



天文学文献摘要简报

内部资料

2017 年 8 月

(第六期)

总第九期

中国科学院上海天文台信息中心图书馆



本期目录

星系与宇宙学.....	3
New 3-D simulations show how galactic centers cool their jets	3
Galactic winds push researchers to probe galaxies at unprecedented scale	4
New theory on the origin of dark matter	4
UCI celestial census indicates that black holes pervade the universe.....	4
Primordial black holes may have helped to forge heavy elements.....	5
Dark Energy Survey reveals most accurate measurement of universe's dark matter.....	5
恒星与银河系.....	6
Running out of gas: Gas loss puts brakes on stellar baby boom	6
Astronomers discover 'heavy metal' supernova rocking out.....	6
Milky Way's origins are not what they seem	7
太阳物理.....	7
NASA watches the Sun put a stop to its own eruption	7
Our solar system's 'shocking' origin story.....	8
ESA, NASA's SOHO reveals rapidly rotating solar core	8
Astronomers find that the sun's core rotates 4 times faster than its surface	9
太阳系和系外行星系统	9
Successful filming of fastest aurora flickering	9
天文技术方法和仪器.....	10
NASA's ICESat-2 Preps for Laser Tests.....	10
Sensing technology takes a quantum leap with RIT photonics research.....	10
NASA and Norway to develop Arctic laser-ranging station	10
Cutting-edge adaptive optics facility sees first light	11
Researchers discover shortcut to satellite-based quantum encryption network.....	11
文章推荐.....	12
Nature.....	12
The mystery of the pulsating blue stars.....	12
Scientists probe the conditions of stellar interiors to measure nuclear reactions	12
New clue to solving the mystery of the sun's hot atmosphere.....	13



Researchers detect exoplanet with glowing water atmosphere	13
Black holes are formed as a result of the most powerful explosions in the universe	14
Gamma-ray burst captured in unprecedented detail	14
Venus's turbulent atmosphere	15
Science	15
Moon's magnetic field lasted far longer than once believed	15
SwRI part of international team identifying primordial asteroids	15
Ancient asteroid family unveils the early solar system	16
World's smallest neutrino detector finds big physics fingerprint	16
说明	17

星系与宇宙学

New 3-D simulations show how galactic centers cool their jets

ABSTRACT: Scientists at Berkeley Lab and Purdue University developed new theories and 3-D simulations to explain what's at work in the mysterious jets of energy and matter beaming from the center of galaxies at nearly the speed of light.

PUBLISHED: Rodolfo Barniol Duran et al. Simulations of AGN jets: magnetic kink instability versus conical shocks. Monthly Notices of the Royal Astronomical Society (2017).

DOI: [10.1093/mnras/stx1165](https://doi.org/10.1093/mnras/stx1165)

PUBLIC RELEASE: 14-Aug-2017

URL: <https://phys.org/news/2017-08-d-simulations-galactic-centers-cool.amp>



Galactic winds push researchers to probe galaxies at unprecedented scale

ABSTRACT: After using the Titan supercomputer at Oak Ridge National Laboratory to rule out a potential mechanism for galactic wind, UC Santa Cruz astrophysicist Brant Robertson and University of Arizona graduate student Evan Schneider, now a Hubble Fellow at Princeton University, are aiming to generate nearly a trillion-cell simulation of an entire galaxy, which would be the largest simulation of a galaxy ever.

PUBLISHED: Evan E. Schneider and Brant E. Robertson. HYDRODYNAMICAL COUPLING OF MASS AND MOMENTUM IN MULTIPHASE GALACTIC WINDS. The Astrophysical Journal, Volume 834, Number 2

DOI: <http://dx.doi.org/10.3847/1538-4357/834/2/144>

PUBLIC RELEASE: 10-Aug-2017

URL: <https://www.olcf.ornl.gov/2017/08/08/galactic-winds-push-researchers-to-probe-galaxies-at-unprecedented-scale/>

New theory on the origin of dark matter

ABSTRACT: Scientists at Johannes Gutenberg University Mainz in Germany have come up with a new theory on how dark matter may have been formed shortly after the origin of the universe. This new model proposes an alternative to the WIMP paradigm that is the subject of various experiments in current research.

