天文学文献摘要简报

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本期目录

星系与宇宙学

Can we see a singularity, the most extreme object in the universe?

ABSTRACT: Scientists at the Tata Institute of Fundamental Research have found new ways to detect a bare or naked singularity, the most extreme object in the universe. This finding has possible astrophysical implications.

FUNDER: Tata Institute of Fundamental Research, Department of Atomic Energy

PUBLISHED: "Spin precession in a black hole and naked singularity spacetimes",Phys. Rev. D 95, 044006 – Published 6 February 2017

DOI: https://doi.org/10.1103/PhysRevD.95.044006

PUBLIC RELEASE: 20-APR-2017

URL: https://journals.aps.org/prd/abstract/10.1103/PhysRevD.95.044006

Penn researchers provide new insight into dark matter halos

ABSTRACT: Researchers at the University of Pennsylvania and the University of Chicago used the Sloan Digital Sky Survey to find evidence that the dark matter halos surrounding galaxies and galaxy clusters have a discernible edge.

PUBLISHED: "The Halo Boundary of Galaxy Clusters in the SDSS", *Astrophysical Journal*
DOI: arXiv:1702.01722

PUBLIC RELEASE: 17-APR-2017

URL: https://news.upenn.edu/news/penn-researchers-provide-new-insight-dark-matter-halos

Scientists make progress on unravelling the puzzle of merging black holes

ABSTRACT: Astrophysicists at the University of Birmingham have made progress in understanding a key

mystery of gravitational-wave astrophysics: how two black holes can come together and merge.

PUBLISHED: "Formation of the first three gravitational-wave observations through isolated binary evolution", Nature Communications 8, Article number: 14906 (2017)

DOI: 10.1038/ncomms14906

PUBLIC RELEASE: 5-APR-2017

Study detects doubly accelerated electrons in collisions of galaxy clusters

ABSTRACT: A cosmic phenomenon resulting from the acceleration of a gas cloud by a black hole and its reacceleration by the shock waves from the merging of two galaxy clusters, has been described by an international collaboration of astronomers. The study enriches scientists' understanding of the universe on the largest scale.

FUNDER: São Paulo Research Foundation

PUBLISHED: "Erratum: The case for electron re-acceleration at galaxy cluster shocks". Nature Astronomy 1, Article number: 0044 (2017)

DOI: 10.1038/s41550-017-0044

PUBLIC RELEASE: 4-APR-2017

Mysterious cosmic explosion surprises astronomers studying the distant x-ray universe

ABSTRACT: A mysterious flash of X-rays has been discovered by NASA's Chandra X-ray Observatory in the deepest X-ray image ever obtained. This source likely comes from some sort of destructive event, but it may be of a variety that scientists have never seen before.

FUNDER: National Commission for Scientific and Technological Research in Chile, The National Fund for Scientific and Technological Development, Ministry of Economy, Development, and Tourism's Millennium Science Initiative, National Science Foundation

PUBLISHED: "A New, Faint Population of X-ray Transients", Mon Not R Astron Soc (2017) 467 (4): 4841-4857

DOI: 10.1093/mnras/stx417

PUBLIC RELEASE: 30-MAR-2017

URL: HTTP://SCIENCE.PSU.EDU/NEWS-AND-EVENTS/2017-NEWS/BRANDT3-2017

Explaining the accelerating expansion of the universe without dark energy

ABSTRACT: Enigmatic dark energy, thought to make up 68 percent of the universe, may not exist at all, according to a Hungarian-American team. The researchers believe that standard models of the universe fail to take account of its changing structure, but that once this is done the need for dark energy disappears. The team publish their results in a paper in Monthly Notices of the Royal Astronomical Society.

PUBLISHED: " Concordance cosmology without dark energy", Mon Not R Astron Soc Lett (2017) 469 (1): L1-L5.

DOI: http://dx.doi.org/10.1093/mnrasl/slx026

PUBLIC RELEASE: 30-MAR-2017

URL:http://www.ras.org.uk/news-and-press/2968-explaining-the-accelerating-expansion-of-the-universe-without-dark-energy

Subaru telescope detects the shadow of a gas cloud in an ancient proto-supercluster

ABSTRACT: By using the Suprime-Cam on the Subaru Telescope, a team led by researchers at Osaka Sangyo University succeeded in making the widest map of neutral hydrogen gas in the early universe (corresponding to a time about 11.5 billion years ago). They found that the neutral hydrogen gas widely spreads out across 160 million light-years in and around the proto-supercluster.

