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星系与宇宙学

[Black hole breakthrough: New insight into mysterious jets](#)

ABSTRACT: Advanced simulations created with one of the world's most powerful supercomputers show the jets' streams gradually change direction in the sky, or precess, as a result of space-time being dragged into the rotation of the black hole.

TITLE: Formation of precessing jets by tilted black hole discs in 3D general relativistic MHD simulations

AUTHOR: M Liska, C Hesp, A Tchekhovskoy, A Ingram, M van der Klis, S Markoff

PUBLISHED: Monthly Notices of the Royal Astronomical Society: Letters, Volume 474, Issue 1, 11 February 2018, Pages L81–L85

DOI: <https://doi.org/10.1093/mnrasl/slx174>



[Black hole spin cranks-up radio volume](#)

ABSTRACT: Statistical analysis of supermassive black holes suggests that the spin of the black hole may play a role in the generation of powerful high-speed jets blasting radio waves. By analyzing nearly 8000 quasars from the Sloan Digital Sky Survey, research team found that the oxygen emissions are 1.5 times stronger in radio loud quasars than in radio quiet quasars. This implies that spin is an important factor in the generation of jets.

TITLE: Evidence for Higher Black Hole Spin in Radio-loud Quasars

AUTHOR: Andreas Schulze¹, Chris Done, Youjun Lu, Fupeng Zhang, and Yoshiyuki Inoue

PUBLISHED: The Astrophysical Journal, Volume 849, Number 1

DOI: <https://doi.org/10.3847/1538-4357/aa9181>

[Telescopes team up to study giant galaxy](#)

ABSTRACT: Astronomers have used two Australian radio telescopes and several optical telescopes to study complex mechanisms that are fuelling jets of material blasting away from a black hole 55 million times more massive than the Sun

TITLE: The jet/wind outflow in Centaurus A: a local laboratory for AGN feedback

AUTHOR: B. McKinley, S. J. Tingay, E. Carretti, S. Ellis, J. Bland-Hawthorn, et al

PUBLISHED: Monthly Notices of the Royal Astronomical Society, stx2890

DOI: <https://doi.org/10.1093/mnras/stx2890>

[Galaxy orbits in the local supercluster](#)

ABSTRACT: A team of astronomers from Maryland, Hawaii, Israel and France has produced the most detailed map ever of the orbits of galaxies in our extended local neighborhood, showing the past motions of almost 1,400 galaxies within 100 million light years of the Milky Way. The team reconstructed the galaxies' motions from 13 billion years in the past to the present day.

TITLE: Action Dynamics of the Local Supercluster

AUTHOR: Edward J. Shaya, R. Brent Tully, Yehuda Hoffman, and Daniel Pomarède

PUBLISHED: The Astrophysical Journal, Volume 850, Number 2



DOI: <http://dx.doi.org/10.3847/1538-4357/aa9525>

恒星与银河系

Special star is a Rosetta Stone for understanding the sun's variability and climate effect

ABSTRACT: A large international team of scientists has found a star that can help shed light on the physics underlying the solar dynamo. The team has combined observations from the Kepler spacecraft with ground-based observations as far back as 1978, thereby reconstructing a 7.4-year cycle in this star. The star is almost identical to the Sun, except for the chemical composition. That makes it a Rosetta Stone for the study of stellar dynamos.

TITLE: The Influence of Metallicity on Stellar Differential Rotation and Magnetic Activity

AUTHOR: Christoffer Karoff, et al.

PUBLISHED: The Astrophysical Journal, Volume 852, Number 1

DOI: <https://doi.org/10.3847/1538-4357/aaa026>

[A better way to weigh millions of solitary stars](#)

ABSTRACT: Astronomers have come up with a new and improved method for measuring the masses of millions of solitary stars, especially those with planetary systems.