PUBLISHED: Michael J. Baker and Joachim Kopp. Dark Matter Decay between Phase Transitions at the Weak Scale. Phys. Rev. Lett. 119, 061801 – Published 7 August 2017

DOI: <https://doi.org/10.1103/PhysRevLett.119.061801>

PUBLIC RELEASE: 8-Aug-2017

URL: http://www.uni-mainz.de/presse/aktuell/2360_ENG_HTML.php

UCI celestial census indicates that black holes pervade the universe

ABSTRACT: After conducting a cosmic inventory of sorts to calculate and categorize stellar-remnant black



holes, astronomers from the University of California, Irvine have concluded that there are probably tens of millions of the enigmatic, dark objects in the Milky Way -- far more than expected.

PUBLISHED: Oliver D. Elbert, James S. Bullock, Manoj Kaplinghat. Counting Black Holes: The Cosmic Stellar Remnant Population and Implications for LIGO. Monthly Notices of the Royal Astronomical Society, stx1959

DOI: <https://doi.org/10.1093/mnras/stx1959>

PUBLIC RELEASE: 8-Aug-2017

URL: <https://academic.oup.com/mnras/article/doi/10.1093/mnras/stx1959/4060726/Counting-Black-Holes-The-Cosmic-Stellar-Remnant?guestAccessKey=d1a72ca6-9200-4dca-850a-f4c87663106e>

Primordial black holes may have helped to forge heavy elements

ABSTRACT: Astronomers like to say we are the byproducts of stars, stellar furnaces that long ago fused hydrogen and helium into the elements needed for life through the process of stellar nucleosynthesis.

PUBLIC RELEASE: George M. Fuller, Alexander Kusenko, and Volodymyr Takhistov. Primordial Black Holes and r -Process Nucleosynthesis. Physical Review Letters, 119, 061101 – Published 7 August 2017

DOI: <https://doi.org/10.1103/PhysRevLett.119.061101>

PUBLIC RELEASE: 4-Aug-2017

URL: <https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.119.061101>

Dark Energy Survey reveals most accurate measurement of universe's dark matter

ABSTRACT: Dark Energy Survey scientists have unveiled the most accurate measurement ever made of the present large-scale structure of the universe. These measurements of the amount and 'clumpiness' (or distribution) of dark matter in the present-day cosmos were made with a precision that, for the first time, rivals that of inferences from the early universe by the European Space Agency's orbiting Planck observatory.

MEETING: American Physical Society Division of Particles and Fields Meeting

FUNDER : US Department of Energy Office of Science

PUBLIC RELEASE: 3-Aug-2017

URL: <http://news.fnal.gov/2017/08/dark-energy-survey-reveals-accurate-measurement-dark-matter->



恒星与银河系

Running out of gas: Gas loss puts brakes on stellar baby boom

ABSTRACT: Astronomers observed a galaxy cluster 9.4 billion light-years away using the ALMA radio telescope array and found evidence that hot gas strips away the cold gas in the member galaxies. Since cold gas is the material for forming new stars, removing the cold gas inhibits star formation. This result is key to understanding the declining birthrate of stars throughout the history of the Universe and the evolutionary process of galaxy clusters.

FUNDER: Japan Society for the Promotion of Science, Ministry of Education, Culture, Sports, Science and Technology of Japan

PUBLISHED: Masao Hayashi¹, Tadayuki Kodama^{1,2,3}, Kotaro Kohno^{4,5}, Yuki Yamaguchi⁴, et al. Evolutionary Phases of Gas-rich Galaxies in a Galaxy Cluster at $z = 1.46$. The Astrophysical Journal Letters, Volume 841, Number 2 PUBLIC RELEASE: 2-Aug-2017

DOI: [arXiv:1705.02567](#)

URL: <https://alma-telescope.jp/en/news/press/z146-201708>

Astronomers discover 'heavy metal' supernova rocking out

ABSTRACT: A team of astronomers led by the Harvard-Smithsonian Center for Astrophysics has discovered that an extraordinarily bright supernova occurred in a surprising location. This 'heavy metal' supernova discovery challenges current ideas of how and where such super-charged supernovas occur. In the past decade, astronomers have discovered about 50 supernovas, out of the thousands known, that are particularly powerful. Following the recent discovery of one of these, the researchers have uncovered vital clues about where some of these extraordinary objects come from.