PUBLISHED: " Imaging of diffuse H i absorption structure in the SSA22 protocluster region at $z = 3.1$", Mon Not R Astron Soc (2017) 467 (4): 3951-3962.

DOI: https://doi.org/10.1093/mnras/stx038

PUBLIC RELEASE: 28-MAR-2017

URL: http://subarutelescope.org/Pressrelease/2017/03/28/index.html

Gravitational wave kicks monster black hole out of galactic core

ABSTRACT: Astronomers have uncovered a supermassive black hole that has been propelled out of the center of a distant galaxy by what could be the awesome power of gravitational waves.

FUNDER: NASA

PUBLISHED: "The puzzling case of the radio-loud QSO 3C 186: a gravitational wave recoiling black hole in a young radio source?", Astronomy & Astrophysics

DOI: 10.1051/0004-6361/201629522, arXiv:1611.05501

PUBLIC RELEASE: 23-MAR-2017

URL:HTTPS://WWW.NASA.GOV/FEATURE/GODDARD/2017/GRAVITATIONAL-WAVE-KICKS-MONSTER-BLACK-HOLE-OUT-OF-GALACTIC-CORE

Astronomers find unexpected, dust-obscured star formation in distant galaxy

ABSTRACT: Pushing the limits of the largest single-aperture millimeter telescope in the world, and coupling it with gravitational lensing, University of Massachusetts Amherst astronomer Alexandra Pope and colleagues report that they have detected a surprising rate of star formation, four times higher than previously detected, in a dust-obscured galaxy behind a Frontier Fields cluster.

FUNDER: CONACYT, National Science Foundation, INAOE and UMass Amherst, NASA/Jet Propulsion Laboratory, Hubble Space Telescope Frontier Fields

PUBLISHED: "Early Science with the Large Millimeter Telescope: Detection of Dust Emission in Multiple Images of a Normal Galaxy at $z > 4$ Lensed by a Frontier Fields Cluster", The Astrophysical Journal, Volume 838, Number 2

DOI: https://doi.org/10.3847/1538-4357/aa6573

PUBLIC RELEASE: 23-MAR-2017

URL: http://www.umass.edu/newsoffice/article/umass-amherst-astronomers-find-unexpected

New portal to unveil the dark sector of the universe

ABSTRACT: IBS scientists theorize a new portal to peek into the dark world.

FUNDER: Institute for Basic Science

PUBLISHED: "Portal Connecting Dark Photons and Axions", Phys. Rev. Lett. 118, 101802 – Published 9 March 2017

DOI: https://doi.org/10.1103/PhysRevLett.118.101802

PUBLIC RELEASE: 23-MAR-2017

URL:HTTP://WWW.IBS.RE.KR/COP/BBS/BBSMSTR_000000000738/SELECTBOARDARTICLE.DO?NTTID=14417

Tracing aromatic molecules in the early universe

ABSTRACT: A molecule found in car engine exhaust fumes that is thought to have contributed to the origin of life on Earth has made astronomers heavily underestimate the amount of stars that were forming in the early universe, a University of California, Riverside-led study has found. That molecule is called polycyclic aromatic hydrocarbon. On Earth it is also found in coal and tar. In space, it is a component of dust.

PUBLISHED: "The MOSDEF Survey: Metallicity Dependence of PAH Emission at High Redshift and Implications for 24 μm Inferred IR Luminosities and Star Formation Rates at $z \sim 2$", The Astrophysical Journal, Volume 837, Number 2

DOI: https://doi.org/10.3847/1538-4357/aa619c

PUBLIC RELEASE: 22-Mar-2017

URL: http://www.portaltotheuniverse.org/blogs/posts/view/561600/

Universe's ultraviolet background could provide clues about missing galaxies

ABSTRACT: Astronomers have developed a way to detect the ultraviolet background of the universe, which could help explain why there are so few small galaxies in the cosmos.

PUBLISHED: "A measurement of the $z = 0$ UV background from Hα fluorescence", Mon Not R Astron Soc (2017) 467 (4): 4802-4816.

