



天文学文献摘要简报

内部资料

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天文学术文献摘要简报



星系与宇宙学

Solving one of nature's great puzzles: What drives the accelerating expansion of the universe?

ABSTRACT: UBC physicists may have solved one of nature's great puzzles: what causes the accelerating expansion of our universe?

PUBLISHED: "How the huge energy of quantum vacuum gravitates to drive the slow accelerating expansion of the Universe", Phys. Rev. D 95, 103504 – Published 11 May 2017

DOI: 10.1103/PhysRevD.95.103504

PUBLIC RELEASE: 15-May-2017

URL: <https://news.ubc.ca/2017/05/15/solving-one-of-natures-great-puzzles-what-drives-the-accelerating-expansion-of-the-universe>

Scientists find giant wave rolling through the Perseus galaxy cluster

ABSTRACT: Combining data from NASA's Chandra X-ray Observatory with radio observations and computer simulations, an international team of scientists has discovered a 200,000-light-year wave of hot gas in the Perseus galaxy cluster.

FUNDER: NASA

PUBLIC RELEASE: "Is there a giant Kelvin-Helmholtz instability in the sloshing cold front of the Perseus cluster?", Mon Not R Astron Soc (2017) 468 (2): 2506-2516.

DOI: 10.1093/mnras/stx640

URL: <https://www.nasa.gov/feature/goddard/2017/scientists-find-giant-wave-rolling-through-the-perseus-galaxy-cluster>

New survey hints at exotic origin for the Cold Spot

ABSTRACT: A supervoid is unlikely to explain a 'Cold Spot' in the cosmic microwave background, according to the results of a new survey, leaving room for exotic explanations like a collision between universes. The



researchers, led by postgraduate student Ruari Mackenzie and Professor Tom Shanks in Durham University's Centre for Extragalactic Astronomy, publish their results in Monthly Notices of the Royal Astronomical Society.

FUNDER : The Science and Technology Facilities Council

PUBLISHED: " Evidence against a supervoid causing the CMB Cold Spot", Monthly Notices of the Royal Astronomical Society. stx931. arXiv:1704.03814

DOI: 10.1093/mnras/stx931

PUBLIC RELEASE: 25-Apr-2017

URL:<http://www.ras.org.uk/news-and-press/2982-new-survey-hints-at-exotic-origin-for-the-cold-spot>

Astrophysicists studied the 'rejuvenating' pulsar in a neighboring galaxy

ABSTRACT: The Lomonosov Moscow State University scientists published the results of a study of the unique ultra-slow pulsar XB091D. This neutron star is believed to have captured a companion only a million years ago and since then, has been slowly restoring its rapid rotation. The young pulsar is located in one of the oldest globular star clusters in the Andromeda galaxy, where the cluster may once have been a dwarf galaxy.

PUBLISHED: " The Slowest Spinning X-Ray Pulsar in an Extragalactic Globular Cluster", The Astrophysical Journal, Volume 839, Number 2

DOI: 10.3847/1538-4357/aa689d

PUBLIC RELEASE: 25-Apr-2017

URL: <http://iopscience.iop.org/article/10.3847/1538-4357/aa689d>



恒星与银河系

Scientists take first tentative steps to explore potential climate of Proxima B

ABSTRACT: The quest to discover whether a planet orbiting our closest neighbouring star, Proxima Centauri (4.2 light years or 25 trillion miles from Earth), has the potential to support life has taken a new, exhilarating twist.

PUBLISHED: "Exploring the climate of Proxima B with the Met Office Unified Model", Volume 601 (May 2017), A&A, 601 (2017) A120

DOI: 10.1051/0004-6361/201630020

PUBLIC RELEASE: 15-May-2017

URL: https://www.aanda.org/articles/aa/full_html/2017/05/aa30020-16/aa30020-16.html

Origin of Milky Way's hypothetical dark matter signal may not be so dark

ABSTRACT: A mysterious gamma-ray glow at the center of the Milky Way is most likely caused by pulsars. The findings cast doubt on previous interpretations of the signal as a potential sign of dark matter.

