



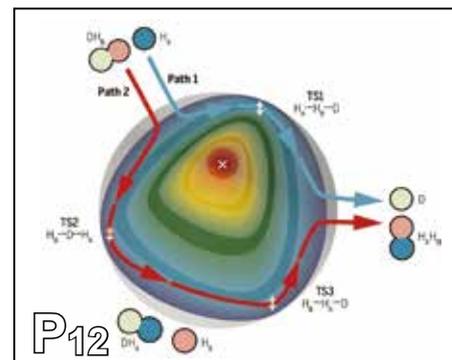
Contents

P₈

Cover Story:

On March 26, the China National Space Administration (CNSA) releases two profiles of Mars shot by *Tianwen-1*, the first Mars probe of China. Shown here is the one taken from the northern celestial hemisphere. Having orbiting the Red Planet for over a month, the probe took snapshots of the planet's side face on March 18, at a distance of about 11,000 km from the target, using a moderate-resolution camera. An initiator of China's Mars Exploration Program, the Chinese Academy of Sciences has been seeing through the Program's implementation.

Read more on page 8.



"Annual Top 10 Science Advances" of 2020 in China is revealed on February 27. In the list is an interesting case of quantum interference in a hydrogen exchange reaction observed by CAS scientists.

BCAS
www.bcas.cas.cn

March 2021
Vol.35 No.1
Pages 1 – 64

Editor-in-chief
BAI Chunli
Executive Vice Editor-in-chief
ZHANG Tao

Vice Editors-in-chief
Mu-ming Poo, LI Guojie, FU Bojie, GUO Huadong, TAN Tieniu,
WANG Keqiang, YANG Liuchun

Editor
SONG Jianlan
Associate Editors
GUO Haiyan
YAN Fusheng
Design & Layout
YUAN Miao

General Editorial Office
Tel/Fax: 86-10-62542631
Email: bulletin@mail.casipm.ac.cn
P.O. Box 8712, Beijing 100190, China

Sponsored by the Chinese Academy of Sciences
Published by Science Press
Printed by Beijing Reach Mine Printing CO., LTD.

Domestic subscription (1 year): 400 yuan.
Domestic and overseas distribution: Science Press

Launched in 1987, the *Bulletin of the Chinese Academy of Sciences (BCAS, ISSN 1003-3572)* is a quarterly published every March, June, September and December. Copyright © 2020 by the Chinese Academy of Sciences. Please note that the views expressed in *BCAS* are those of the authors, and are not necessarily those of the Academy or the editors. For subscription, please contact Science Press at +86-10-64017032, mazhiyong@mail.sciencep.com.

BCAS has licensed CNKI to digitally copy, compile, publish, and disseminate the full text of our journal by network. The remuneration paid by our journal includes the copyright fee of CNKI. All authors who submit articles to our journal for publication are deemed to agree with the above statement. If there is any objection, please indicate at the time of submission, we will deal with it accordingly.

2 In This Issue

InBrief

- 4 World's Most Sensitive Radio Telescope Concludes 15-month Listening Session, Accepting International Proposals
- 6 Water Cherenkov Detector Array at Large High-Altitude Air Shower Observatory Now in Operation

InFocus

- 8 VLBI: A Sharp Eye on *Tianwen-1*

Special

- 12 Annual Top 10 Science Advances of 2020 in China – To Honor and to Inspire

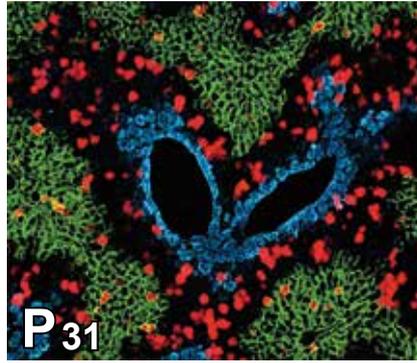
Highlights

- 22 When Neighbors Talk with Each Other
– *Insight-HXMT* and its identification of the sender of FRB 200428, a cosmic "telegram"



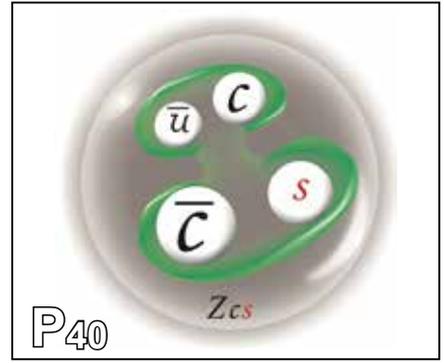
P22

Insight-HXMT, an astronomical satellite of China working in a very broad X-ray waveband, has helped identify a magnetar as the origin of a fast radio burst from our own galaxy.



P31

Using a new method of proliferation tracing, named 'ProTracer', researchers settled a long-lasting debate regarding the zonal contribution of different hepatocyte populations during liver homeostasis and regeneration.



P40

BESIII collaboration announces the detection of the first candidate for a tetraquark meson containing hidden-charm with non-zero strangeness, a long-sought-after exotic hadron.

- 31 Pin Down Sources for New Hepatocytes by Tracing Proliferating Cells

ThinkTank Report

- 34 Thoughts and Suggestions on China's Smart City Building

Science Watch

Basic Research

- 40 Observation of the $Z_{cs}(3985)$ Strange Four-quark Meson: The first hidden-charm tetraquark state with non-zero strangeness
- 42 Scientists Probe Electronic Angular Momentum to a Chemical Reaction for the First Time
- 44 Novel Catalyst Boosts Hydrogenation of CO_2 to Methanol: Higher Activity, Selectivity and Stability

Life Sciences

- 46 Recapitulating the Lung Pathophysiology of COVID-19 in a Human Organ Chip
- 48 Targeting DNA-sensing Pathway may Save the Elderly from Aging-related Autoimmune Inflammation

- 50 New Strategy to Develop an mRNA Vaccine for Durable Cancer Immunotherapy

- 52 Scientists Provided and Practiced a Rational Strategy for Creating Novel Type of Rice Crop from a Wild Allotetraploid Rice

- 54 Understanding the Architecture of Plant Immune System

- 56 Engineering Platelets for Combined Anticancer Therapy

- 58 Scientists Engineer Virus to Fight Against Bacteria

Earth Sciences

- 59 Climate Change Influences Biodiversity Evolution of Birds: Study

- 61 New Findings on Devonian "Platypus Fish" Cast Light on Evolution of Modern Jawed Vertebrates

- 63 Researchers Announce World's First Dinosaur Preserved Sitting on Nest of Eggs that Includes Fossilized Babies