DOI: https://doi.org/10.1093/mnras/stx398

PUBLIC RELEASE: 21-MAR-2017

URL:HTTP://WWW.RAS.ORG.UK/NEWS-AND-PRESS/2965-UNIVERSE-S-ULTRAVIOLET-BACKGROUND-COULD-PROVIDE-CLUES-ABOUT-MISSING-GALAXIES

恒星与银河系

Supermassive black holes found in 2 tiny galaxies

ABSTRACT: U astronomers and colleagues have found two ultra-compact dwarf galaxies with supermassive black holes, the second and third such galaxies found to harbor the objects. Together, the three examples suggest that black holes lurk at the center of most ultra-compact dwarfs, potentially doubling the number of supermassive black holes known in the universe. The tiny galaxies were likely leftovers of larger galaxies stripped of their outer layers after colliding into other, larger galaxies.

PUBLISHED: "Detection of Supermassive Black Holes in Two Virgo Ultracompact Dwarf Galaxies", The Astrophysical Journal, Volume 839, Number 2

DOI: https://doi.org/10.3847/1538-4357/aa6972

PUBLIC RELEASE: 17-APR-2017

URL: https://unews.utah.edu/supermassive-black-holes-found-in-two-tiny-galaxies/

Collisions generate gas in debris disks

ABSTRACT: By examining the atomic carbon line from two young star systems -- 49 Ceti and Beta Pictoris -- researchers had found atomic carbon in the disk, the first time this observation has been made at sub-millimeter wavelength, hinting that the gas in debris disks is not primordial, but rather is generated from some process of collisions taking place in the debris disk.

PUBLISHED: "Detection of Submillimeter-wave [C i] Emission in Gaseous Debris Disks of 49 Ceti and β Pictoris", The Astrophysical Journal Letters, Volume 839, Number 1

DOI: 10.3847/2041-8213/aa67f4

PUBLIC RELEASE: 12-APR-2017

URL: http://dx.doi.org/10.3847/2041-8213/aa67f4

Image release: ALMA captures explosive star birth

ABSTRACT: Star birth can be a violent and explosive event, as dramatically illustrated in new ALMA images.

PUBLISHED: **"**THE ALMA VIEW OF THE OMC1 EXPLOSION IN ORION**",** The Astrophysical Journal, Volume 837, Number 1

DOI: 10.3847/1538-4357/aa5c8b

PUBLIC RELEASE: 7-APR-2017

URL: https://public.nrao.edu/news/image-release-alma-captures-explosive-star-birth/

Satellite galaxies at edge of Milky Way coexist with dark matter, says RIT study

ABSTRACT: Research conducted by scientists at Rochester Institute of Technology rules out a challenge to the accepted standard model of the universe and theory of how galaxies form by shedding new light on a problematic structure.

PUBLISHED: **"**Is the vast polar structure of dwarf galaxies a serious problem for Λ cold dark matter?**",** Mon Not R Astron Soc (2017) 468 (2): 1671-1682.

DOI: https://doi.org/10.1093/mnras/stx286

PUBLIC RELEASE: 30-MAR-2017

URL: HTTP://WWW.RIT.EDU/NEWS/STORY.PHP?ID=60486

Astronomers identify purest, most massive brown dwarf

ABSTRACT: An international team of astronomers has identified a record breaking brown dwarf (a star too small for nuclear fusion) with the 'purest' composition and the highest mass yet known. The object, known as SDSS J0104+1535, is a member of the so-called halo -- the outermost reaches -- of our galaxy, made up of

the most ancient stars. The scientists report the discovery in Monthly Notices of the Royal Astronomical Society.

PUBLISHED: **"**Primeval very low-mass stars and brown dwarfs – II. The most metal-poor substellar object**",** Mon Not R Astron Soc (2017) 468 (1): 261-271.

DOI: https://doi.org/10.1093/mnras/stx350

PUBLIC RELEASE: 24-MAR-2017

URL:HTTP://WWW.RAS.ORG.UK/NEWS-AND-PRESS/2967-ASTRONOMERS-IDENTIFY-PUREST-MOST-MASSIVE-BROWN-DWARF

Fledgling stars try to prevent their neighbors from birthing planets

ABSTRACT: Stars don't have to be massive to evaporate material from around nearby stars and affect their ability to form planets, a new study suggests.

