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星系与宇宙学

Scientists from MSU have invented a new way to 'weigh' intergalactic black holes

ABSTRACT: Astrophysicists from Moscow State University have found a new way to estimate the mass of supermassive black holes outside our galaxy, even if these holes are barely detectable. The results of the study were published in the Astronomy and Astrophysics journal

TITLE: Swift J164449.3+573451 and Swift J2058.4+0516: Black hole mass estimate using a tidal disruption event flare

AUTHOR: L. Titarchuk, E. Seifina

PUBLISHED: A&A, Forthcoming article, Received: 25 March 2017 - Accepted: 07 July 2017

arXiv: [1707.05898](https://arxiv.org/abs/1707.05898)

DOI: <http://dx.doi.org/10.1051/0004-6361/201730869>



Physicists offer explanation for diverse galaxy rotations

ABSTRACT: A University of California, Riverside-led team of physicists has found a simple and viable explanation for the diversity observed in galactic rotations. Hai-Bo Yu and colleagues report that diverse galactic-rotation curves, a graph of rotation speeds at different distances from the center, can be naturally explained if dark matter particles are assumed to strongly collide with one another in the inner halo, close to the galaxy's center -- a process called dark matter self-interaction.

TITLE: Self-Interacting Dark Matter Can Explain Diverse Galactic Rotation Curves

AUTHOR: Ayuki Kamada, Manoj Kaplinghat, Andrew B. Pace, and Hai-Bo Yu

PUBLISHED: Phys. Rev. Lett. 119, 111102 (2017) - Published September 13, 2017

DOI: <https://doi.org/10.1103/PhysRevLett.119.111102>

Astronomers spun up by galaxy-shape finding

ABSTRACT: shape -- something scientists have tried to do for 90 years -- using a sample of 845 galaxies. Because a galaxy's shape is the result of past events such as merging with other galaxies, knowing its shape also tells us about the galaxy's history. The team made its findings with SAMI (the Sydney-AAO Multi-object Integral field unit), a game-changing instrument.

FUNDER: Australian Research Council Centre of Excellence for All-sky Astrophysics (CAASTRO)

TITLE: The SAMI Galaxy Survey: the intrinsic shape of kinematically selected galaxies

AUTHOR: C. Foster, J. van de Sande, F. D'Eugenio, et al.

PUBLISHED: Monthly Notices of the Royal Astronomical Society, Volume 472, Issue 1, 21 November 2017, Pages 966–978

DOI: <https://doi.org/10.1093/mnras/stx1869>

Explosive birth of stars swells galactic cores

ABSTRACT: Astronomers found that active star formation upswells galaxies, like yeast helps bread rise. Using three powerful telescopes on the ground and in orbit, they observed galaxies from 11 billion years ago and found explosive formation of stars in the cores of galaxies. This suggests that galaxies can change their own shape without interaction with other galaxies.



FUNDER: Japan Society for the Promotion of Science, German Academic Exchange Service

MEETING: Biannual Meeting of the Astronomical Society of Japan

TITLE: Rotating Starburst Cores in Massive Galaxies at $z = 2.5$

AUTHOR: Ken-ichi Tadaki, Tadayuki Kodama, Erica J. Nelson, Sirio Belli, et al.

PUBLISHED: The Astrophysical Journal Letters, Volume 841, Number 2

DOI: <https://doi.org/10.3847/2041-8213/aa7338>

恒星与银河系

Is the Milky Way an 'outlier' galaxy? Studying its 'siblings' for clues

ABSTRACT: The most-studied galaxy in the universe -- the Milky Way -- might not be as 'typical' as previously thought, according to a new study. Early results from the Satellites Around Galactic Analogs (SAGA) Survey indicate that the Milky Way's satellites are much more tranquil than other systems of comparable luminosity and environment. Many satellites of those 'sibling' galaxies are actively pumping out new stars, but the Milky Way's satellites are mostly inert, the researchers found.

TITLE: The SAGA Survey. I. Satellite Galaxy Populations around Eight Milky Way Analogs

AUTHOR: Marla Geha et al.

PUBLISHED: 2017 September 14, The Astrophysical Journal, Volume 847, Number 1

arXiv: arxiv.org/abs/1705.06743

DOI: <https://doi.org/10.3847/1538-4357/aa8626>

Aging star blows off smoky bubble

ABSTRACT: Astronomers have used ALMA to capture a strikingly beautiful view of a delicate bubble of expelled material around the exotic red star U Antliae. These observations will help astronomers to better understand how stars evolve during the later stages of their life-cycles.

TITLE: Rings and filaments. The remarkable detached CO shell of U Antliae

AUTHOR: F. Kerschbaum et al.

