

## › The Who / What / Why of CAASTRO

» ARC Centre of Excellence for All-sky Astrophysics (2011-2018)

» 79 members at six Australian nodes

» 17 national & international partners

» high-profile Chief Investigators

» interlinked research themes:

*The Evolving Universe* (galaxy formation; led by Prof Stuart Wyithe)

*The Dark Universe* (unknown matter & forces; led by Prof Brian Schmidt)

*The Dynamic Universe* (transient sources; led by Prof Matthew Bailes)

UK  
France  
Germany



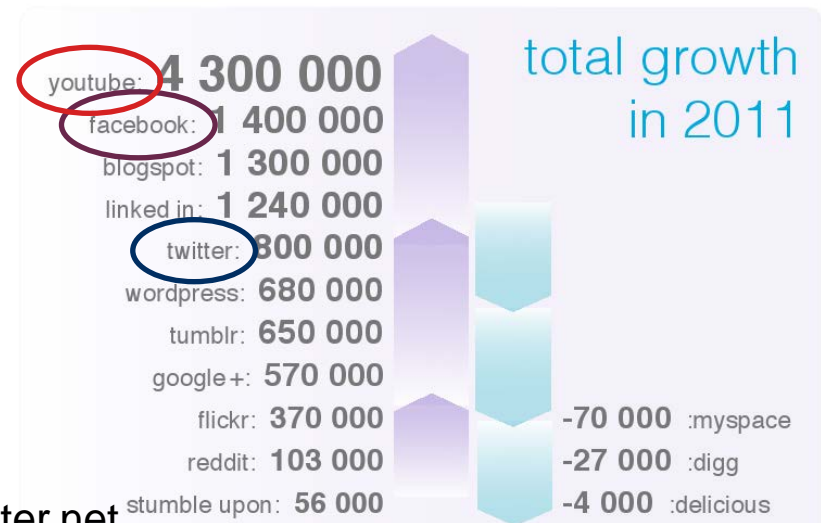
Canada  
US  
India



- › **“Astronomy is physics on steroids” (→ hands-on outreach)**
  - » public awareness & school engagement activities at node locations
  - » making scientists approachable & creating positive role models
- › **“Getting science where it’s needed” (→ hands-off outreach)**
  - » leveraging via Social Media
  - » reaching out to the (yet) ‘uninitiated’

[twitter.com/caastro\\_arc](https://twitter.com/caastro_arc)  
[facebook.com/caastro.arc](https://facebook.com/caastro.arc)  
[youtube.com/astrocentre](https://youtube.com/astrocentre)

## 2011 Social Media Growth Statistics in Australia



Source: [digitalglitter.net](http://digitalglitter.net)



**CAASTRO**  
ARC CENTRE OF EXCELLENCE  
FOR ALL-SKY ASTROPHYSICS

# The Diamond Planet



YouTube CAASTRO - All-sky Astrophysics 19 subscribers 3,703 video views

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Flying the Oktokopter for Radio Ast... 102 views 2 months ago	Brian Schmidt leads "The Dark Uni... 48 views 4 months ago	Career Advice from Brian Schmidt... 201 views 4 months ago
The 4-dimensional Universe explai... 195 views 4 months ago	Brian Schmidt's journey from Com... 36 views 4 months ago	Nobel Prize winner Brian Schmidt... 340 views 4 months ago
CAASTRO's Dr Cath Trott is detecti... 48 views 4 months ago	Education, Public Outreach, and Tr... 120 views 4 months ago	CAASTRO in the Classroom: Speci... 104 views 4 months ago
CAASTRO - new Centre for All-sky ... 63 views 6 months ago	CAASTRO Launch - Aboriginal 'We... 57 views 6 months ago	Bryan Gaensler presenta CAASTR... 35 views 6 months ago

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CAASTRO Outreach stuff  
Learn more about our school & community engagement programs! 5 videos

Personal CAASTRO stuff  
Learn more about our staff and students! 6 videos

Technical astro stuff  
Learn more about our telescope and supercomputing facilities! 6 videos

Scientific astro stuff  
Learn more about our research projects! 4 videos

Informative CAASTRO stuff  
Learn more about the All-sky Astrophysics approach! 6 videos