TITLE: Empirical Accurate Masses and Radii of Single Stars with TESS and Gaia

AUTHOR: Keivan G. Stassun, Enrico Corsaro, Joshua A. Pepper and B. Scott Gaudi

PUBLISHED: 2018 *Astron. J.* 155 22

DOI: <https://doi.org/10.3847/1538-3881/aa998a>



'Winking' star 550 light-years away may be devouring wrecked planets

ABSTRACT: A team of US astronomers studying the star RZ Piscium -- located about 550 light-years away in the constellation Pisces -- has found evidence suggesting its strange, unpredictable dimming episodes may be caused by vast orbiting clouds of gas and dust -- the remains of one or more destroyed planets.

TITLE: Is the Young Star RZ Piscium Consuming Its Own (Planetary) Offspring?

AUTHOR: K. M. Punzi, J. H. Kastner, C. Melis, B. Zuckerman, C. Pilachowski, L. Gingerich, and T. Knapp

PUBLISHED: The Astronomical Journal, Volume 155, Number 1

DOI: <https://doi.org/10.3847/1538-3881/aa9524>

Star mergers: A new test of gravity, dark energy theories

ABSTRACT: Observations and measurements of a neutron star merger have largely ruled out some theories relating to gravity and dark energy, and challenged a large class of theories.

TITLE: Dark Energy After GW170817: Dead Ends and the Road Ahead

AUTHOR: Jose María Ezquiaga and Miguel Zumalacárregui

PUBLISHED: Phys. Rev. Lett. 119, 251304 – Published 18 December 2017

DOI: <https://doi.org/10.1103/PhysRevLett.119.251304>

Neutron-star merger yields new puzzle for astrophysicists

ABSTRACT: The afterglow from the distant neutron-star merger detected last August has continued to brighten - much to the surprise of astrophysicists studying the aftermath of the massive collision that took place about 138 million light years away and sent gravitational waves rippling through the universe. New observations from NASA's orbiting Chandra X-ray Observatory, reported in Astrophysical Journal Letters, indicate that the gamma ray burst unleashed by the collision is more complex than scientists initially imagined.



TITLE: Brightening X-Ray Emission from GW170817/GRB 170817A: Further Evidence for an Outflow

AUTHOR: John J. Ruan, Melania Nynka, Daryl Haggard, Vicky Kalogera, and Phil Evans

PUBLISHED: The Astrophysical Journal Letters, Volume 853, Number 1

DOI: <https://doi.org/10.3847/2041-8213/aaa4f3>

太阳系和系外行星系统

[Titan topographic map unearths cookie-cutter holes in moon's surface](#)

ABSTRACT: Using the now-complete Cassini data set, Cornell University astronomers have created a new global topographic map of Saturn's moon Titan that has opened new windows into understanding its liquid flows and terrain. Two papers, recently published in Geophysical Research Letters, describe the map and discoveries arising from it.

TITLE: Titan's Topography and Shape at the End of the Cassini Mission

AUTHOR: P. Corlies, et al.

PUBLISHED: Geophysical Research Letters, Volume 44, Issue 23, 16 December 2017, Pages 11,754–11,761

DOI: [10.1002/2017GL075518](https://doi.org/10.1002/2017GL075518)

天文技术方法和仪器

[ASU astronomers to build space telescope to explore nearby stars](#)

ABSTRACT: A new ASU-led mission will launch a small satellite telescope into space to study the environment in other solar systems around the Galaxy's most common type of star.



Meeting: 231st American Astronomical Society

USC Viterbi faculty design thermal 'skin' to maintain temperature of satellites

ABSTRACT: If a satellite's temperature is not maintained within its optimal range, its performance can suffer which could mean it could be harder to track wildfires or other natural disasters, your Google maps might not work and your Netflix binge might be interrupted. This might be prevented with a new material recently developed by USC Viterbi School of Engineering engineers.