PUBLISHED: Matt Nicholl, Edo Berger, Raffaella Margutti, Peter K. Blanchard, James Guillochon, Joel Leja, Ryan Chornock .The superluminous supernova SN 2017egm in the nearby galaxy NGC 3191: a metal-rich environment can support a typical SLSN evolution. Astrophysical Journal Letters



DOI: [arXiv:1706.08517](https://doi.org/10.1093/mnras/stx1517)

PUBLIC RELEASE: 31-Jul-2017

URL: <http://lanl.arxiv.org/abs/1706.08517>

Milky Way's origins are not what they seem

ABSTRACT: In a first-of-its-kind analysis, Northwestern University astrophysicists have discovered that up to half of the matter in our Milky Way galaxy may come from distant galaxies. As a result, each one of us may be made in part from extragalactic matter. Using supercomputer simulations, the researchers found an unexpected mode for how galaxies acquired matter: intergalactic transfer. Supernova explosions eject copious amounts of gas from galaxies, causing atoms to be transported from one galaxy to another via powerful galactic winds.

PUBLISHED: Daniel Anglés-Alcázar, Claude-André Faucher-Giguère, Dušan Kereš, Philip F. Hopkins, Eliot Quataert, et al. The cosmic baryon cycle and galaxy mass assembly in the FIRE simulations. Monthly Notices of the Royal Astronomical Society, Volume 470, Issue 4, 1 October 2017, Pages 4698–4719

DOI: <https://doi.org/10.1093/mnras/stx1517>

FUNDER: NASA, National Science Foundation, Northwestern's Center for Interdisciplinary Exploration and Research in Astrophysics

PUBLIC RELEASE: 26-Jul-2017

URL: https://academic.oup.com/mnras/search-results?page=1&q=The%20Cosmic%20Baryon%20Cycle%20and%20Galaxy%20Mass%20Assembly%20in%20the%20FIRE%20Simulations&fl_SiteID=5326&allJournals=1&SearchSourceType=1

太阳物理

NASA watches the Sun put a stop to its own eruption

ABSTRACT: On Sept. 30, 2014, multiple NASA observatories watched a failed solar eruption. Because scientists had so many eyes on the event, they were able to explain how the Sun's magnetic landscape shredded its own eruption.



PUBLISHED: Georgios Chintzoglou, Angelos Vourlidas, Antonia Savcheva, Svetlin Tassev. Magnetic Flux Rope Shredding By a Hyperbolic Flux Tube: The Detrimental Effects of Magnetic Topology on Solar Eruptions. The Astrophysical Journal, Volume 843, Number 2

DOI: [10.3847/1538-4357/835/2/200](https://doi.org/10.3847/1538-4357/835/2/200)

PUBLIC RELEASE: 11-Aug-2017

URL: <https://www.nasa.gov/feature/goddard/2017/nasa-watches-the-sun-put-a-stop-to-its-own-eruption>

Our solar system's 'shocking' origin story

ABSTRACT: According to one longstanding theory, our solar system's formation was triggered by a shock wave from an exploding supernova. It injected material from the exploding star into a neighboring cloud of dust and gas, causing it to collapse in on itself and form the sun and its surrounding planets. New work offers fresh evidence supporting this theory, modeling the solar system's formation beyond the initial cloud collapse and into the intermediate stages of star formation.