PUBLISHED: "Characterizing the population of pulsars in the Galactic bulge with the Fermi Large Area Telescope", Astrophysical Journal, arXiv:1705.00009

PUBLIC RELEASE: 2-May-2017

URL: <https://www6.slac.stanford.edu/news/2017-05-02-origin-milky-way-hypothetical-dark-matter-signal-may-not-be-so-dark.aspx>



太阳物理

First direct exploration of magnetic fields in the upper solar atmosphere

ABSTRACT: Scientists have explored the magnetic field in upper solar atmosphere by observing the polarization of ultraviolet light with the CLASP sounding rocket experiment during its 5-minute flight in space on Sept. 3, 2015. The data show that the structures of the solar chromosphere and transition region are more complicated than expected. It is proven that ultraviolet spectropolarimetry can be used in future investigations of the magnetic fields in upper solar chromosphere and transition region.

PUBLISHED: "Discovery of Scattering Polarization in the Hydrogen Ly α Line of the Solar Disk Radiation", The Astrophysical Journal Letters, Volume 839, Number 1

DOI: 10.3847/2041-8213/aa697f

FUNDER: Japan Society for the Promotion of Science KAKENHI, NASA/Low Cost Access to Space, Spanish Ministry of Economy and Competitiveness, Czech Science Foundation, The Academy of Sciences of the Czech Republic, others

PUBLIC RELEASE: 17-May-2017

URL: <http://hinode.nao.ac.jp/en/news/results/170518claspsp/>

UNH researcher identifies key differences in solar wind models

ABSTRACT: The challenge of predicting space weather, which can cause issues with telecommunications and other satellite operations on Earth, requires a detailed understanding of the solar wind (a stream of charged particles released from the sun) and sophisticated computer simulations. Research done at the University of New Hampshire has found that when choosing the right model to describe the solar wind, using the one that takes longer to calculate does not make it the most accurate.

PUBLISHED: "On Kinetic Slow Modes, Fluid Slow Modes, and Pressure-balanced Structures in the Solar Wind", The Astrophysical Journal, Volume 840, Number 2

PUBLIC RELEASE: 10.3847/1538-4357/aa6a56

URL: <https://phys.org/news/2017-05-key-differences-solar.amp>



Space weather model simulates solar storms from nowhere

ABSTRACT: A kind of solar storm has puzzled scientists for its lack of typical warning signs: They seem to come from nowhere, and scientists call them stealth CMEs. Now, scientists have developed a model simulating their evolution.

PUBLISHED: "A model for stealth coronal mass ejections", Journal of Geophysical Research, Volume 121, Issue 11, November 2016, Pages 10,677–10,697

DOI: 10.1002/2016JA023432

PUBLIC RELEASE: 8-May-2017

URL: <https://www.nasa.gov/feature/goddard/2017/space-weather-model-simulates-solar-storms-from-nowhere>

太阳系和系外行星系统

ALMA eyes icy ring around young planetary system

ABSTRACT: ALMA has made the first complete millimeter-wavelength image of the ring of dusty debris surrounding the young star Fomalhaut. This remarkably well-defined band of rubble and gas is likely the result of exocomets smashing together near the outer edges of a planetary system 25 light-years from Earth.

PUBLISHED: "A complete ALMA map of the Fomalhaut debris disk", the Astrophysical Journal, 2017, arXiv170505867M

DOI: arXiv170505867M

PUBLIC RELEASE: 18-May-2017

URL: <https://public.nrao.edu/news/2017-alma-ring-fomalhaut/>

NASA mission uncovers a dance of electrons in space

ABSTRACT: NASA's MMS mission studies how electrons spiral and dive around the planet in a complex dance dictated by the magnetic and electric fields, and a new study revealed a bizarre new type of motion exhibited by these electrons.

FUNDER: NASA



PUBLISHED: "Electron diffusion region during magnetopause reconnection with an intermediate guide field: Magnetospheric multiscale observations", Journal of Geophysical Research:space Physics

DOI: 10.1002/2017JA024004

PUBLIC RELEASE: 18-May-2017

URL: <https://www.nasa.gov/feature/goddard/2017/nasa-mission-uncovers-dance-of-electrons-in-space>

How hard did it rain on Mars?

