



Detector on the move

The new spectrometer for KATRIN, the Karlsruhe Tritium Neutrino experiment, was transported through the German village of Leopoldshafen on 25 November 2006 on the way to Karlsruhe. Unlike neutrino oscillation experiments, which measure mass differences, the KATRIN experiment is designed to determine the mass of the electron neutrino to within 0.2 eV. But instead of measuring the ν_e mass directly, the experiment will examine the high-energy end of the spectrum of electrons given off by the beta decay of tritium. To achieve the needed sensitivity, the design called for an ultrahigh-vacuum spectrometer 23 m long and 10 m in diameter. The spectrometer houses a so-called MAC-E filter (magnetic adiabatic collimation combined with an electrostatic filter).

The spectrometer was constructed in Deggendorf, about 400 km from Karlsruhe. But neither the roads between the two cities nor the canal between the Danube and Rhine rivers could accommodate transporting it. The spectrometer therefore made a 2-month, 9000-km detour—down the Danube, across the Black Sea, through the Bosphorus Strait and the Strait of Gibraltar, north to the English Channel, and finally up the Rhine, to be unloaded near Leopoldshafen. After being towed through the town, clearing some buildings and street lamps by mere centimeters, the spectrometer finally arrived at the Karlsruhe Research Center and was installed. (Photo courtesy of the Karlsruhe Research Center.)

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