PUBLISHED: Astronomy & Astrophysics 605, A116 (2017), September 5, 2017

DOI: <https://doi.org/10.1051/0004-6361/201730665>



New supernova analysis reframes dark energy debate

ABSTRACT: The accelerating expansion of the Universe may not be real, but could just be an apparent effect, according to new research published in the journal Monthly Notices of the Royal Astronomical Society. The new study -- by a group at the University of Canterbury in Christchurch, New Zealand -- finds the fit of Type Ia supernovae to a model universe with no dark energy to be very slightly better than the fit to the standard dark energy model.

TITLE: Apparent cosmic acceleration from Type Ia supernovae

AUTHOR: Lawrence H. Dam, Asta Heinesen, David L. Wiltshire

PUBLISHED: Monthly Notices of the Royal Astronomical Society, Volume 472, Issue 1, 21 November 2017, Pages 835–851,

DOI: <https://doi.org/10.1093/mnras/stx1858>

A one-of-a-kind star found to change over decades

ABSTRACT: Researchers at the University of Notre Dame recently found new evidence that lends support to an existing theory of how the unusual star emits energy.

TITLE: Long-term Photometric Variations in the Candidate White-dwarf Pulsar AR Scorpii from K2, CRTS, and ASAS-SN Observations

AUTHOR: olin Littlefield, Peter Garnavich¹, Mark Kennedy, Paul Callanan, Benjamin Shappee, and Thomas Holoien

PUBLISHED: The Astrophysical Journal Letters, Volume 845, Number 1, Published 2017 August 10

DOI: <http://iopscience.iop.org/article/10.3847/2041-8213/aa8300/pdf>



太阳物理

Solar wind impacts on giant 'space hurricanes' may affect satellite safety

ABSTRACT: Could the flapping of a butterfly's wings in Costa Rica set off a hurricane in California? For most people, this hypothetical scenario may be difficult to imagine on Earth -- particularly when a real disaster strikes. Yet, in space, similarly small fluctuations in the solar wind as it streams toward the Earth's magnetic shield actually can affect the speed and strength of 'space hurricanes,' researcher Katariina Nykyri of Embry-Riddle Aeronautical University has reported in the Journal of Geophysical Research - Space Physics.

TITLE: Influence of Velocity Fluctuations on the Kelvin-Helmholtz Instability and its Associated Mass Transport

AUTHOR: Katariina Nykyri, Xuanye Ma, Andrew Dimmock, Claire Foullon, Antonius Otto and Adnane Osmane

PUBLISHED: Journal of Geophysical Research - Space Physics

FUNDER: Academy of Finland, National Science Foundation, NASA, International Space Science Institute

DOI: [10.1002/2017JA024374](https://doi.org/10.1002/2017JA024374)

太阳系和系外行星系统

Scientists propose new concept of terrestrial planet formation

ABSTRACT: A team of scientists from NASA, Hampton University and the University of Hong Kong propose a new way of understanding the cooling and transfer of heat from terrestrial planetary interiors and how that affects the generation of the volcanic terrains that dominate the rocky planets.

TITLE: Heat-pipe planets

AUTHOR: William B. Moore, Justin I. Simon, A. Alexander G. Webb

PUBLISHED: Earth and Planetary Science Letters, Volume 474, 15 September 2017, Pages 13-19

DOI: <https://doi.org/10.1016/j.epsl.2017.06.015>



New research suggests Mercury's poles are icier than scientists thought

ABSTRACT: A Brown University study identifies three large surface ice deposits near Mercury's north pole, and suggests there could be many additional small-scale deposits that would dramatically increase the planet's surface ice inventory.

TITLE: New evidence for surface water ice in small-scale cold traps and in three large craters at the north polar region of Mercury from the Mercury Laser Altimeter

AUTHOR: Ariel N. Deutsch, Gregory A. Neumann, James W. Head

PUBLISHED: Geophysical Research Letters, Accepted manuscript online: 14 September 2017

FUNDER: NASA

DOI: [10.1002/2017GL074723](https://doi.org/10.1002/2017GL074723)

More evidence of water on Mars

ABSTRACT: River deposits exist across the surface of Mars and record a surface environment from over 3.5 billion years ago that was able to support liquid water at the surface. A region of Mars named Aeolis Dorsa contains some of the most spectacular and densely packed river deposits seen on Mars.