ABSTRACT: Heavy rain on Mars reshaped the planet's impact craters and carved out river-like channels in its surface billions of years ago, according to a new study published in Icarus. In the paper, researchers from the Smithsonian Institution and the Johns Hopkins University Applied Physics Laboratory show that changes in the atmosphere on Mars made it rain harder and harder, which had a similar effect on the planet's surface as we see on Earth.

PUBLISHED: "The changing nature of rainfall during the early history of Mars", Icarus, Volume 293, 1 September 2017, Pages 172–179

DOI: 10.1016/j.icarus.2017.04.013

PUBLIC RELEASE: 16-May-2017

URL: <https://www.elsevier.com/about/press-releases/research-and-journals/how-hard-did-it-rain-on-mars>

New 'styrofoam' planet provides tools in search for habitable planets

ABSTRACT: Researchers at Lehigh University have discovered a new planet orbiting a star 320 light years from Earth that has the density of styrofoam. This 'puffy' exoplanet may hold opportunities for testing atmospheres that will be useful when assessing future planets for signs of life. The research, 'KELT-11b: A Highly Inflated Sub-Saturn Exoplanet Transiting the V=8 Subgiant HD 93396,' appears in The Astronomical Journal May 2017 issue.

PUBLISHED: "KELT-11b: A Highly Inflated Sub-Saturn Exoplanet Transiting the $V=8$ Subgiant HD 93396", The Astronomical Journal, Volume 153, Number 5

DOI: 10.3847/1538-3881/aa6572

PUBLIC RELEASE: 15-May-2017

URL: <http://iopscience.iop.org/article/10.3847/1538-3881/aa6572/meta>



Surprise! When a brown dwarf is actually a planetary mass object

ABSTRACT: Sometimes a brown dwarf is actually a planet -- or planet-like anyway. A team discovered that what astronomers had previously thought was one of the closest brown dwarfs to our own Sun is in fact a planetary mass object.

FUNDER:

PUBLISHED: "SIMP J013656.5+093347 is Likely a Planetary-Mass Object in the Carina-Near Moving Group", The Astrophysical Journal Letters, arXiv:1705.01625

DOI: arXiv:1705.01625

PUBLIC RELEASE: 9-May-2017

URL: <https://phys.org/news/2017-05-brown-dwarf-planetary-mass.amp>

Ancient meteorite impact sparked long-lived volcanic eruptions on Earth

ABSTRACT: Large impacts were common on the early Earth and were likely much more important than previously thought in shaping our planet. The findings raise interest in the possibility of volcanism also shaping similar structures on Mercury, Venus, Mars and the Moon.

PUBLISHED: "Protracted volcanism after large impacts: Evidence from the Sudbury impact basin", Journal of Geophysical Research: Planets, Volume 122, Issue 4, Pages 701–728

DOI: 10.1002/2016JE005085

PUBLIC RELEASE: 3-May-2017

URL: https://www.tcd.ie/news_events/articles/ancient-meteorite-impact-sparked-long-lived-volcanic-eruptions-on-earth/7803

Astronomers confirm nearby star a good model of our early solar system

ABSTRACT: Iowa State University's Massimo Marengo is part of a research team that has confirmed a nearby star's planetary system contains separate belts of asteroids, similar to our own solar system. The star



is also about one-fifth the age of our sun. All that makes this star a good model of the early days of our solar system. The findings have just been published by The Astronomical Journal.

FUNDER: NASA, German Research Foundation

PUBLISHED: "The Inner 25 au Debris Distribution in the ϵ Eri System", The Astronomical Journal, Volume 153, Number 5

PUBLIC RELEASE: 2-May-2017

DOI: 10.3847/1538-3881/aa696b

URL: <http://www.news.iastate.edu/news/2017/05/02/eridani>

First global simulation yields new insights into ring system

ABSTRACT: A team of researchers in Japan modeled the two rings around Chariklo, the smallest body in the Solar System known to have rings. This is the first time an entire ring system has been simulated using realistic sizes for the ring particles. The simulation revealed that the ring particles are much smaller than predicted or that an undiscovered shepherd satellite around Chariklo is stabilizing the ring.