PUBLISHED: Alan P. Boss. Triggering Collapse of the Presolar Dense Cloud Core and Injecting Short-Lived Radioisotopes with a Shock Wave. V. Nonisothermal Collapse Regime. Astrophysical Journal, arXiv:1706.09840

DOI: [10.3847/1538-4357/aa7cf4](https://doi.org/10.3847/1538-4357/aa7cf4)

PUBLIC RELEASE: 3-Aug-2017

URL: <https://www.sciencedaily.com/releases/2017/08/170803103134.htm>

ESA, NASA's SOHO reveals rapidly rotating solar core

ABSTRACT: After four decades of searching, solar scientists have at long last found evidence of a type of seismic wave in our Sun, thanks to ESA and NASA's Solar and Heliospheric Observatory, or SOHO.

PUBLISHED: E. Fossat¹, P. Boumier², T. Corbard¹, J. Provost¹, D. Salabert³, F. X. Schmider¹, et al. Asymptotic g modes: Evidence for a rapid rotation of the solar core. Astronomy & Astrophysics on Aug. 1, 2017

DOI: <https://doi.org/10.1051/0004-6361/201730460>

PUBLIC RELEASE: 1-Aug-2017

URL: <https://doi.org/10.1051/0004-6361/201730460>



Astronomers find that the sun's core rotates 4 times faster than its surface

ABSTRACT: The sun's core rotates nearly four times faster than the sun's surface, an international team of astronomers reports in the journal *Astronomy & Astrophysics*. The most likely explanation is that this core rotation is left over from the period when the sun formed, some 4.6 billion years ago.

PUBLISHED: E. Fossat¹, P. Boumier², T. Corbard¹, J. Provost¹, D. Salabert³, F. X. Schmider¹, A. H. Gabriel², G. Grec¹, C. Renaud¹, J. M. Robillot⁴, T. Roca-Cortés^{5,6}, S. Turck-Chièze⁷, R. K. Ulrich⁸ and M. Lazrek. Asymptotic *g* modes: Evidence for a rapid rotation of the solar core. *Astronomy & Astrophysics*, 604, A40 (2017),

DOI: <https://doi.org/10.1051/0004-6361/201730460>

PUBLIC RELEASE: 31-Jul-2017

URL: <https://doi.org/10.1051/0004-6361/201730460>

太阳系和系外行星系统

Successful filming of fastest aurora flickering

ABSTRACT: Researchers conducted a 3 year continuous high-speed imaging observation at Poker Flat Research Range, Alaska, USA, and identified the physics behind the flickering of aurora. At the same time, they discovered faster flickerings at speeds of 1/60-1/50 and 1/80 of a second.

PUBLISHED: Yoko Fukuda, Ryuho Kataoka, Herbert Akihito Uchida, Yoshizumi Miyoshi, et al. First evidence of patchy flickering aurora modulated by multi-ion electromagnetic ion cyclotron waves. *Geophysical Research Letters*. Volume 44, Issue 9, Pages 3963–3970

FUNDER: KAKENHI, The Institute for Space-Earth Environmental Research, Nagoya University, The Yamada Science Foundation

DOI: <http://dx.doi.org/10.1002/2017GL072956>

PUBLIC RELEASE: 9-Aug-2017

URL: <http://dx.doi.org/10.1002/2017GL072956>



天文技术方法和仪器

NASA's ICESat-2 Preps for Laser Tests

ABSTRACT: Lasers that will fly on NASA's Ice, Cloud and land Elevation Satellite-2, or ICESat-2, are about to be put to the test at the agency's Goddard Space Flight Center in Greenbelt, Maryland.

They are a part of the sole ICESat-2 instrument — the Advanced Topographic Laser Altimeter System (ATLAS) — that will measure the elevation of ice sheets, sea ice and glaciers by sending fast-firing laser pulses to the surface and timing how long it takes individual photons to return. With a scheduled launch date of 2018, the instrument now faces several months of testing at Goddard in which engineers will ensure it is ready to operate in the harsh environment of space. This is an intermediate stage of ICESat-2's testing regimen, and will focus on the flight lasers.

PUBLIC RELEASE:17-Aug-2017

URL: <https://www.nasa.gov/feature/goddard/2017/nasa-and-norway-to-develop-arctic-station>

Sensing technology takes a quantum leap with RIT photonics research

ABSTRACT: Research underway at RIT advances a new kind of sensing technology that captures data with better precision than currently possible and promises cheaper, smaller and lighter sensor designs.