TITLE: Fluvial stratigraphy of valley fills at Aeolis Dorsa, Mars: Evidence for base-level fluctuations controlled by a downstream water body

AUTHOR: Benjamin T. Cardenas; David Mohrig; Timothy A. Goudge

PUBLISHED: Geological Society of America Bulletin, Published: September 2017

DOI: <https://doi.org/10.1130/B31567.1>

KFU astronomers discovered an exoplanet together with Turkish and Japanese colleagues

ABSTRACT: In the last 20 years several thousand exoplanets have been found orbiting solar-type stars, but only about a hundred around giant stars. Most of them are 10 to 20 times heavier than Jupiter, and only



about 15 planets are close to Jupiter in mass. This is the first time in Russian astronomy when a planet was discovered with spectroscopic methods.

TITLE: A Jupiter-mass planet around the K0 giant HD 208897

AUTHOR: M. Yilmaz, B. Sato, I. Bikmaev, S.O. Selam, H. Izumiura, V. Keskin, E. Kambe, S.S. Melinkov, A. Galeev, I. Ozavci, E.N. Irtuganov, and R. Ya. Zhuchkov

PUBLISHED: A&A, Forthcoming article - Received: 17 May 2017 - Accepted: 26 July 2017

DOI: <https://doi.org/10.1051/0004-6361/201731184>

Are we being watched? Tens of other worlds could spot the Earth

ABSTRACT: A group of scientists from Queen's University Belfast and the Max Planck Institute for Solar System Research in Germany have turned exoplanet-hunting on its head, in a study that instead looks at how an alien observer might be able to detect Earth using our own methods. They find that at least nine exoplanets are ideally placed to observe transits of Earth, in a new work published in the journal Monthly Notices of the Royal Astronomical Society.

TITLE: Transit Visibility Zones of the Solar System Planets

AUTHOR: R. Wells, K. Poppenhaeger, C. A. Watson, R. Heller

PUBLISHED: Monthly Notices of the Royal Astronomical Society, stx2077 - Published: 14 August 2017

DOI: <https://doi.org/10.1093/mnras/stx2077>

天文技术方法和仪器

New mirror-coating technology promises dramatic improvements in telescopes

ABSTRACT: At UC Santa Cruz, an electrical engineer has teamed up with astronomers to improve telescope mirrors using thin-film technology from the electronics industry. They are developing new protective coatings using an atomic layer deposition system large enough to accommodate telescope mirrors.

FUNDER: National Science Foundation



TITLE: Corrosion protection of silver-based telescope mirrors using evaporated anti-oxidation overlayers and aluminum oxide films by atomic layer deposition

AUTHOR: David M. Fryauf; Andrew C. Phillips; Nobuhiko P. Kobayashi

PUBLISHED: Proceedings Volume 9924, Low-Dimensional Materials and Devices 2016; 99240S (2016);

DOI: [10.1117/12.2238749](https://doi.org/10.1117/12.2238749)

Scientists use mismatch in telescopic data to get a handle on quasars and their 'tails'

ABSTRACT: Scientists compared the data on the coordinates of quasars obtained by Gaia and VLBI and suggested a method for revealing structure indirectly by means of combining the data from existing telescopes. Moreover, the precision they've got is superior to what is possible with ordinary optical telescopes and even with Hubble.

FUNDER: Russian Science Foundation, NASA, and others

TITLE: Observational consequences of optical band milliarcsec-scale structure in active galactic nuclei discovered by Gaia

AUTHOR: L. Petrov, Y. Y. Kovalev

PUBLISHED: Monthly Notices of the Royal Astronomical Society, Volume 471, Issue 4, 11 November 2017, Pages 3775–3787, Published: 18 August 2017

DOI: <https://doi.org/10.1093/mnras/stx1747>

文章推荐

Nature

Hubble discovers a unique type of object in the solar system

ABSTRACT: With the help of the NASA/ESA Hubble Space Telescope, a German-led group of astronomers have observed the intriguing characteristics of an unusual type of object in the asteroid belt between Mars and Jupiter: two asteroids orbiting each other and exhibiting comet-like features, including a bright coma and



a long tail. This is the first known binary asteroid also classified as a comet. The research is presented in a paper published in the journal Nature today.

TITLE: A binary main-belt comet

AUTHOR: Jessica Agarwal, David Jewitt, Max Mutchler, Harold Weaver & Stephen Larson

PUBLISHED: Nature 549, 357–359 (21 September 2017)

DOI: [10.1038/nature23892](https://doi.org/10.1038/nature23892)

Discovery of the closest binary supermassive black hole system in the galaxy NGC 7674

ABSTRACT: Scientists from NCRA-TIFR, Pune, and RIT, USA, have discovered the closest ever binary supermassive black hole system in a spiral galaxy NGC 7674, located about 400 million light years from Earth. The apparent separation of the two black holes in the binary system is less than one light year. This is direct observational proof of the existence of close supermassive black hole binary systems inside galaxies, which are potential sources of gravitational waves.

