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Yerkes Observatory initiates Astrophysics Academy for Young Scientists

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Students and teachers from 20 Wisconsin and Illinois schools will explore the universe with the Hubble Space Telescope and a variety of other research instruments as participants in the newly created Yerkes Observatory Astrophysics Academy for Young Scientists. Yerkes will formally launch the Academy with an astronomy festival for participants on Saturday, Jan. 20.

Forty teachers and 250 students in grades 3 to 8 will participate in the program, which the National Science Foundation is funding with an \$800,000 grant to the University of Chicago and Aurora University. The students, including some with visual and hearing impairments, will be expected to commit 150 hours to the Academy outside of school hours over two years. Their activities will include a weeklong summer camp hosted by Aurora University at the George Williams College Campus and Yerkes Observatory, field trips to Adler Planetarium and Museum in Chicago, and remote viewing of the night sky over Japan via the Tokyo Science Museum.

Yerkes Observatory Director Kyle Cudworth likened the time investment to the after-school commitment that many children devote to sports. "If you sign up for sports, you make a commitment at least for a season," said Cudworth, a Professor in Astronomy & Astrophysics at the University of Chicago.

The teachers, meanwhile, will receive professional development and be paid for their involvement in the program, much the way a coach would. Each school also will receive \$1,000 worth of telescopes and other equipment for their use in after-school club activities.

The Academy is an outgrowth of the Yerkes' (SEE) Space Exploration Experience project, which in recent years has introduced the world of astronomy to students at the Wisconsin Center for the Blind and Visually Impaired. "The exciting thing for all of us is being able to continue to work with the blind and visually impaired and to be able to add working with the deaf and hard of hearing," said Yerkes Education and Outreach Coordinator Vivian Hoette.

In this expanded format, the Academy will serve as a demonstration of how Yerkes could operate in the future as an education and outreach center as it evolves away from its long tradition of astronomical research, Cudworth said.

Teachers in the Academy will plan and propose a research project for the Hubble Space Telescope, then analyze the resulting data. "Our goal is to engage the teachers and students in all phases of real scientific research, to give them firsthand experience in the methods—and exhilaration—of exploring the universe," Cudworth said.

Assisting with the Academy will be Max Mutchler, a research astronomer with the Space Telescope Science Institute in Baltimore. Mutchler grew up in Racine, Wis., a relatively short distance from Yerkes Observatory in Williams Bay, Wis. "I look forward to the opportunity to help inspire area students to study science, technology, engineering and math—and give them a glimpse of how it can lead to an interesting and fulfilling career," Mutchler said.

Also involved in the Academy are Al Harper and Richard Kron, both of whom are Professors in Astronomy & Astrophysics at the University of Chicago. Kron is a member of the Sloan Digital Sky Survey collaboration, while Harper is a member of the SOFIA (Stratospheric Observatory for Infrared Astronomy) science team.

Related Photo:



The historic 40-inch refracting telescope at the University of Chicago's Yerkes Observatory. The telescope, which has been used for more than a century at Yerkes, is the world's largest refracting telescope, one that uses lenses rather than mirrors to collect light. The 40-inch refractor is one of the telescopes that will be used by participants in the new Astrophysics Academy for Young Scientists at the Yerkes Observatory.

Yerkes Observatory photo.

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“One thing that has been a hallmark of Yerkes education outreach has been the close working relationship of astronomers and educators,” Cudworth said.

The Academy will consist of four key components: observing the sky, investigating light and the electromagnetic spectrum, using telescopes, and building instruments.

Observing the sky. During this part of the program, Academy participants will learn how Earth’s rotation and its motion around the sun causes most of the changes they see in the sky during the night and across the seasons. “We want the kids to develop their observing skills and their inquiry skills,” Hoette said. “We’re not going to teach them what they’re seeing. We’re going to teach them how to look and how to record their observation.”

Investigating light. “While most participants in this program see visible light, there are other forms of electromagnetic radiation that are also light, but our eyes are just as blind to those as the blind students’ eyes are to visible light,” Cudworth said. “When we come to talking about the ultraviolet or infrared or X-rays or radio, we’re all blind. But these others forms of light can be detected, measured, and tell us a lot.”

Using telescopes. With telescopes at Yerkes and elsewhere, and tapping resources provided in connection with the Hubble Telescope and other astronomical observatories, students will do imaging, data collection and analysis. The students will have six nights of observing throughout the program.

Building instruments. During this phase of the program, students will build their own technology including cameras, telescopes, or special instruments that could be used independently or mounted on Yerkes telescopes to observe and collect real astronomical data.

The activities are all part of Yerkes’ efforts to engage a wider audience in the scientific adventure. They follow a philosophy once stated by Nobel laureate Riccardo Giacconi, the first director of the Hubble Space Telescope. Said Giacconi: “The dazzling discoveries by scientists remain curiously sterile unless they become assimilated in the general culture and become part of the intellectual heritage of mankind.”

A long list of organizations has joined Yerkes as partners in the program. They are the Geneva Lakes area schools and school districts, the teacher education programs at George Williams College of Aurora University, Wisconsin Center for the Blind and Visually Impaired, the National Federation for the Blind, the Wisconsin School for the Deaf, local business and civic associations, the Adler Planetarium and Museum, the Science Museum of Tokyo, the Hands-On Universe at Lawrence Hall of Science of the University of California, Berkeley, and the Astronomy Resources Connecting Schools teachers of the Illinois Mathematics and Science Partnership.

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