Educational astro stuff  
Learn more about Astronomy & Astrophysics! 3 videos

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## › Video Influx

- ›› profile interviews with Director, Research Themes Leaders, Partners

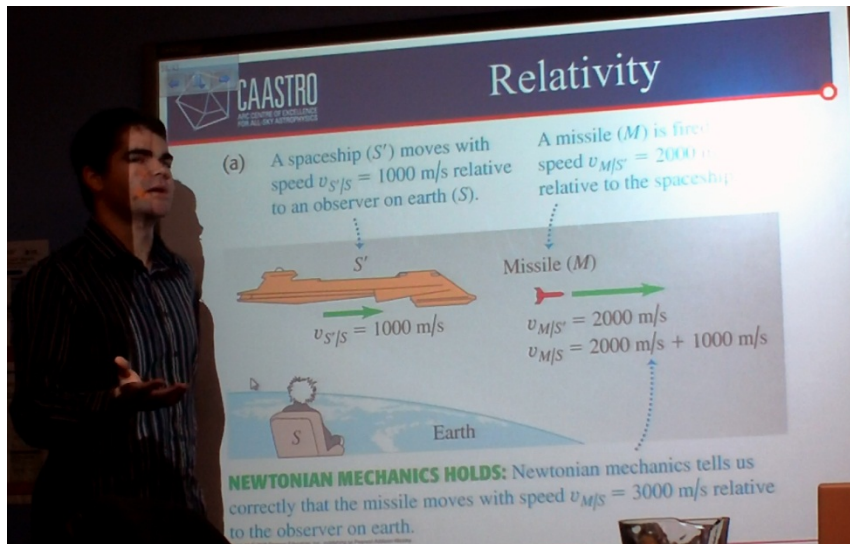


Prof s Stuart Wyithe, Brian Schmidt, Bryan Gaensler



## › Video Influx

- ›› profile interviews with Director, Research Themes Leaders, Partners
- ›› recordings of seminar & public lectures
- ›› facilities, simulations, fieldwork etc.



“CAASTRO in the Classroom”



Oktokopter & Radio Astronomy

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- › video press releases

**26 August 2011:**  
Bailes et al.  
“Transformation of a Star  
into a Planet in a  
Millisecond Pulsar Binary”  
*Science*

Transformation of a Star into a Planet in a Millisecond  
Pulsar Binary.

M. Bailes<sup>1,2,3\*</sup>, S. D. Bates<sup>4</sup>, V. Bhlerao<sup>5</sup>, N. D. R. Bhat<sup>1,3</sup>,  
M. Burgay<sup>6</sup>, S. Burke-Spolaor<sup>7</sup>, N. D’Amico<sup>6,9</sup>, S. Johnston<sup>7</sup>,  
M. J. Keith<sup>7</sup>, M. Kramer<sup>8,4</sup>, S. R. Kulkarni<sup>5</sup>, L. Levin<sup>1,7</sup>, A. G. Lyne<sup>4</sup>,  
S. Milia<sup>9,6</sup>, A. Possenti<sup>6</sup>, L. Spitler<sup>1</sup>, B. Stappers<sup>4</sup>, W. van Straten<sup>1,3</sup>

<sup>1</sup>Centre for Astrophysics and Supercomputing,  
Swinburne University of Technology, PO Box 218 Hawthorn, VIC 3122, Australia.

<sup>2</sup>Department of Astronomy, University of California, Berkeley, CA, 94720, USA.

<sup>3</sup>ARC Centre for All-Sky Astronomy (CAASTRO).

<sup>4</sup>Jodrell Bank Centre for Astrophysics, School of Physics and Astronomy,  
The University of Manchester, Manchester M13 9PL, UK.

<sup>5</sup>Caltech Optical Observatories, California Institute of Technology,  
MS 249-17, Pasadena, CA 91125, USA.

<sup>6</sup>INAF - Osservatorio Astronomico di Cagliari,  
Poggio dei Pini, 09012 Capoterra, Italy.

<sup>7</sup>Australia Telescope National Facility, CSIRO Astronomy and Space Science,  
P.O. Box 76, Epping NSW 1710, Australia.

<sup>8</sup>MPI fuer Radioastronomie, Auf dem Huegel 69,  
53121 Bonn, Germany.

<sup>9</sup>Dipartimento di Fisica, Università degli Studi di Cagliari,  
Cittadella Universitaria, 09042 Monserrato (CA), Italy.

