NJIT physicists expect new super lens to reveal first light by early 2006

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"This is an exciting time in all fields of astronomy because advances in technology enable us to build instruments that would have been only dreams a few years ago," said lead researcher Philip Goode, PhD, distinguished professor of physics at NJIT and director of Big Bear Solar Observatory (BBSO), California, where the telescope will be installed. NJIT has operated the facility since 1997.
Led by Goode, a team of solar physicists from the University of Hawaii and Korea are collaborating with NJIT on the project.

The NJIT team is replacing BBSO's existing 65-cm vacuum aperture telescope with a modern off-axis, open air, 1.6 meter clear aperture instrument. The new telescope uses visible and infrared light rays to measure simultaneously the Sun's magnetic field at different altitudes in the solar atmosphere to study the field's evolution.

What will be most unusual about the new telescope will be its ability to reconstruct and sharpen in real time the blurry images of the sun that telescopes now provide. "Sharpening these images will be a remarkable achievement because now no observatory does this and people need this information," said Goode. "After all, if you want to forecast space weather, you have to have sharp images now. It does no one any good to have sharp images two days after the solar event occurred." People working with satellites and power utilities, in telecommunications and for the military need this information."

This solar telescope is the centerpiece of the nation's multi-agency space

weather program, to better understand the interaction between magnetic fields and the flows of materials on the sun's surface. The new telescope will also allow researchers to study the dynamics of the sun's chromosphere. The chromosphere is the first layer of atmosphere above the sun's surface layer.

The new telescope will also allow Goode and his staff to continue their ground-breaking research about earthshine, the faint illumination of the dark part of the moon by sunlight reflected from the earth. In the May 28, 2004 issue of Science, Goode and his team argued that by observing earthshine for eight years, they had witnessed first a gradual decline in the earth's reflectance, which although it grew sharper in the late 1990s, reversed itself in the past three years. There seemed to be a decadal natural variability of the climate system, specifically clouds. The decreases in the planet's reflection of sunlight through the end of the last century may well be associated with the accelerated global warming in recent years, the researchers noted.

Other NJIT projects related to the space weather program include the work of NJIT Physics Professor Dale Gary, PhD, who is developing a global network of 100 radio telescopes. The telescopes will provide information about the sun's magnetic fields through radio waves.

Source: New Jersey Institute of Technology