PUBLISHED: "First evidence of external disc photoevaporation in a low mass star forming region: the case of IM Lup", Mon Not R Astron Soc Lett (2017) 468 (1): L108-L112.

DOI: https://doi.org/10.1093/mnrasl/slx037

PUBLIC RELEASE: 22-MAR-2017

URL:http://www3.imperial.ac.uk/newsandeventspggrp/imperialcollege/newssummary/news_22-3-2017-14-23-44

Astronomers hazard a ride in a 'drifting carousel' to understand pulsating stars

ABSTRACT: What sounds like a stomach-turning ride at an amusement park might hold the key to unraveling the mysterious mechanism that causes beams of radio waves to shoot out from pulsars -- super-magnetic rotating stars in our galaxy.

PUBLISHED: "Low-frequency Observations of the Subpulse Drifter PSR J0034−0721 with the Murchison Widefield Array", The Astrophysical Journal, Volume 836, Number 2

DOI: https://doi.org/10.3847/1538-4357/aa5c35

PUBLIC RELEASE: 21-Mar-2017

URL: http://www.caastro.org/news/2017-drifter

Protostar blazes bright, reshaping its stellar nursery

ABSTRACT: New ALMA observations reveal that a massive protostar, deeply nestled in its dust-filled stellar nursery, recently roared to life, shining nearly 100 times brighter than before.

PUBLISHED: "An Extraordinary Outburst in the Massive Protostellar System NGC 6334I-MM1: Quadrupling of the Millimeter Continuum", The Astrophysical Journal Letters, Volume 837, Number 2, Published 2017 March 15

PUBLIC RELEASE: 15-Mar-2017

DOI: https://doi.org/10.3847/2041-8213/aa5d0e

URL: https://public.nrao.edu/news/2017-alma-protostar-outburst/

Researchers discover star in closest known orbit around black hole

ABSTRACT: An international team of astronomers has observed evidence of a star that whips around a black hole at a rate of nearly twice an hour. If confirmed, the finding could demonstrate the tightest orbital dance between a black hole and a companion star ever seen.

FUNDER: NASA

PUBLISHED: "The ultracompact nature of the black hole candidate X-ray binary 47 Tuc X9", Mon Not R Astron Soc (2017) 467 (2): 2199-2216.

DOI: https://doi.org/10.1093/mnras/stx166

PUBLIC RELEASE: 15-Mar-2017

URL:http://news.columbia.edu/content/Researchers-Discover-Star-in-Closest-Known-Orbit-around-Black-Hole

太阳物理

Paintings, sunspots and frost fairs: Rethinking the Little Ice Age

ABSTRACT: The whole concept of the 'Little Ice Age' is 'misleading,' as the changes were small-scale, seasonal and insignificant compared with present-day global warming, a group of solar and climate

scientists argue. The new work, led by Prof Mike Lockwood of the University of Reading, appears in a paper in Astronomy & Geophysics.

PUBLISHED: "Frost fairs, sunspots and the Little Ice Age", Astronomy & Geophysics, (2017) 58 (2): 2.17-2.23.

DOI: https://doi.org/10.1093/astrogeo/atx057

PUBLIC RELEASE: 4-APR-2017

太阳系和系外行星系统

AGU journal commentaries highlight importance of Earth and space science research

ABSTRACT: The American Geophysical Union (AGU) today published a collection of 27 essays as commentaries in its scientific journals highlighting the important role Earth and space science research plays in society.

PUBLIC RELEASE: 20-APR-2017

URL: http://agupubs.onlinelibrary.wiley.com/hub/issue/10.1002/(ISSN)2333-5084.SCISOC1/

Researchers produce detailed map of potential Mars rover landing site

ABSTRACT: Mineral deposits in a region on Mars called Northeast Syrtis Major suggest a plethora of once-habitable environments. By mapping those deposits in the region's larger geological context, the research could help set the stage for a possible rover mission.

PUBLISHED: "The geological history of Northeast Syrtis Major, Mars", icarus.2017.03.030

DOI: http://doi.org/10.1016/j.icarus.2017.03.030

PUBLIC RELEASE: 20-APR-2017

URL: https://news.brown.edu/articles/2017/04/syrtis

SwRI scientists discover evidence for a habitable region within Saturn's moon Enceladus

ABSTRACT: Scientists from Southwest Research Institute (SwRI) have discovered hydrogen gas in the plume of material spraying from Saturn's moon Enceladus. Analysis of data from NASA's Cassini spacecraft indicates that the hydrogen is best explained by chemical reactions between the moon's rocky core and warm water from its subsurface ocean. The SwRI-led team's discovery suggests that Enceladus' ocean floor could include features analogous to hydrothermal vents on Earth, which are known to support life on the seafloor.