TITLE: A candidate sub-parsec binary black hole in the Seyfert galaxy NGC 7674

AUTHOR: P. Kharb, D. V. Lal & D. Merritt

PUBLISHED: Nature Astronomy (2017), Published online:18 September 2017

arXiv: [1709.06258](https://arxiv.org/abs/1709.06258)

DOI: [10.1038/s41550-017-0256-4](https://doi.org/10.1038/s41550-017-0256-4)

When radio galaxies collide, supermassive black holes form tightly bound pairs

ABSTRACT: Supermassive black holes found in the centers of galaxies can form gravitationally bound pairs when galaxies merge, according to a study published in the Sept. 18 issue of Nature Astronomy.

TITLE: A candidate sub-parsec binary black hole in the Seyfert galaxy NGC 7674

AUTHOR: P. Kharb, D. V. Lal & D. Merritt

PUBLISHED: Nature Astronomy (2017), published online:18 September 2017

arXiv: [1709.06258](https://arxiv.org/abs/1709.06258)

DOI: [10.1038/s41550-017-0256-4](https://doi.org/10.1038/s41550-017-0256-4)



Secrets of bright, rapidly spinning star revealed

ABSTRACT: Almost 50 years after it was first predicted that rapidly rotating stars would emit polarized light, a UNSW Sydney-led team of scientists has succeeded in observing the phenomenon for the first time. They used a highly sensitive piece of equipment designed and built at UNSW and attached to the Anglo-Australian Telescope at Siding Spring Observatory in western NSW to detect the polarized light from Regulus, one of the brightest stars in the night sky..

TITLE: Polarization due to rotational distortion in the bright star Regulus

AUTHOR: Daniel V. Cotton, Jeremy Bailey, Ian D. Howarth, Kimberly Bott, Lucyna Kedziora-Chudczer, P. W. Lucas & J. H. Hough

PUBLISHED: Nature Astronomy (2017), published online:18 September 2017

DOI: <http://www.nature.com/articles/s41550-017-0238-6>

Inferno world with titanium skies

ABSTRACT: Astronomers using ESO's Very Large Telescope have detected titanium oxide in an exoplanet atmosphere for the first time. This discovery around the hot-Jupiter planet WASP-19b exploited the power of the FORS2 instrument. It provides unique information about the chemical composition and the temperature and pressure structure of the atmosphere of this unusual and very hot world. The results appear today in the journal Nature.

TITLE: Detection of titanium oxide in the atmosphere of a hot Jupiter

AUTHOR: Elyar Sedaghati, Henri M. J. Boffin, Ryan J. MacDonald, Siddharth Gandhi, Nikku Madhusudhan, Neale P. Gibson, Mahmoudreza Oshagh, Antonio Claret & Heike Rauer

PUBLISHED: Nature 549, 238–241 (14 September 2017) - Published online 13 September 2017

DOI: [10.1038/nature23651](https://doi.org/10.1038/nature23651)

NASA-funded research at USC provides evidence of ground-ice on asteroids

ABSTRACT: Research at the USC Viterbi School of Engineering has revealed new evidence for the occurrence of ground ice on the protoplanet Vesta.

TITLE: Orbital bistatic radar observations of asteroid Vesta by the Dawn mission



AUTHOR: Elizabeth M. Palmer, Essam Heggy & Wlodek Kofman

PUBLISHED: Nature Communications 8, Article number: 409 (2017) - Published online:12 September 2017

DOI: [10.1038/s41467-017-00434-6](https://doi.org/10.1038/s41467-017-00434-6)

Science

Ultra-high-energy cosmic rays come from galaxies far, far away

ABSTRACT: A new study reveals that cosmic rays with the highest energies that make their way to Earth originated from outside our Milky Way galaxy.

TITLE: Observation of a large-scale anisotropy in the arrival directions of cosmic rays above 8×10^{18} eV.

AUTHOR:The Pierre Auger Collaboration.

PUBLISHED:Science 22 Sep 2017:Vol. 357, Issue 6357, pp. 1266-1270

DOI: <http://dx.doi.org/10.1126/science.aan4338>

说明

根据天文学十三五规划，天文领域分类如下：

- ✚ 1.恒星与银河系：包含星系介质与恒星形成、恒星结构与演化、致密天体、银河系
- ✚ 2.星系宇宙学；暗物质、暗能量、黑洞
- ✚ 3.天文技术方法和仪器：包含光学红外天文技术、射电天文技术、空间天文技术
- ✚ 4.太阳系和系外行星系统；
- ✚ 5.太阳物理；
- ✚ 6.基本天文：包含天体测量、天体力学、时间频率、相对论基本天文学、基本天文学应用（深空探测与导航、天文地球动力学）