FUNDER: Office of Naval Research

PUBLIC RELEASE: 9-Aug-2017

URL: <http://www.rit.edu/news/story.php?id=62861>

NASA and Norway to develop Arctic laser-ranging station

ABSTRACT: NASA and the Norwegian Mapping Authority are partnering to develop a state-of-the-art satellite laser ranging station 650 miles from the North Pole that will produce high-precision locations of orbiting satellites, help track changes in the ice sheets and improve the efficiency of marine transportation and agriculture.

PUBLIC RELEASE: 7-Aug-2017



URL: <https://www.nasa.gov/feature/goddard/2017/nasa-and-norway-to-develop-arctic-station>

Cutting-edge adaptive optics facility sees first light

ABSTRACT: The Adaptive Optics Facility (AOF) is a long-term project on ESO's Very Large Telescope (VLT - <https://www.eso.org/public/teles-instr/vlt/>) to provide an adaptive optics system for the instruments on Unit Telescope 4 (UT4), the first of which is MUSE (the Multi Unit Spectroscopic Explorer - <https://www.eso.org/public/teles-instr/vlt/vlt-instr/muse/>) [1]. [Adaptive optics](#) works to compensate for the blurring effect of the Earth's atmosphere, enabling MUSE to obtain much sharper images and resulting in twice the contrast previously achievable. MUSE can now study even fainter objects in the Universe.

PUBLIC RELEASE: 2-Aug-2017

URL: <http://www.eso.org/public/news/eso1724/>

Researchers discover shortcut to satellite-based quantum encryption network

ABSTRACT: In a new study, researchers demonstrate ground-based measurements of quantum states sent by a laser aboard a satellite 38,000 kilometers above Earth. This is the first time that quantum states have been measured so carefully from so far away.

PUBLISHED: Kevin Günthner, Imran Khan, Dominique Elser, et al. Quantum-limited measurements of optical signals from a geostationary satellite. *Optica*. Vol. 4, Issue 6, pp. 611-616(2017)

DOI: <https://doi.org/10.1364/OPTICA.4.000611>

PUBLIC RELEASE: 15-Jun-2017

URL: <https://www.osapublishing.org/optica/abstract.cfm?uri=optica-4-6-611>



文章推荐

Nature

The mystery of the pulsating blue stars

ABSTRACT: In the middle of the Chilean Atacama desert, a team of Polish astronomers are monitoring millions of celestial bodies. In 2013, the team was surprised when they discovered, in the course of their survey, stars that pulsated much faster than expected. In the following years, the team that included an astronomer from the Astronomical Institute of Friedrich-Alexander-Universität Erlangen-Nürnberg, studied these stars in more detail and concluded that they had stumbled upon a new class of variable star.

PUBLISHED: Paweł Pietrukowicz, Wojciech A. Dziembowski, Marilyn Latour, Rodolfo Angeloni, Radosław Poleski, et al. Blue large-amplitude pulsators as a new class of variable stars. Nature Astronomy 1, Article number: 0166

DOI: <http://dx.doi.org/10.1038/s41550-017-0166>

PUBLIC RELEASE: 9-Aug-2017

URL: <https://www.fau.eu/2017/07/25/news/research/the-mystery-of-the-pulsating-blue-stars/>

Scientists probe the conditions of stellar interiors to measure nuclear reactions

ABSTRACT: Most of the nuclear reactions that drive the nucleosynthesis of the elements in our universe occur in very extreme stellar plasma conditions. This intense environment found in the deep interiors of stars has made it nearly impossible for scientists to perform nuclear measurements in these conditions -- until now.

PUBLISHED: D. T. Casey et al. Thermonuclear reactions probed at stellar-core conditions with laser-based inertial-confinement fusion. Nature Physics (2017).

