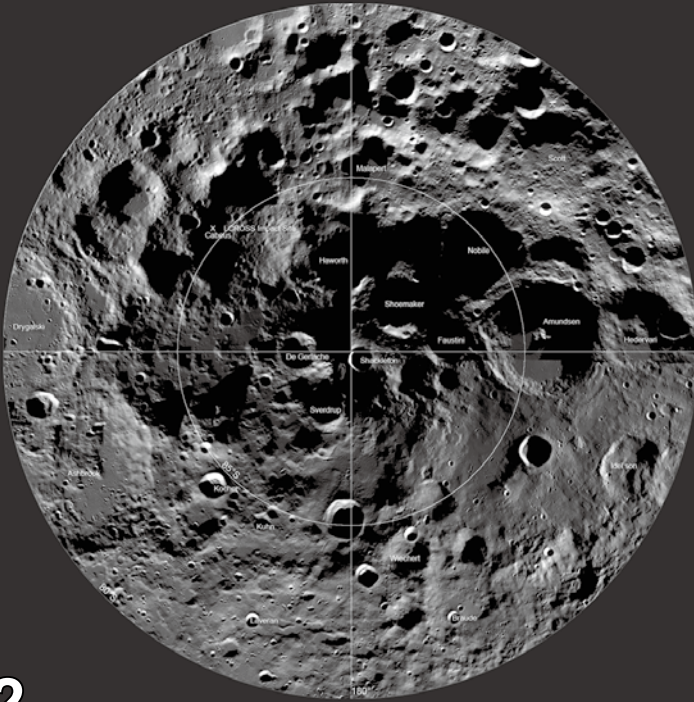


Contents



P72

Cover Story

A mosaic picture of the South Pole region of the Moon as released on September 27, 2010. The image has resulted from lots of snapshots taken in over a month by the Wide Angle Camera of NASA's Lunar Reconnaissance Orbiter Camera. The volatile compounds, including water ice found in this region, provide not only clues on the origin of our Solar System, but also valuable resources for future lunar explorers. Together with many other advantages, this has made the region an attractive site for a permanent lunar outpost of humankind.

When extending its space exploration to deeper space and outer planets, China is launching a plan to jointly design and build a Lunar Research Station open to the whole humankind with the European Space Agency and Russian Space Agency. For more please refer to page 72.

(Credit: NASA/GSFC/Arizona State University)

BCAS

www.bcas.cas.cn

Vol.33 No.2, 2019
Pages 65 – 128

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

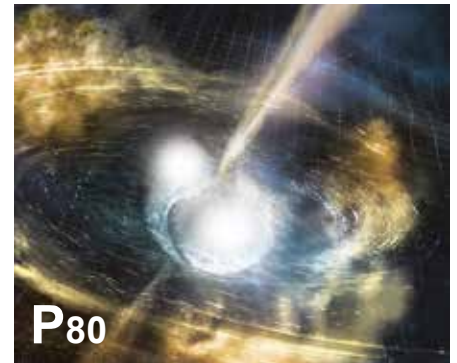
Design & Layout

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
Domestic subscription (1 year): 400 yuan.

The views expressed in the *Bulletin of the Chinese Academy of Sciences* are those of the authors, and are not necessarily those of the Academy or the editors.



P80

Amid the third observing run (O3) of the LIGO-Virgo coordination, astrophysicists in China and abroad seek to make the best from multi-messenger astronomy, from observation to theoretical exploration.

66 In This Issue

69 Starting with Basic Research,
CAS and Leopoldina Vow to
Promote Science for Future

InFocus

72 China Emphasizes International
Cooperation in Future Lunar
and Deep Space Exploration

80 Seeing through the Cosmic
Ripples: Embrace the Era of
Multi-messenger Astronomy

Highlights

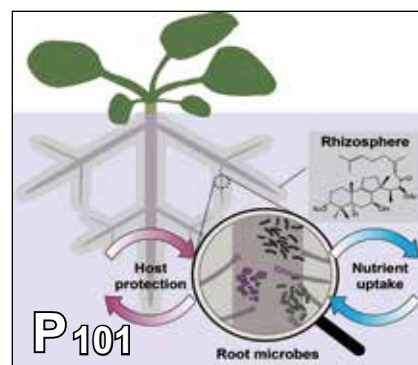
87 Cold Atoms Identified as Inflows
Fueling Quasar Black Hole
Accretion Disks



Astrophysicists find out the “last piece” of the mosaic of the black hole accretion model, which explains how the central engines of quasars power these mysterious celestial bodies.



A joint team of scientists find that circular RNAs, once thought a “mistake”, turn out to be a biological lock on an important anti-viral factor, whose overreaction is associated with autoimmune diseases like lupus.



A small mustard plant uses certain chemicals to shape root microbes to its own advantage, such as improved nutrient absorption and protection from pathogenic species.

- 91 Circular RNAs Found Curbing Overreaction of Antiviral Factor Connected to Lupus
- 96 Enterovirus B Sneaks into Victim Cells through Accomplice Receptors
- 101 Root Chemicals Help Plants Shaping Soil Microbes

Science Watch

Basic Research

- 103 Coherent Resonant Tunneling through Double Metallic Quantum Well States
- 105 Emmy Noether Looks at the Deconfined Quantum Critical Point
- 107 Monte Carlo Study Reveals the Parent State of Quantum Phases
- 109 Scientists Develop High-Safety and Scalable Micro-Batteries
- 110 Artificial Biohybrid Nanosystem for ATP Production

Life Sciences

- 111 DNA Base Editing Induces Substantial Off-target RNA Mutations and Their Elimination by Mutagenesis
- 113 Harvest Synchronous Baby Cells from Microfluidic Channels
- 115 DNA Probe Specifically Binding Protein Heterodimer Rather Than Monomers
- 117 Scientists Provide A New Option for Anti-Leukemia Therapy
- 119 Combatting Zika Virus through Enhancing RNAi
- 121 Survival Tricks for Living under Deep-Sea Pressure

Earth Sciences

- 123 Coastal Organisms Trapped in 99-Million-Year-Old Amber
- 125 A New Middle Pleistocene Human Skull Found in China Reveals the Variation and Continuity in Early Asian Humans
- 126 New Jurassic Non-avian Theropod Dinosaur Sheds Light on Origin of Flight in Dinosauria
- 128 New Species of Lizard Found in Stomach of Microraptor