TITLE: Thermal homeostasis using microstructured phase-change materials

AUTHOR: Shao-Hua Wu, Mingkun Chen, Michael T. Barako, Vladan Jankovic, Philip W.C. Hon, Luke A. Sweatlock, and Michelle L. Povinelli

PUBLISHED: Optica Vol. 4, Issue 11, pp. 1390-1396 (2017)

DOI: <https://doi.org/10.1364/OPTICA.4.001390>

文章推荐

Nature

A 'hot Jupiter' with unusual winds

ABSTRACT: The hottest point on a gaseous planet near a distant star isn't where astrophysicists expected it to be -- a discovery that challenges scientists' understanding of the many planets of this type found in solar systems outside our own.

TITLE: Detection of a westward hotspot offset in the atmosphere of hot gas giant CoRoT-2b

AUTHOR: Lisa Dang, et al.

PUBLISHED: Nature Astronomy (2018)

DOI: <https://doi.org/10.1038/s41550-017-0351-6>



Supermassive black holes control star formation in large galaxies

ABSTRACT: Young galaxies blaze with bright new stars forming at a rapid rate, but star formation eventually shuts down as a galaxy evolves. A new study, published Jan. 1, 2018, in Nature, shows that the mass of the black hole in the center of the galaxy determines how soon this 'quenching' of star formation occurs.

TITLE: Black-hole-regulated star formation in massive galaxies

AUTHOR: Ignacio Martín-Navarro, et al.

PUBLISHED: Nature, Received:23 May 2017 Accepted:28 October 2017 Published online:01 January 2018

DOI: [10.1038/nature24999](https://doi.org/10.1038/nature24999)

Astronomers detect 'whirlpool' movement in earliest galaxies

ABSTRACT: Astronomers have looked back to a time soon after the Big Bang, and have discovered swirling gas in some of the earliest galaxies to have formed in the universe. These 'newborns' -- observed as they appeared nearly 13 billion years ago -- spun like a whirlpool, similar to our own Milky Way. This is the first time that it has been possible to detect movement in galaxies at such an early point in the universe's history.

TITLE: Rotation in [C ii]-emitting gas in two galaxies at a redshift of 6.8

AUTHOR: Renske Smit, et al.

PUBLISHED: Nature 553, 178–181 (11 January 2018)

DOI: [10.1038/nature24631](https://doi.org/10.1038/nature24631)

Giant storms cause palpitations in Saturn's atmospheric heartbeat

ABSTRACT: A University of Leicester scientist leads a Cassini mission study into immense northern storms on Saturn.

TITLE: Disruption of Saturn's quasi-periodic equatorial oscillation by the great northern storm. Leigh N

AUTHOR: Fletcher, Sandrine Guerlet, et al.

PUBLISHED: Nature Astronomy 1, 765 – 770 (2017)



DOI: <http://dx.doi.org/10.1038/s41550-017-0271-5>

Cold suns, warm exoplanets and methane blankets

ABSTRACT: Three billion years ago, the sun shone weaker, but Earth stayed surprisingly warm. Carl Sagan thought a greenhouse effect must have been to thank. A model built on 359 chemical processes has finally arrived at scenarios with a reasonable chance of producing the needed methane on ancient Earth. The model has broad parameters in hope that it may someday be of use to interpret conditions on exoplanets.

TITLE: Effects of primitive photosynthesis on Earth's early climate system

AUTHOR: Kazumi Ozaki, Eiichi Tajika, Peng K. Hong, Yusuke Nakagawa & Christopher T. Reinhard

PUBLISHED: Nature Geoscience (2017)

DOI: [10.1038/s41561-017-0031-2](http://dx.doi.org/10.1038/s41561-017-0031-2)

Supermassive black hole is ahead of its time

ABSTRACT: Observations reveal the mass of earliest known supermassive black hole which radiates from an era in the universe only 690 million years after the Big Bang. Researchers, using unique spectroscopic data from Gemini Near-Infrared Spectrograph (GNIRS) on Gemini North determined its mass at a whopping 800 million times the mass of our sun.