DOI: [10.1038/nphys4220](https://doi.org/10.1038/nphys4220)

PUBLIC RELEASE: 7-Aug-2017

URL: <https://www.llnl.gov/news/scientists-probe-conditions-stellar-interiors-measure-nuclear-reactions>



New clue to solving the mystery of the sun's hot atmosphere

ABSTRACT: The elemental composition of the Sun's hot atmosphere known as the 'corona' is strongly linked to the 11-year solar magnetic activity cycle, a team of scientists from UCL, George Mason University and Naval Research Laboratory has revealed for the first time.

PUBLISHED: David H. Brooks, Deborah Baker, Lidia van Driel-Gesztelyi & Harry P. Warren. A Solar cycle correlation of coronal element abundances in Sun-as-a-star observations, Nature Communications 8, Article number: 183 (2017)

DOI: [10.1038/s41467-017-00328-7](https://doi.org/10.1038/s41467-017-00328-7)

PUBLIC RELEASE: 3-Aug-2017

URL: <http://www.nature.com/articles/s41467-017-00328-7>

Researchers detect exoplanet with glowing water atmosphere

ABSTRACT: Scientists have found compelling evidence for a stratosphere on an enormous planet outside our solar system. The planet's stratosphere -- a layer of atmosphere where temperature increases with higher altitudes -- is hot enough to boil iron. WASP-121b, located approximately 900 light-years from Earth, is a gas giant exoplanet commonly referred to as a 'hot Jupiter.'

FUNDER: NASA, European Research Council, French National Agency for Research, Spanish Ministry of Economy, Industry and Competitiveness, National Science Foundation, European Space Agency, Royal Astronomical Society, and others

PUBLISHED: Thomas Evans et al. An ultrahot gas-giant exoplanet with a stratosphere. Nature 548, 58–61 (03 August 2017)

DOI: [10.1038/nature23266](https://doi.org/10.1038/nature23266)

PUBLIC RELEASE: 2-Aug-2017

URL: https://www.eurekalert.org/pub_releases/2017-08/uom-rde080217.php



Black holes are formed as a result of the most powerful explosions in the universe

ABSTRACT: Scientists from the Lomonosov Moscow State University have managed to register for the first time polarization of intrinsic optical radiation of gamma-ray bursts -- the most powerful and very short bursts in the Universe, which last for several tens of seconds. Under intrinsic radiation of gamma-ray bursts one understands optical radiation at the instant of explosion. Such observations pose an extremely complicated science-and-technology task since the explosion lasts less than several minutes.

PUBLISHED: E. Troja,V. M. Lipunov,C. G. Mundell,N. R. Butler,A. M. Watson,S. Kobayashi, et al. Significant and variable linear polarization during the prompt optical flash of GRB 160625B. Nature 547,425–427 (27 July 2017)

DOI: [10.1038/nature23289](https://doi.org/10.1038/nature23289)

PUBLIC RELEASE: 1-Aug-2017

URL: <http://dx.doi.org/10.1038/nature23289>

Gamma-ray burst captured in unprecedented detail

ABSTRACT: Using a wide array of ground- and space-based telescope observations, an international team led by University of Maryland astronomers constructed one of the most detailed descriptions of a gamma-ray burst to date. The event, named GRB160625B, revealed key details about the initial "prompt" phase of gamma-ray bursts and the evolution of the large jets of matter and energy that form as a result of the burst.

FUNDER: NASA, El Consejo Nacional de Ciencia y Tecnología - Mexico, National Autonomous University of Mexico, Russian Science Foundation, United Kingdom Space Agency

PUBLISHED: Eleonora Troja et al. Significant and variable linear polarization during the prompt optical flash of GRB 160625B. Nature547,425–427(27 July 2017)

DOI: [10.1038/nature23289](https://doi.org/10.1038/nature23289)

PUBLIC RELEASE: 26-Jul-2017

URL: <http://www.nature.com/nature/journal/v547/n7664/full/nature23289.html?foxtrotcallback=true>



Venus's turbulent atmosphere

ABSTRACT: A research paper published today by Nature Astronomy sheds light on the so far un-explored nightside circulation at the upper cloud level of Venus. Researchers from the Rhenish Institute for Environmental Research at the University of Cologne are part of an international research project which has now presented these first comprehensive findings. They discovered unexpected patterns of slow motion and abundant station-ary waves in Venus's nighttime sky.

