

# Perspectives on the PandaX Dark Matter Experiment

The PandaX experiment of China, which is located in the deepest underground laboratory, has recently released its technical design report [1].

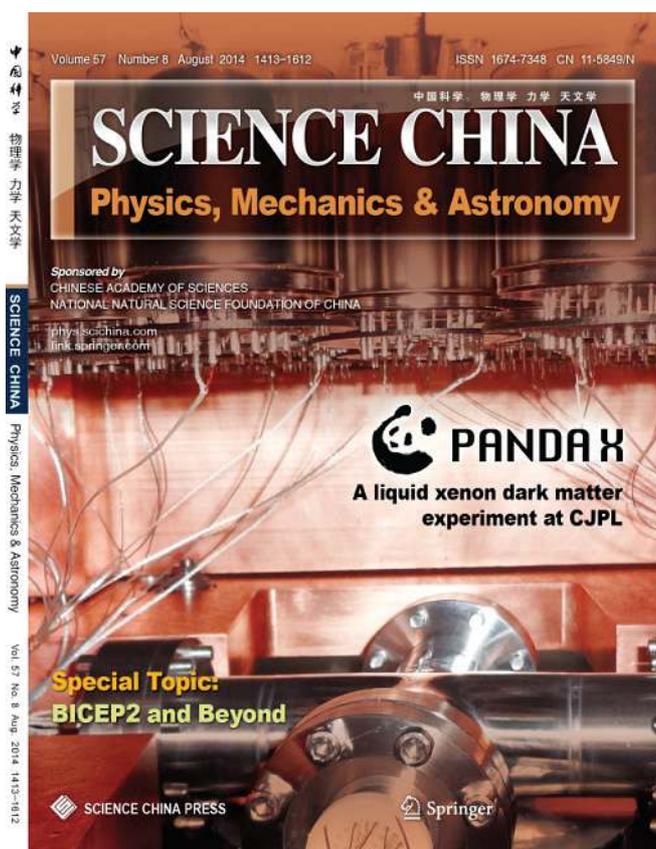
The Particle and Astrophysical Xenon (PandaX) collaboration was established in 2009 and supported by the Ministry of Science and Technology, the Ministry of Education in China, the Natural Science Foundation of China, and Shanghai Jiao Tong University. The experiment is suitable for both direct dark matter detection and the search for Xe-136 neutrinoless double beta decay.

The experiment employs the most promising Xenon dual-phase technology to capture both the primary scintillation and the ionization from proportional scintillation, similar to the XENON and LUX experiments. At the current stage, the experiment is running at a target mass of about 120kg, similar to that of XENON100. The detector could be upgraded to half-ton scale mass shortly.

The China Jinping Underground Laboratory (CJPL), shielded by 2400 m of low radioactive rocks, provides protection well for PandaX against cosmic muons. The muon flux was measured to be the lowest one among all similar experimental facilities so far. In addition, a passive shield consisting of about 100 tons of PE, lead, and copper was constructed to attenuate the neutrons and gammas from environmental materials, such as the cavern wall rocks and concrete. Due to these efforts, the PandaX detector is running in a low background environment.

Several years ago, a reliable cryogenic and gas-handling system for PandaX was successfully built. The facility was moved into CJPL in August, 2012.

The Xenon dual-phase technology was verified in two commissioning runs in 2013 and early 2014, in which the key parameters of the experiment, such as the light yield, were measured. The experiment started to collect data in late March, 2014.



**Fig. 1:** PandaX experiment introduced in "SCIENCE CHINA: Physics, Mechanics & Astronomy" as a cover story.

The first result from PandaX is expected to be released later this year.

## References

- [1] Cao XG, Chen X, Chen YH, et al. PandaX: A liquid xenon dark matter experiment at CJPL. SCIENCE CHINA Physics, Mechanics & Astronomy, Vol. 57, No. 8, 2014 (pages 1476–1494).