PUBLISHED: "Cassini Finds Molecular Hydrogen in the Enceladus Plume: Evidence for Hydrothermal Processes", published in the April 14, 2017, issue of the journal Science.

DOI: 10.1126/science.aai8703

PUBLIC RELEASE: 13-APR-2017

URL: http://www.swri.org/9what/releases/2017/enceladus-saturn-moon-habitable.htm#.WPhZn5_BFec

Annotated photos highlight long-term international collaboration in atmospheric sciences

ABSTRACT: International cooperation is an essential prerequisite for long-term success in atmospheric sciences, an enterprise of global scale by its very nature. Annotated group photographs from two workshops, separated by no less than 95 years, underscore the human(e) dimension of scientific endeavours.

PUBLISHED: "Putting faces to names: Snapshots of two committee meetings, 95 years apart, emphasize continuous international cooperation in the atmospheric sciences", Advances in Atmospheric Sciences, May 2017, Volume 34, Issue 5, pp 571–575

DOI: 10.1007/s00376-017-6329-6

PUBLIC RELEASE: 12-APR-2017

URL: http://link.springer.com/article/10.1007/s00376-017-6329-6

ALMA investigates 'DeeDee,' a distant, dim member of our solar system

ABSTRACT: Using the Atacama Large Millimeter/submillimeter Array (ALMA), astronomers have revealed extraordinary details about a recently discovered far-flung member of our solar system, the planetary body 2014 UZ224, more informally known as DeeDee.

PUBLISHED: "Discovery and Physical Characterization of a Large Scattered Disk Object at 92 au", The Astrophysical Journal Letters, Volume 839, Number 1, 839:L15 (7pp), 2017 April 10

DOI: 10.3847/2041-8213/aa64d8

PUBLIC RELEASE: 12-APR-2017

'Cold' Great Spot discovered on Jupiter

ABSTRACT: Massive aurorae-generated weather system revealed by University of Leicester astronomers.

FUNDER: Science and Technology Facilities Council

PUBLISHED: "The Great Cold Spot in Jupiter's upper atmosphere", *Geophysical Research Letters*

DOI: 10.1002/2016GL071956

PUBLIC RELEASE: 11-APR-2017

URL: http://onlinelibrary.wiley.com/doi/10.1002/2016GL071956/abstract

NASA's MAVEN reveals Mars has metal in its atmosphere

ABSTRACT: Mars has electrically charged metal atoms (ions) high in its atmosphere, according to new results from NASA's MAVEN spacecraft. The metal ions can reveal previously invisible activity in the mysterious electrically charged upper atmosphere (ionosphere) of Mars.

FUNDER: NASA

PUBLISHED: "Unique, non-Earthlike, meteoritic ion behavior in upper atmosphere of Mars", Geophysical Research Letters

DOI: 10.1002/2017GL072635

PUBLIC RELEASE: 10-APR-2017

URL: https://www.nasa.gov/press-release/goddard/2017/metal-mars/

The Red Planet is severely gassed out

ABSTRACT: New measurements of Mars' thin atmosphere show that most of it has been lost to space due to bombardment from solar wind; this was the likely driver of the transition in Martian climate from an early, warm, wet environment to today's cold, dry, thin atmosphere.

PUBLISHED: " Mars' atmospheric history derived from upper-atmosphere measurements of 38Ar/36Ar", Science 31 Mar 2017:Vol. 355, Issue 6332, pp. 1408-1410

DOI: 10.1126/science.aai7721

PUBLIC RELEASE: 30-MAR-2017

Wrong-way asteroid plays 'chicken' with Jupiter

ABSTRACT: For at least a million years, an asteroid orbiting the 'wrong' way around the sun has been playing a cosmic game of chicken with giant Jupiter and with about 6,000 other asteroids sharing the giant planet's space, says a report published in the latest issue of Nature.