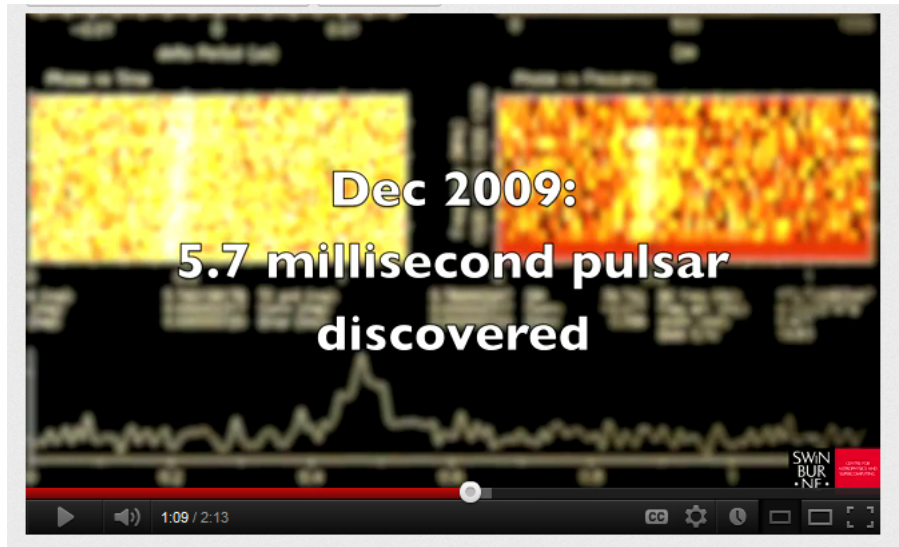
\* To whom correspondence should be addressed; Email: mbailes@swin.edu.au



## › Video Influx

- › profile interviews with Director, Research Themes Leaders, Partners
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Millisecond Pulsar Binary”  
*Science*





## › A Planet made of Diamond

›› coordinated joint press release & 'local' versions of 9 research institutes

›› media summary report 26-31 August 2011:

*12x Australian Print, 8x International Print*

*22x Australian Broadcast, 1x International Broadcast*

*113x Australian Online, 221x International Online*

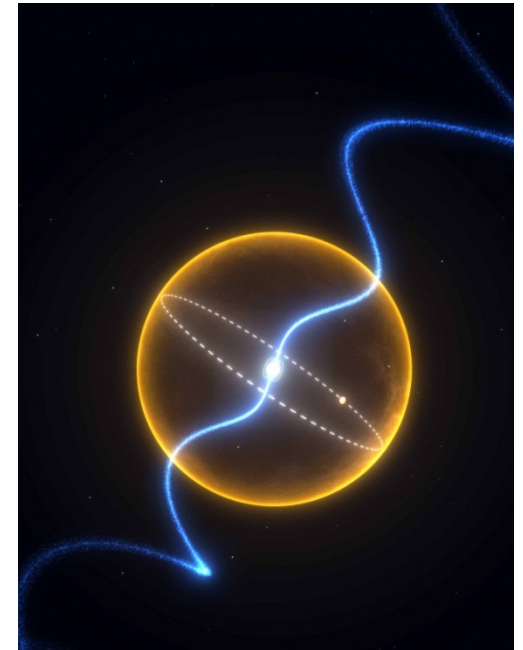
›› frequent alternative headlines:

*The Big Bling Theory*

*Planet is a Girl's best Friend*

*Pulsar in the Sky, with Diamonds*

*It's a Bird! It's a Planet! It's a gigantic Diamond!*







› “With great power comes great responsibility”

›› penetration of public space

The screenshot shows a Google search interface with the search term "diamond planet youtube". The search results are filtered by "Everything" and show several YouTube video thumbnails with titles and descriptions. The results include:

