

## Super-heated fusion experiment to reach 100 million degrees

*Good luck – because it is not only temperature that is required but persistence.*

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Chinese scientists plan to test fire the world's most powerful experimental fusion reactor hoping its fuel will reach a critical mass of 100 million degrees Celsius and begin to give off more energy than it consumes.

Wan Yuanxi, general manager of the Experimental Advanced Superconducting Tokamak (EAST), said in an interview with Xinhua, that EAST's experiment is scheduled for mid August.

"The discharge is expected to last 1,000 seconds, which would be the longest on record," Wan said.

"The data will be submitted to this year's International Atomic Energy Agency General Conference in September in Austria," Wan said.

With support of the National Mega-Project of Science Research, the Institute of Plasma Physics under the Chinese Academy of Sciences (CAS) spent eight years and 200 million yuan (25 million U.S. dollars) on building the experimental reactor.

"If the experiment succeeds, EAST will become the first non-circular steady-state experimental plasma device in operation, and we will lead all our competitors by at least a decade," said Li Jiangang, who heads the CAS institute.

The experiment is being conducted in collaboration with the International Thermonuclear Experimental Reactor (ITER) which is an international program dedicated to experiments in thermonuclear fusion. In 2003, China joined ITER which was originally initiated by the United States and Russia in the 1980s. ITER also runs a fusion reactor based in Russia which is four-times the size of EAST.

Unlike traditional fission nuclear reactors, which split atoms to create energy and cast off dangerous radioactive waste, fusion reactors emulate nuclear reactions of the sun and are pollution free. A viable fusion reactor would be a panacea for the world's energy woes, as its fuel, Deuterium, is a hydrogen isotope which can be collected from seawater.

The EAST experiment will attempt to create a super heated plasma through a process using huge annular electromagnetic fields. Wan and his colleagues hope to heat the fuel to 100,000 degrees Celsius and then control the resulting plasma at a temperature of 100 million Celsius degrees. Wan says at that temperature the plasma, which is neither a gas, a liquid nor a solid, should begin to give off its own energy.

If the experiment lasts the planned 1,000 seconds (more than 16 minutes) EAST, which is located near the city of Hefei, in central China's Anhui province, will hold the record for the world's longest fusion burn.