FUNDER: Natural Sciences and Engineering Research Council of Canada

PUBLISHED: "A retrograde co-orbital asteroid of Jupiter", Nature 543, 687–689 (30 March 2017)

DOI: 10.1038/nature22029

PUBLIC RELEASE: 29-MAR-2017

How a young-looking lunar volcano hides its true age

ABSTRACT: A young-looking volcanic caldera on the moon has been interpreted by some as evidence of relatively recent lunar volcanic activity, but new research suggests it's not so young after all.

PUBLISHED: "Ina pit crater on the Moon: Extrusion of waning-stage lava lake magmatic foam results in extremely young crater retention ages", Geology(2017),45(5):455

DOI: http://dx.doi.org/10.1130/G38594.1

PUBLIC RELEASE: 28-MAR-2017

URL: HTTPS://NEWS.BROWN.EDU/ARTICLES/2017/03/INA

Visualizing debris disk 'roller derby' to understand planetary system evolution

ABSTRACT: When planets first begin to form, the aftermath of the process leaves a ring of rocky and icy material that's rotating and colliding around the young central star like a celestial roller derby. Analogs to our own solar system's Kuiper Belt, these disks of debris left over from planet formation can be detected by astronomers and studied to help understand the processes that create planetary systems.

PUBLISHED: "HD 106906: A Case Study for External Perturbations of a Debris Disk", The Astrophysical Journal Letters, Volume 837, Number 1

DOI: https://doi.org/10.3847/2041-8213/aa61a7

PUBLIC RELEASE: 15-Mar-2017

URL: https://phys.org/news/2017-03-visualizing-debris-disk-roller-derby.amp

天文技术方法和仪器

Study unravels long-held Fermi puzzle tied to nonlinear systems

ABSTRACT: Nonlinear systems can indeed reach equilibrium, according to new research from an international team of physicists. The work has implications in materials science and other fields.

PUBLISHED: "Fluctuations in Hertz chains at equilibrium", Phys. Rev. E 95, 032903 – Published 6 March 2017

DOI: 10.1103/PhysRevE.95.032903

PUBLIC RELEASE: 14-APR-2017

URL: http://www.buffalo.edu/news/releases/2017/04/022.html

New study maps space dust in 3-D

ABSTRACT: A new Berkeley Lab-led study provides detailed 3-D views of space dust in the Milky Way, which could help us understand the properties of this dust and how it affects views of distant objects.

PUBLISHED: "Mapping the Extinction Curve in 3D: Structure on Kiloparsec Scales", The Astrophysical Journal, Volume 838, Number 1

DOI: https://doi.org/10.3847/1538-4357/aa619d

PUBLIC RELEASE: 22-MAR-2017

URL: https://newscenter.lbl.gov/2017/03/22/new-study-maps-space-dust-in-3-d/

Relativistic electrons uncovered with NASA's Van Allen Probes

ABSTRACT: Earth's radiation belts, two doughnut-shaped regions of charged particles encircling our planet, were discovered more than 50 years ago, but their behavior is still not completely understood. Now, new observations from NASA's Van Allen Probes mission show that the fastest, most energetic electrons in the inner radiation belt are not present as much of the time as previously thought.

FUNDER: NASA

PUBLISHED: "The hidden dynamics of relativistic electrons (0.7–1.5 MeV) in the inner zone and slot region", Journal of Geophysical Research

DOI: 10.1002/2016JA023719

PUBLIC RELEASE: 15-Mar-2017

URL:https://www.nasa.gov/feature/goddard/2017/relativistic-electrons-uncovered-with-nasa-s-van-allen-probes

文章推荐

Nature

Hydrogen halo lifts the veil of our galactic home

ABSTRACT: UA astronomers Huanian Zhang and Dennis Zaritsky have reported the first detections of diffuse hydrogen wafting about in a vast halo surrounding the Milky Way.

PUBLISHED: "The Galaxy's veil of excited hydrogen", Nature Astronomy 1, Article number: 0103 (2017)

DOI: 10.1038/s41550-017-0103

PUBLIC RELEASE: 18-APR-2017

RIT scientist measures brightness of the universe with NASA's New Horizons spacecraft

ABSTRACT: Images taken by NASA's New Horizons mission on its way to Pluto, and now the Kuiper Belt, have given scientists an unexpected tool for measuring the brightness of all the galaxies in the universe, said a Rochester Institute of Technology researcher in a paper published this week in Nature Communications.