PUBLISHED: J. Peralta, R. Hueso, A. Sánchez-Lavega, Y. J. Lee, A. García Muñoz, et al. Stationary waves and slowly moving features in the night upper clouds of Venus. Nature Astronomy 1, Article number: 0187

DOI: [10.1038/s41550-017-0187](https://doi.org/10.1038/s41550-017-0187)

PUBLIC RELEASE: 25-Jul-2017

URL: <https://www.nature.com/articles/s41550-017-0187>

Science

Moon's magnetic field lasted far longer than once believed

ABSTRACT: The moon's magnetic field lasted 1 billion to 2.5 billion years longer than once thought -- a finding with important implications for habitability on other moons and planets throughout the universe, a Rutgers University-New Brunswick professor says.

PUBLISHED: Tikoo, Benjamin P. Weiss, et al. A two-billion-year history for the lunar dynamo. Sonia M. Science Advances 09 Aug 2017:Vol. 3, no. 8, e1700207

DOI: <http://dx.doi.org/10.1126/sciadv.1700207>

PUBLIC RELEASE: 9-Aug-2017

URL: http://news.rutgers.edu/research-news/moon%E2%80%99s-magnetic-field-lasting-far-longer-once-believed/20170801#.WYM_roQrK71

SwRI part of international team identifying primordial asteroids

ABSTRACT: Southwest Research Institute (SwRI) was part of an international team that recently discovered a



relatively unpopulated region of the main asteroid belt, where the few asteroids present are likely pristine relics from early in solar system history. The team used a new search technique that also identified the oldest known asteroid family, which extends throughout the inner region of the main asteroid belt.

PUBLISHED: Marco Delbo', Kevin Walsh, Bryce Bolin, Chrysa Avdellidou, Alessandro Morbidelli, et al. Identification of a primordial asteroid family constrains the original planetesimal population. Science 03 Aug 2017:eaam6036

DOI: [10.1126/science.aam6036](https://doi.org/10.1126/science.aam6036)

PUBLIC RELEASE: 3-Aug-2017

URL: <http://www.swri.org/press-release/international-team-identifying-primordial-asteroids>

Ancient asteroid family unveils the early solar system

ABSTRACT: Astronomers have identified an ancient family of asteroids residing in the Main Belt (the area between Mars and Jupiter) that is nearly as old as the solar system itself, yielding important insights into how the planets and asteroids formed.

PUBLISHED: "Identification of a primordial asteroid family constrains the original planetesimal population", Marco Delbo', Kevin Walsh, Bryce Bolin, Chrysa Avdellidou, Alessandro Morbidelli, Science 03 Aug 2017:eaam6036

DOI: [10.1126/science.aam6036](https://doi.org/10.1126/science.aam6036)

PUBLIC RELEASE: 3-Aug-2017

URL: <http://science.sciencemag.org/content/early/2017/08/02/science.aam6036>

World's smallest neutrino detector finds big physics fingerprint

ABSTRACT: After more than a year of operation at the Department of Energy's Oak Ridge National Laboratory (ORNL), the COHERENT experiment, using the world's smallest neutrino detector, has found a big fingerprint of the elusive, electrically neutral particles that interact only weakly with matter. The research, performed at ORNL's Spallation Neutron Source and published in the journal Science, provides compelling evidence for a neutrino interaction process predicted by theorists 43 years ago, but never seen.

FUNDER: Oak Ridge National Laboratory's Laboratory Directed Research and Development Program, US National Science Foundation, Kavli Institute for Cosmological Physics at the University of Chicago, Kavli



Foundation

PUBLISHED: D. Akimov, J. B. Albert, P. An, C. Awe4,, P. S. Barbeau, B. Becker, V. Belov,et al. Observation of coherent elastic neutrino-nucleus scattering. Science 03 Aug 2017

DOI: [10.1126/science.aao0990](https://doi.org/10.1126/science.aao0990)

PUBLIC RELEASE: 3-Aug-2017

URL: <http://dx.doi.org/10.1126/science.aao0990>

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）