PUBLISHED: "Simulating the Smallest Ring World of Chariklo", The Astrophysical Journal Letters, Volume 837, Number 1

DOI: 10.3847/2041-8213/aa6256

PUBLIC RELEASE: 27-Apr-2017

URL: <http://www.cfca.nao.ac.jp/en/pr/20170428>

NASA's Fermi catches gamma-ray flashes from tropical storms

ABSTRACT: A thousand times a day, thunderstorms around the globe launch fleeting bursts of gamma rays. Now scientists have studied dozens of these events fired off by Earth's biggest weather: tropical storms, hurricanes and typhoons.

FUNDER: NASA

PUBLISHED: "Terrestrial gamma ray flashes due to particle acceleration in tropical storm systems", Journal of Geophysical Research: Atmospheres, Volume 122, Issue 6, 27 March 2017, Pages 3374–3395

DOI: 10.1002/2016JD025799

PUBLIC RELEASE: 24-APR-2017



URL: <https://www.nasa.gov/feature/goddard/2017/nasas-fermi-catches-gamma-ray-flashes-from-tropical-storms>

文章推荐

Nature

Caltech chemical engineer explains oxygen mystery on comets

ABSTRACT: A Caltech chemical engineer who normally develops new ways to fabricate microprocessors in computers has figured out how to explain a nagging mystery in space -- why comets expel oxygen gas, the same gas we humans breathe.

PUBLISHED: "Dynamic molecular oxygen production in cometary comae", Article number: 15298 (2017)

PUBLIC RELEASE: 8-May-2017

URL: https://www.eurekalert.org/pub_releases/2017-05/ciot-cce050417.php

Astrophysicists discovered a star polluted by calcium

ABSTRACT: An international team of astrophysicists led by a scientist from the Sternberg Astronomical Institute of the Lomonosov Moscow State University reported the discovery of a binary solar-type star inside the supernova remnant RCW 86. Spectroscopic observation of this star revealed that its atmosphere is polluted by heavy elements ejected during the supernova explosion that produced RCW 86.

PUBLISHED: "A solar-type star polluted by calcium-rich supernova ejecta inside the supernova remnant RCW 86", Nature Astronomy 1, Article number: 0116 (2017)

DOI: 10.1038/s41550-017-0116

PUBLIC RELEASE: 28-Apr-2017

URL: <https://www.nature.com/articles/s41550-017-0116>



Scientists propose mechanism to describe solar eruptions of all sizes

ABSTRACT: From long jets to massive explosions of solar material and energy, eruptions on the sun come in many shapes and sizes. Scientists now propose that a universal mechanism can explain the whole spectrum of solar eruptions.

FUNDER: NASA

PUBLISHED: "A universal model for solar eruptions", Nature 544, 452–455 (27 April 2017)

DOI: 10.1038/nature22050

PUBLIC RELEASE: 26-Apr-2017

URL: <https://www.nasa.gov/feature/goddard/2017/scientists-propose-mechanism-to-describe-solar-eruptions-of-all-sizes>

Sun's eruptions might all have same trigger

ABSTRACT: Large and small scale solar eruptions might all be triggered by a single process, according to new research that leads to better understanding of the sun's activity.

FUNDER: NASA, Royal Astronomical Society

PUBLISHED: "A universal model for solar eruptions", Nature 544, 452–455

DOI: 10.1038/nature22050

PUBLIC RELEASE: 26-Apr-2017

URL: <http://www.nature.com/nature/journal/v544/n7651/full/nature22050.html>

SwRI-led team discovers lull in Mars' giant impact history

ABSTRACT: From the earliest days of our solar system's history, collisions between astronomical objects have shaped the planets and changed the course of their evolution. Studying the early bombardment history of Mars, scientists at Southwest Research Institute (SwRI) and the University of Arizona have discovered a 400-million-year lull in large impacts early in Martian history.