PUBLISHED: "Measurement of the cosmic optical background using the long range reconnaissance imager on New Horizons", Nature Communications 8, Article number: 15003 (2017)

DOI: 10.1038/ncomms15003

PUBLIC RELEASE: 11-APR-2017

URL: http://www.rit.edu/news/story.php?id=60991

Long ago and far away, an average galaxy

ABSTRACT: Using a giant galaxy cluster as a cosmic-scale lens, astronomers have discovered a galaxy from the early universe that they think is 'typical' of its time. This could help astronomers better understand the Epoch of Reionization when the first galaxies appeared.

PUBLISHED: "Spectroscopic confirmation of an ultra-faint galaxy at the epoch of reionization", Nature Astronomy 1, Article number: 0091 (2017)

DOI: 10.1038/s41550-017-0091

PUBLIC RELEASE: 10-APR-2017

URl: https://www.nature.com/articles/s41550-017-0091

Explosive material: The making of a supernova

ABSTRACT: Pre-supernova stars may show signs of instability for months before the big explosion

PUBLISHED: "Confined dense circumstellar material surrounding a regular type II supernova**",** Nature Physics(2017)

DOI: 10.1038/nphys4025

PUBLIC RELEASE: 9-APR-2017

URL: http://wis-wander.weizmann.ac.il/space-physics/explosive-material-making-supernova

Waves on sun give NASA new insight into space weather forecasting

ABSTRACT: New research has uncovered a mechanism, similar to one that occurs on Earth, which may allow new insights into forecasting space weather and activity on the sun.

FUNDER: NASA

PUBLISHED: "The detection of Rossby-like waves on the Sun", Nature Astronomy 1, Article number: 0086 (2017)

DOI: 10.1038/s41550-017-0086

PUBLIC RELEASE: 30-MAR-2017

URL:https://www.nasa.gov/feature/goddard/2017/waves-on-sun-give-nasa-new-insight-into-space-weather-forecasting

Igniting a solar flare in the corona with lower-atmosphere kindling

ABSTRACT: Recent images captured by NJIT's 1.6-meter New Solar Telescope at Big Bear Solar Observatory (BBSO) have revealed the emergence of small-scale magnetic fields in the lower reaches of the corona the researchers say may be linked to the onset of a main flare.

FUNDER: National Science Foundation, NASA

PUBLISHED: "High-resolution observations of flare precursors in the low solar atmosphere", Nature Astronomy 1, Article number: 0085 (2017)

DOI: 10.1038/s41550-017-0085

PUBLIC RELEASE: 28-MAR-2017

URL:HTTP://NEWS.NJIT.EDU//TRIGGERING-SOLAR-FLARE/?UTM_SOURCE=NJIT&UTM_MEDIUM=HOME&UTM_CONTENT=NEWS&UTM_CAMPAIGN=TEASER

Dark matter less influential in galaxies in early universe

ABSTRACT: New observations indicate that massive, star-forming galaxies during the peak epoch of galaxy formation, 10 billion years ago, were dominated by baryonic or 'normal' matter. This is in stark contrast to present-day galaxies, where the effects of mysterious dark matter seem to be much greater. This surprising result was obtained using ESO's Very Large Telescope and suggests that dark matter was less influential in the early universe than it is today.

PUBLISHED: "Strongly baryon-dominated disk galaxies at the peak of galaxy formation ten billion years ago" ,Nature,Volume:543, Pages:397–401Date published:(16 March 2017)

DOI: 10.1038/nature21685

PUBLIC RELEASE: 15-Mar-2017

URL: http://www.eso.org/public/news/eso1709/

When helium behaves like a black hole

ABSTRACT: A team of scientists has discovered that a law controlling the bizarre behavior of black holes out in space -- is also true for cold helium atoms that can be studied in laboratories. This finding may be a step toward a long-sought quantum theory of gravity and new advances in quantum computing.

FUNDER: National Science Foundation

PUBLISED: "Entanglement area law in superfluid 4He", Nature Physics,Year published:(2017)

DOI: 10.1038/nphys4075

PUBLIC RELEASE: 21-Mar-2017

URL: http://www.uvm.edu/~uvmpr/?Page=news&storyID=24229

Science

Rare brightening of a supernova's light found by Caltech's Palomar Observatory

ABSTRACT: An international team of astronomers has, for the first time, seen a cosmic magnification of the light from a class of supernova called Type Ia.