TITLE: An 800-million-solar-mass black hole in a significantly neutral Universe at a redshift of 7.5

AUTHOR: Eduardo Bañados, Bram P. Venemans, et al.

PUBLISHED: Nature

DOI: [10.1038/nature25180](http://dx.doi.org/10.1038/nature25180)

ALMA finds massive primordial galaxies swimming in vast ocean of dark matter

ABSTRACT: ALMA observations push back the epoch of massive-galaxy formation even further by identifying two giant galaxies seen when the universe was only 780 million years old, or about 5 percent its current age.



TITLE: Galaxy growth in a massive halo in the first billion years of cosmic history

AUTHOR: D. P. Marrone, J. S. Spilker, et al.

PUBLISHED: Nature

DOI: [10.1038/nature24629](https://doi.org/10.1038/nature24629)

Gargantua in the mist: A precocious black hole behemoth at the edge of cosmic dawn

ABSTRACT: To understand when supermassive black holes first appeared, astronomers scan the skies for actively-feeding black holes (known as 'quasars') from the Universe's distant past. The latest discovery, by a team led by Eduardo Bañados (Carnegie Observatories) and published today in the journal Nature, is a record-breaker: J1342+0928, the most distant quasar known.

TITLE: An 800-million-solar-mass black hole in a significantly neutral Universe at a redshift of 7.5

AUTHOR: Eduardo Bañados, Bram P. Venemans, et al.

PUBLISHED: Nature

DOI: [10.1038/nature25180](https://doi.org/10.1038/nature25180)

Newly discovered Goliath galaxies from early universe hint at massive dark matter trove

ABSTRACT: A newfound pair of galaxies from the early universe is so massive that it nearly breaks the current understanding of how the cosmos evolved. The larger of the pair is the heftiest galaxy ever seen from the first billion years of the universe. Two galactic giants in such proximity suggest the presence of an enveloping dark matter halo equivalent to 1 trillion times the sun's mass, nearly as large as physically possible at the time.

TITLE: Galaxy growth in a massive halo in the first billion years of cosmic history

AUTHOR: D. P. Marrone, J. S. Spilker, et al.

PUBLISHED: Galaxy growth in a massive halo in the first billion years of cosmic history

DOI: [10.1038/nature24629](https://doi.org/10.1038/nature24629)



Science

Organic molecule benzonitrile detected in space

ABSTRACT: Scientists studying a cold molecular cloud of the Taurus region with radio telescopes have detected the presence of a particular organic molecule called benzonitrile. The finding marks the first time a specific aromatic molecule has been identified in space using radio spectroscopy.

TITLE: Detection of the aromatic molecule benzonitrile (c-C₆H₅CN) in the interstellar medium

AUTHOR: Brett A. McGuire, Andrew M. Burkhardt, et al.

PUBLISHED: Science 12 Jan 2018:Vol. 359, Issue 6372, pp. 202-205

DOI: [10.1126/science.aao4890](https://doi.org/10.1126/science.aao4890)

Saturn's rings cast shadows, affect the planet's ionosphere

ABSTRACT: Data collected by the Cassini spacecraft, before it was deliberately crashed into Saturn's atmosphere in September 2017, show that the planet's illustrious rings are casting a shadow in ionized particles over the planet.

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>

Black holes' magnetism surprisingly wimpy

ABSTRACT: In a paper to be published this week in the journal Science, University of Florida scientists have discovered these tears in the fabric of the universe have significantly weaker magnetic fields than previously thought. A 40-mile-wide black hole 8,000 light years from Earth named V404 Cygni yielded the



first precise measurements of the magnetic field. Study authors found the magnetic energy around the black hole is about 400 times lower than previous crude estimates.

TITLE: A precise measurement of the magnetic field in the corona of the black hole binary V404 Cygni

AUTHOR: Yigit Dallilar, Stephen S. Eikenberry, et al.

PUBLISHED: Science 08 Dec 2017:

DOI: [10.1126/science.aan0249](https://doi.org/10.1126/science.aan0249)

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）