Editorial

The paradigm that our universe is dominated by non-luminous matter, i.e., dark matter, rather than ordinary baryonic matter, has been established since the 1980s. However, the nature of dark matter remains almost unknown. Many ongoing space experiments are aiming at uncovering the particle nature of dark matter via precise measurements of the flux of cosmic-ray particles, with a hope to find fingerprints that tiny annihilations or decays of dark matter may have left. Such experiments include PAMELA, Fermi-LAT, and AMS-02, all of them have made extraordinary discoveries. The DAMPE experiment is a new player in the game. The key component of the DAMPE detector is a calorimeter with both a large acceptance and a long radiation length, which makes it unique for dark matter research. For instance, DAMPE is capable of detecting a cosmic-ray electron with a maximum energy of ~ 10 TeV.

This first result of DAMPE was published recently, attracting enormous interest worldwide. This special topic includes five papers on the DAMPE results. Yuan et al. [1] provided an exclusive overview of the design, test, and performance of the DAMPE detector as well as the general implications of the first DAMPE result in the search for dark matter. Tang et al. [2] discussed lepton-portal dark matter models. Wang et al. [3] discussed the possible sources of both dark matter and nearby pulsars, whereas Gu [4] explored the connection between the DAMPE events and the observation of 3.5-keV gamma ray line signals. Pan et al. [5] discussed the decay of dark matter.

It is our great pleasure to have served as guest editors for this special topic, and we are very grateful to all the authors who have contributed to the relevant research topics and the compiling of the review article. We expect more inspiring research results on dark matter detection to appear in China and are looking forward to editing a voluminous special issue on dark matter physics in the near future.

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1 Q. Yuan, and L. Feng, *Sci. China-Phys. Mech. Astron.* **61**, 101002 (2018).

2 Y. L. Tang, L. W. M. G. Zhang, and R. Zheng, *Sci. China-Phys. Mech. Astron.* **61**, 101003 (2018).

3 B. B. Wang, X. J. Bi, S. J. Lin, and P. F. Yin, *Sci. China-Phys. Mech.*

Astron. **61**, 101004 (2018).

4 P. H. Gu, *Sci. China-Phys. Mech. Astron.* **61**, 101005 (2018).

5 X. Pan, C. Zhang, and L. Feng, *Sci. China-Phys. Mech. Astron.* **61**, 101006 (2018).