PUBLISHED: "iPTF16geu: A multiply imaged, gravitationally lensed type Ia supernova", Science 21 Apr 2017:Vol. 356, Issue 6335, pp. 291-295

DOI: 10.1126/science.aal2729

PUBLIC RELEASE: 20-APR-2017

URL: HTTPS://WWW.EUREKALERT.ORG/PUB_RELEASES/2017-04/CIOT-RBO041817.PHP

In a quantum race everyone is both a winner and a loser

ABSTRACT: Our understanding of the world is mostly built on basic perceptions, such as that events follow each other in a well-defined order. Such definite orders are required in the macroscopic world, for which the laws of classical physics apply. The current work by a team of physicists from the University of Vienna is the first experimental quantification of such a superposition. It will be published in an upcoming issue of Science Advances.

FUNDER: http://dx.doi.org/10.1126/sciadv.1602589

PUBLISHED: "Experimental verification of an indefinite causal order", Science Advances 24 Mar 2017: Vol. 3, no. 3, e1602589

DOI: 10.1126/sciadv.1602589

PUBLIC RELEASE: 24-MAR-2017

Astronomers observe early stages of Milky Way-like galaxies in distant universe

ABSTRACT: For decades, astronomers have found distant galaxies by detecting the characteristic way their gas absorbs light from a bright quasar in the background. But efforts to observe the light emitted by these same galaxies have mostly been unsuccessful. Now, a team of astronomers using the Atacama Large Millimeter Array (ALMA) in Chile has observed emissions from two distant galaxies initially detected by their quasar absorption signatures, and the results were not what they had expected.

FUNDER: National Science Foundation

PUBLISHED: "[C II] 158-μm emission from the host galaxies of damped Lyman-alpha systems", Science 24 Mar 2017:Vol. 355, Issue 6331, pp. 1285-1288

DOI: 10.1126/science.aal1737

PUBLIC RELEASE: 23-MAR-2017

URL: https://phys.org/news/2017-03-astronomers-early-stages-milky-way-like.html

Fledgling stars try to prevent their neighbors from birthing planets

ABSTRACT: Extraordinary decontamination efforts are underway in areas affected by the 2011 nuclear accidents in Japan. The creation of total radioactivity maps is essential for thorough cleanup, but the most common methods do not 'see' enough ground-level radiation.

FUNDER: Japan Society for the Promotion of Science, Japan Science and Technology Agency

PUBLISHED: " First On-Site True Gamma-Ray Imaging-Spectroscopy of Contamination near Fukushima Plant", Scientific Reports 7, Article number: 41972,2017

DOI: 10.1038/srep41972

PUBLIC RELEASE: 22-MAR-2017

Before and after: Unique changes spotted on comet 67p/Churyumov-Gerasimenko

ABSTRACT: A study published March 21, 2017 in the journal Science summarizes the types of surface changes observed during the two years that the European Space Agency's Rosetta spacecraft spent investigating comet 67P/Churyumov-Gerasimenko. Notable differences are seen before and after the comet's most active period --perihelion -- when it reached its closest point to the Sun along its orbit.

FUNDER: European Space Agency, NASA, Göttingen Academy of Sciences

PUBLISHED: " Surface changes on comet 67P/Churyumov-Gerasimenko suggest a more active past", Science 31 Mar 2017:Vol. 355, Issue 6332, pp. 1392-1395

DOI: 10.1126/science.aak9384

PUBLIC RELEASE: 21-Mar-2017

URL: http://science.sciencemag.org/content/355/6332/1392

Comet 67P is constantly undergoing a facelift

ABSTRACT: Changes that the Rosetta spacecraft discovered on the surface of Comet 67P/Churyumov-Gerasimenko, including the collapse of entire cliffs, were likely driven by seasonal events, according to a new study.

PUBLISHED: " Surface changes on comet 67P/Churyumov-Gerasimenko suggest a more active past", Science 31 Mar 2017:Vol. 355, Issue 6332, pp. 1392-1395

DOI: 10.1126/science.aak9384

PUBLIC RELEASE: 21-MAR-2017

URL: https://www.sciencedaily.com/releases/2017/03/170321122529.htm

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）