of short-baseline liquid-argon time-projection experiments. The 170-ton MicroBoone, located 470 m from the source, will start later this year trying to untangle anomalies of Fermilab's earlier MiniBoone experiment (see PHYSICS TODAY, October 2010, page 14). The third, the Short-Baseline Near Detector (SBND), 110 m from the source, keeps tabs on the neutrino output. About $9 million for the ICARUS building was diverted from in-house liquid-argon research.

The ICARUS detector will look for sterile neutrinos, which are hard to pin down because—if they exist—they don't interact with matter. Over the past 15 years, says INFN vice president Antonio Masiero, "various experiments have had results that could not be accounted for by the presence of only three neutrino species. This is quite a puzzling thing."

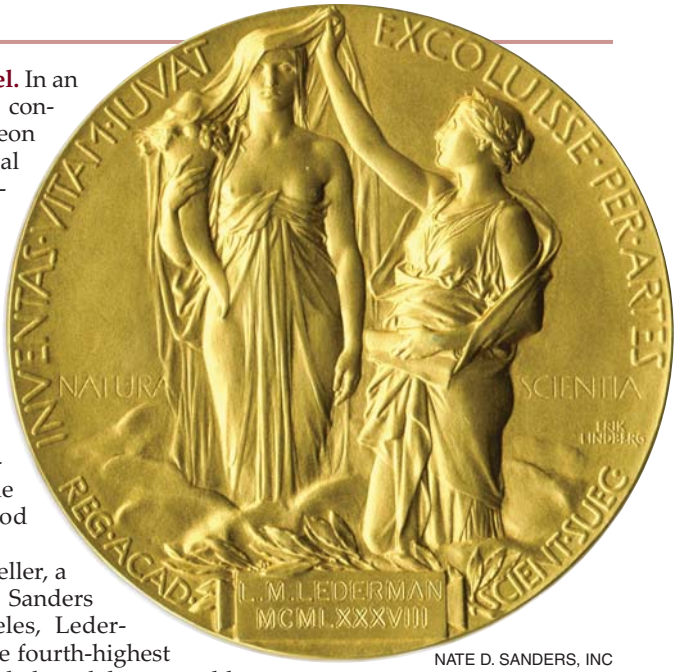
Measurements of the neutrino flavor distribution at the SBND will be used to predict the beam makeup at ICARUS. Either more electron neutrinos or fewer muon neutrinos than expected would point to new physics, says Peter Wilson, coordinator of Fermilab's short-baseline neutrino program. "One would then need to interpret the result to determine if this is a sterile neutrino or some other new physics." The key is ICARUS's large volume. Says Fermilab director Nigel Lockyer, "It's supposed to be an experiment to either find or rule out sterile neutrinos at the 5-sigma level. That's the gold standard now."

The anticipated 40-kiloton detector, previously known as the Long Baseline Neutrino Experiment, was renamed the Deep Underground Neutrino Experiment (DUNE) earlier this year when international partners joined. Located some 1300 km from Fermilab's neutrino source, DUNE will be used to study flavor oscillations. "It's going to be 7 to 10 years before science comes out of DUNE," says Wilson. "The short-baseline experiments provide an opportunity for people to do science on shorter time scales and to develop students and junior scientists. ICARUS and the other short-baseline experiments will give input for understanding observations at DUNE."

Scientists from about 40 institutions in the US and Europe are involved in Fermilab's short-baseline neutrino program. Says Wilson, "Everyone who is working on this is [also] aiming to do physics with DUNE." So far, the DUNE collaboration involves about 750 scientists from 145 institutions in 23 countries.

Toni Feder

news notes



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Lederman sells Nobel. In an online auction that concluded on 28 May, Leon Lederman's Nobel medal sold for $765 002. Lederman shared the 1988 Nobel Prize in Physics for the discovery of the muon neutrino. Born in 1922, Lederman is also known for his role in discovering the bottom quark, working on behalf of public education in science, and dubbing the Higgs boson the "God particle."

According to Sam Heller, a spokesman for Nate D. Sanders Auctions in Los Angeles, Lederman's medal fetched the fourth-highest price among just 10 Nobel medals ever sold. The only other medal sold by a living laureate was that of James Watson, co-discoverer of the structure of DNA; it drew nearly $4.8 million last year. Lederman's medal (see photo) is made of 18-kt gold and plated in 24-kt gold.

In a statement delivered via Fermilab, where Lederman served as director from 1979 to 1989, he and his wife, Ellen, wrote, "We feel it is time for someone else to have a chance to own this piece of history. We hope this auction raises the awareness of physics research in the United States and around the world." **TF** ■

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