply for time on the GBT, which is the world's largest fully steerable radio telescope. Its location in the National Radio Quiet Zone and the West Virginia Radio Astronomy Zone protects the incredibly sensitive telescope from unwanted radio interference. It has been in full-scale scientific operation since 2002.

Provided by National Radio Astronomy Observatory

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