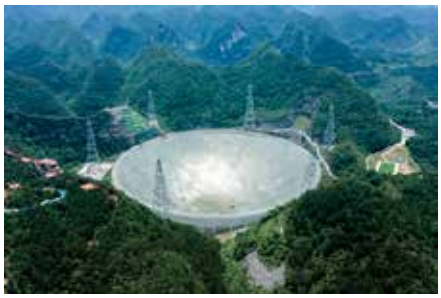
In This Issue

InBrief | Welcome to FAST

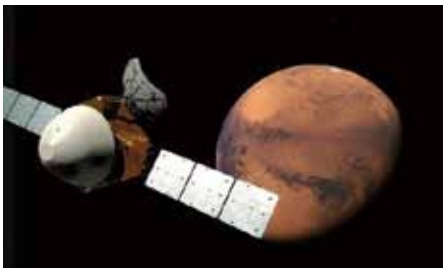
Resulting from its 15-month inaugural listening session and prelaunch testing period, the Five-hundred-meter Aperture Spherical radio Telescope (FAST), the biggest and the most sensitive single-dish radio telescope in the world, has already helped astronomers discover more than 200 pulsars and publish more than 60 peer-reviewed papers. Now, users of ANY nationality or affiliation are invited to submit regular science proposals, less than 100 observing hours each, for its upcoming observing period. Proposals coming between March 31 to May 15, 2021 will be considered. Turn to page 4 for more.



The FAST in a bird's-eye view (Credit: NAOC)

InFocus | Sharp Eye on *Tianwen*-1

On February 10, *Tianwen*-1, China's first Mars probe, braked to embrace the Red Planet's gravity field safe and sound. The adventure involves sophisticated adjustment in the spacecraft's flying loci, and this relies on precise, real-time measuring of its current position. Thanks to its sensitivity in apparent angular variations of a remote object, the Chinese Very Long Baseline Interferometry Network at CAS plays an instrumental role in the probe's transfer into Mars orbit. Read more on page 8.



Tianwen-1 (Credit: CNSA)

Special | 2020 Annual Top 10 Science Advances of China in the Eye of Scientists

On February 27, we embraced the revealing of the "Annual Top 10 Science Advances" of 2020 in China (Annual Top 10), released by the High Technology Research and Development Center (HTRDC) of the Chinese Ministry of Science and Technology.

Topping the list is the collective efforts made by Chinese scientists to contain the coronavirus epidemic. The list extends to the explorations to the moon, to the deepest trench in the ocean and the highest mountain on the land. Among others, the list also embraces the reconstruction of the history of prehistoric Chinese populations informed by traces of ancient DNAs, as well as the history of marine invertebrates through an enormous collection of fossil species that span the Paleozoic through the Early Triassic.

The selection went through three steps: recommendation, primary election and final selection. 286 picks of science advances were recommended by editorial offices from five domestic scientific journals to compete for the Annual Top 10. In the primary selection meeting held in December 2020, HTRDC assigned these recommended picks into four combined groups. Screened by the invited scientists, 31 picks of science advances entered final selection that was conducted by online voting. At the finale, around 3,200 leading scientists participated the online voting. As a result, the top 10 votes were recognized as the "Annual Top 10 Science Advances" of 2020 in China.

For more detail, please turn to page 12.

Highlights | "Traditional" Eye Offers Novel Insights

Insight-HXMT (Credit: IHEP)

Resulting from an observational campaign occurring in April 2020, a team working on *Insight*-HXMT, a wide-band X-ray telescope in space launched in 2017 by CAS, unambiguously identifies magnetar SGR J1935+2154 as the origin of a fast radio burst (FRB) from our own Milky Way. In a paper published in February 2021, the team reports the most accurate localization among counterparts and suggests possible physical mechanism for these millisecond pulses.

Combining results from multiple observations targeting the same object, scientists recognize for the very first time the sender of an FRB, but more questions are to answer. Read more on page 22.

Highlights | Pin Down Sources for New Hepatocytes by Tracing Proliferating Cells

Cell proliferation is a fundamental process in all multicellular organisms that is required to enable development, tissue homeostasis, repair and regeneration. Approaches to detect proliferative cells *in vivo* are therefore of high value in understanding many biological or pathological processes.

Considering the limited resolution of current approaches in monitoring proliferation events, CAS scientists developed a powerful method of proliferation tracing, dubbed ProTracer, which enables inducibly and permanently labeling of specific proliferating cells with a fluorophore. Highlighting its capabilities, they settled a long-standing debate regarding the zonal contribution of different hepatocyte populations during liver homeostasis and regeneration.

For more detail, turn to page 31.

ThinkTank Report | CAS Academicians Offer Suggestions on Smart City Building in China

A consultative group of CAS Academic Divisions, via consultation with CAS Members of involved areas, givs thoughts and suggestions on smart city building in China based on a review of past experiences in this regard from other countries.

For more, please turn to page 34.

ScienceWatch | New Candidate for Tetraquark Meson

Scientists have sought to observe in experiment a kind of exotic hadrons that each comprise four quarks, or tetraquark state, for a long time. Unlike conventional three-quark baryons and two-quark mesons containing one or three quarks, a tetraquark hadron features an alliance of four, and might offer new clues for strong interactions between sub-atomic particles. Ensuing its detection of $Z_c(3900)$, the first "tetraquark" hadron in 2013, the Beijing Spectrometer III collaboration furthers to report their discovery of $Z_{cs}(3985)$ – the first candidate for a tetraquark meson containing hidden-charm with non-zero strangeness.

Turn to page 40 for detail.

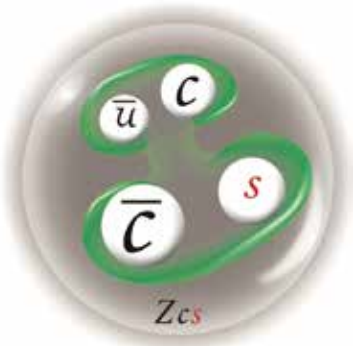


Illustration for the tetraquark constituent (Credit: IHEP)