- Massive Diamond Planet Orbits Neutron Star ... - YouTube**  
www.youtube.com/watch?v=yIGwsllyZf0  
25 Aug 2011 - 2 min - Uploaded by VideoFromSpace  
Using the giant Parkes Radio Telescope in New South Wales, Australia, astrophysicists have found an ...
- Astronomers Discover Diamond Planet - YouTube**  
www.youtube.com/watch?v=g1IRUxuo0IA  
26 Aug 2011 - 2 min - Uploaded by NewsyScience  
Transcript by http://www.newsy.com BY STEVEN SPARKMAN  
You're watching multisource science video ...
- Giant Planet Sized Diamond Found Floating in Space - YouTube**  
www.youtube.com/watch?v=Zm0sVY10V0  
9 Mar 2010 - 4 min - Uploaded by mitchellgibsonmd8000  
The largest **diamond** ever found is not on Earth, but faraway across the galaxy. It's the burned out corpse of ...
- Pulsar with a Diamond Planet [1080p] - YouTube**  
www.youtube.com/watch?v=efz-8WGI1UU  
25 Aug 2011 - 2 min - Uploaded by dxatlanta  
Astronomers have discovered the densest extrasolar **planet** yet: A Jupiter-mass remnant of a carbon- and ...
- Illuminati discover the diamond planet - YouTube**  
www.youtube.com/watch?v=0m6R60PNkis  
25 Aug 2011 - 3 min - Uploaded by NOLINKNEWS  
Astronomers Discover **Diamond Planet**by NewsyScience7585 views. Loading more suggestions... Load more ...
- Scientists Discover Diamond Planet - YouTube**  
www.youtube.com/watch?v=RRJIM\_ZgByo  
27 Aug 2011 - 2 min - Uploaded by jhazEMO  
(Reuters) - Astronomers have spotted an exotic **planet** that seems to be made of **diamond** racing around a ...
- The Diamond Planet - YouTube**  
www.youtube.com/watch?v=Ir5vfmXe2pA  
17 Oct 2011 - 1 min - Uploaded by applepie918  
This is about the **Diamond Planet** and it will talk much about it.
- Diamond Planet has been discovered - the most dense ... - YouTube**  
www.youtube.com/watch?v=9AzNxfGdJY  
26 Aug 2011 - 1 min - Uploaded by NerdWireTV  
Read along: Astronomers have discovered a new **planet**, that could probably be described as one of the most ...



› “With great power comes great responsibility”

» penetration of public space



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## PSR J1719-1438

From Wikipedia, the free encyclopedia

**PSR J1719-1438** is a **millisecond pulsar** with a spin period of 5.7 ms located about 4000 ly from Earth in the direction of *Serpens* Cauda,<sup>[1][2]</sup> approximately one **minute** from the border with Ophiuchus. Millisecond pulsars are generally thought to begin as normal pulsars and then spin up by accreting matter from a **binary** companion.

### Diamond planet [edit]

*Main article: PSR J1719-1438 b*

PSR J1719-1438 was discovered in 2011 by the High Time Resolution Survey, a **radio astronomy** search for astronomical objects which rapidly vary in radio brightness, such as pulsars.<sup>[1]</sup> Timing measurements using the *Parke*s Telescope and *Lovell Telescope* showed that it has a low-mass companion: **PSR J1719-1438 b**.<sup>[1]</sup> The companion has a mass similar to that of *Jupiter*, but at about 40% of the diameter. It orbits the pulsar with a period of 2.17 hours at a distance of around 600,000 km (0.89 **solar radii**).<sup>[1]</sup> The companion is likely the remnant of a star whose outer layers were siphoned off by the more massive pulsar. Calculations show the companion has a minimum density of 23 **grams per cubic centimeter** and is probably an ultra-low mass carbon-oxygen **white dwarf**.<sup>[1]</sup>

Because the companion to PSR J1719-1438 is planet sized, made primarily of carbon (with an unknown amount of oxygen), and is very dense, it may be similar to a very large diamond. In the science press, the object has been called the "Diamond Planet"<sup>[2][3][4]</sup>.

### See also [edit]

- *EF Eridani*, a star system with a compact star and a degraded planetary-mass former star

### References [edit]

- ↑ ***abcdefghijklmnopqrstuvwxyz*** Bailes, M.; Bates, S. D.; Bhalaria, V.; Bhat, N. D. R.; Burgay, M.; Burke-Spolaor, S.; d'Amico, N.; Johnston, S. et al. (2011). "Transformation of a Star into a Planet in a Millisecond Pulsar Binary". *Science*. Bibcode 2011Sci...333.1717B. doi:10.1126/science.1208890.
- ↑ <sup>***a b***</sup> "Star Transforms Into A Diamond Planet". *Universe Today*. Retrieved 8/26/2011.
- ↑ "Surprise! Alien Planet Made of Diamond Discovered". *Space.com*. Retrieved 8/25/2011.
- ↑ "A Planet made of Diamond". *Max Planck Institut for Radio Astronomy*. Retrieved 8/26/2011.

