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Yale's Wright Laboratory says goodbye to bunker mentality

By Jim Shelton, New Haven Register

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NEW HAVEN >> Tandem Van de Graaf particle accelerator, we hardly knew ye.

In a complete rethinking of its approach to physics research, Yale University is embarking on a soup-to-nuts renovation of its iconic, underground bunker on Whitney Avenue. Part of that renovation, later this year, will include the unearthing of Yale's massive, blue-painted, nuclear atom smasher.

In its place, Yale will construct new classrooms and labs devoted to creating cutting-edge physics instrumentation. The university also plans to hold open houses so the public can get a closer look at the old accelerator before it gets the heave-ho.

"We want to turn this into a center for neutrino and dark matter research," said Yale physicist Karsten Heeger, director of the Wright Laboratory. "We want to be transparent, to engage with the community. We can use this as an opportunity to show people what happened here in the last 30 years."

To be sure, the former Wright Nuclear Structure Laboratory is a formidable place in both reality and reputation.

It was built in the 1960s and came to prominence through the leadership of director D. Allan Bromley, who later would head the Office of Science and Technology Policy for President George H.W. Bush. Thanks to the lab's centerpiece, a powerful particle accelerator, it became a nexus of national physics research.

Particle accelerators, commonly called atom smashers, shoot energized particles through a controlled beam. Those particles can be tailored and directed to specific experiments in adjacent labs.

In 1987, Yale installed its current atom smasher - a tandem Van de Graaf accelerator. The machine is roughly 100 feet long and takes up 14,000 square feet of floor space.

"At the time, it was the highest-energy, tandem accelerator in the world," Heeger said. "This facility helped develop the field of nuclear physics."

But as years passed, even more powerful machines went into use elsewhere and Yale's accelerator receded in importance. Yale eventually turned off the machine, in 2011.

“When Yale turned 300 (during the 2000-01 school year), we had between 1,500 and 2,000 people come through here to see the accelerator,” recalled Jeff Ashenfelter, associate director of operations and a 25-year veteran of the lab. “There was a great deal of interest from people in the neighborhood.”

More recently, during festivities for Yale President Peter Salovey’s inauguration, the university also gave tours of the lab.

What will be different about the upcoming open houses, once they are scheduled, is that visitors will get to go inside the machine. Insulating gas in the main tank will have been pumped out by then, and many of the surrounding crates of equipment, cables and other material will have found new homes at other research sites around the country.

The U.S. Department of Energy, which owns the accelerator, is helping to pay for its removal.

“We’re emptying this out and reclaiming the space,” Heeger said.

Plans for the new Wright Lab are evolving. Heeger said there will be integrated research and teaching facilities, machine shops and clean rooms in which the air quality, temperature and humidity are controlled.

Much of the new frontier in physics research is at remote sites. Yale has established scientific collaborations in a South Dakota mine, beneath a mountain in Italy and under the ice at the South Pole. That’s where scientists are searching out the neutral subatomic particles known as neutrinos and attempting to understand the hypothesized material called dark matter.

Heeger wants the new Wright Lab to be the place where instruments for those experiments are built and perfected. The entire project, including construction of the new labs, is expected to take at least three years.

“This really is the end of the accelerator era at Yale,” Ashenfelter said. “We’re excited about the new opportunities, but there’s some sadness, obviously, seeing the accelerator go. It had a good run.”

Call Jim Shelton at 203-789-5664. Have questions, feedback or ideas about our news coverage? Connect directly with the editors of the New Haven Register at AskTheRegister.com.