FUNDER: NASA's Solar System Exploration Research Virtual Institute, Institute of the Science of Exploration Targets



PUBLISHED: "A post-accretionary lull in large impacts on early Mars", Nature Geoscience 10, 344–348 (2017)

DOI: 10.1038/ngeo2937

PUBLIC RELEASE: 25-Apr-2017

URL: <http://www.swri.org/lull-mars-giant-impact-history>

NASA's Cassini, Voyager missions suggest new picture of sun's interaction with galaxy

ABSTRACT: New data from three NASA missions show that the heliosphere -- the bubble of the sun's magnetic influence that surrounds the inner solar system -- may be much more compact and rounded than previously thought.

FUNDER: NASA

PUBLISHED: "The bubble-like shape of the heliosphere observed by Voyager and Cassini", Nature Astronomy 1, Article number: 0115(2017)

DOI: 10.1038/s41550-017-0115

PUBLIC RELEASE: 24-APR-2017

URL: <https://www.nasa.gov/feature/goddard/2017/nasa-s-cassini-voyager-missions-suggest-new-picture-of-sun-s-interaction-with-galaxy>

Science

Study finds history of Titan's landscape resembles that of Mars, not Earth

ABSTRACT: In a paper published in Science, researchers report that Titan, like Mars but unlike Earth, has not undergone any active plate tectonics in its recent past. The upheaval of mountains by plate tectonics deflects the paths that rivers take. The team found that this telltale signature was missing from river networks on Mars and Titan.

FUNDER: NASA

PUBLISHED: "Global drainage patterns and the origins of topographic relief on Earth, Mars, and Titan",



Science 19 May 2017:Vol. 356, Issue 6339, pp. 727-731

DOI: 10.1126/science.aag0171

PUBLIC RELEASE: 18-May-2017

URL: <https://phys.org/news/2017-05-history-titan-landscape-resembles-mars.amp>

Deciphering the fluid floorplan of a planet

ABSTRACT: An assessment of ancient drainage systems on Earth, Mars and Titan provides new insights into the topography-generating mechanisms on planetary bodies.

PUBLISHED:" Global drainage patterns and the origins of topographic relief on Earth, Mars, and Titan", Science 19 May 2017:Vol. 356, Issue 6339, pp. 727-731

DOI: 10.1126/science.aag0171

PUBLIC RELEASE: 18-May-2017

URL: <http://science.sciencemag.org/content/356/6339/727>

Primitive atmosphere discovered around 'Warm Neptune'

ABSTRACT: A pioneering new study uncovering the 'primitive atmosphere' surrounding a distant world could provide a pivotal breakthrough in the search to how planets form and develop in far-flung galaxies.

PUBLISHED:" HAT-P-26b: A Neptune-mass exoplanet with a well-constrained heavy element abundance", Science ,12 May 2017,Vol. 356, Issue 6338, pp. 628-631

DOI: 10.1126/science.aah4668

PUBLIC RELEASE: 11-May-2017

URL: <https://phys.org/news/2017-05-primitive-atmosphere-neptune.amp>

A watery exoplanet of unexpected composition -- and perhaps origin

ABSTRACT: Astronomers have discovered that a Neptune-sized planet orbiting another star has an atmosphere containing water and clouds. While thousands of exoplanets have been discovered to date, little is known about their atmospheres, especially for bodies smaller than Jupiter.



PUBLISHED: "HAT-P-26b: A Neptune-mass exoplanet with a well-constrained heavy element abundance", Science 12 May 2017, Vol. 356, Issue 6338, pp. 628-631 Hannah R. Wakeford NASA Goddard Space Flight Center, 8800 Greenbelt Road, Greenbelt, MD 20771, USA.

DOI: 10.1126/science.aah4668

PUBLIC RELEASE: 11-May-2017

URL: <http://science.sciencemag.org/content/356/6338/628>

Ripples in the cosmic web

ABSTRACT: A team of astronomers has made the first measurements of small-scale ripples in primeval hydrogen gas using rare double quasars.

PUBLISHED: "Measurement of the small-scale structure of the intergalactic medium using close quasar pairs", Science 28 Apr 2017: Vol. 356, Issue 6336, pp. 418-422

DOI: 10.1126/science.aaf9346

PUBLIC RELEASE: 27-Apr-2017

URL: <http://www.news.ucsb.edu/2017/017911/ripples-cosmic-web>

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）