PSR J1719-1438	
<b>Observation data</b>	
Epoch	MJD 55411.0 <sup>[1]</sup> Equinox J2000
Constellation	Serpens
Right ascension	17:19:10.0730(1) <sup>[1]</sup>
Declination	−14:38:00.96(2) <sup>[1]</sup>
<b>Characteristics</b>	
Spectral type	millisecond pulsar <sup>[1]</sup>
Apparent magnitude (R)	>25.4 <sup>[1]</sup>
Apparent magnitude (g)	>24.1 <sup>[1]</sup>
Apparent magnitude (i)	>22.5 <sup>[1]</sup>
<b>Astrometry</b>	
Distance	~1,200 <sup>[1]</sup> pc
<b>Orbit</b> <sup>[1]</sup>	
Primary	PSR J1719-1438
Companion	PSR J1719-1438b
Period (P)	0.090706293(2) days
Semimajor axis (a)	$a_p \sin i = 0.001819(1)$ light seconds
Eccentricity (e)	<0.06
Periastron epoch (T)	MJD 55411.0
<b>Details</b>	
<b>Other designations</b>	
<b>Database references</b>	

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★ ★ ★ ★ ★

I am highly knowledgeable about this topic (optional)



› “With great power comes great responsibility”

›› penetration of public space

The screenshot shows the Facebook interface for a community page titled "Pulsar J1719-1438 Diamond Planet Bee-Vee". The page features a profile picture of a glowing sphere with blue and yellow energy lines. The left sidebar includes navigation options for Wall, Info, Photos, and About. The main content area shows a "Like" button, a "Wall" section with a "Write something..." text box, and a "RECENT ACTIVITY" section with two entries: "Pulsar J1719-1438 Diamond Planet Bee-Vee joined Facebook" and "Pulsar J1719-1438 Diamond Planet Bee-Vee changed their About". The page footer contains copyright information and navigation links.

facebook

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Keep me logged in

[Sign Up](#) Facebook helps you connect and share with the people in your life.

**Pulsar J1719-1438 Diamond Planet Bee-Vee**

[Like](#)

Community

**Wall** Pulsar J1719-1438 Diamond... · [Everyone \(Top posts\)](#)

Share: [Post](#) [Photo](#)

Write something...

RECENT ACTIVITY

- Pulsar J1719-1438 Diamond Planet Bee-Vee joined Facebook. · [Like](#) · [Comment](#)
- Pulsar J1719-1438 Diamond Planet Bee-Vee changed their [About](#).

There are no more posts to show.

3 like this

1 talking about this

[Create a Page](#)

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› “With great power comes great responsibility”

›› penetration of public space

The screenshot shows a Newgrounds audio player interface. At the top left is the Newgrounds logo with the tagline "EVERYTHING, BY EVERYONE." Below the logo is a navigation menu with tabs for Games, Movies, Audio, Art, Channels, Community, and Shop NG. The main content area is split into two columns. The left column features a game advertisement for "JUST TRY AND SURVIVE... TOP 4 TEAM BATTLE" with a "PLAY NOW" button and "FREE TO PLAY" text. Below the ad is a "RATE THIS SUBMISSION!" section with five star icons and a "Credits" section for the author "RetromanOMG". The right column displays the audio player for "PSR J1719-1438 B" with a "Download this song!" button. The player shows a progress bar at 00:16 / 07:14 and a star rating of four stars. Below the player is an "Author Comments" section with two paragraphs of text and a "Reviews" section at the bottom.

**NEWGROUNDS**  
EVERYTHING, BY EVERYONE.

Games Movies Audio Art Channels Community Shop NG

PLAY NOW  
FREE TO PLAY

JUST TRY AND SURVIVE...  
TOP 4 TEAM BATTLE  
Play on KONGREGATE

RATE THIS SUBMISSION!  
VOTE FAIRLY! HATER VOTES AND ASS-KISSERS DON'T HELP ANYBODY.

Credits  
Author: RetromanOMG

CC Licensing Terms

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- Noncommercial:** You may not use this work for commercial purposes unless you make specific arrangements with the artist.
- Share Alike:** If you alter, transform, or build upon this image, you may distribute the resulting creation only under a license identical to this one.

Commons Deed | Legal Code

PSR J1719-1438 B  
Download this song!

Techno  
161 Plays | 15 Downloads  
★★★★☆

Author Comments

I've been working on this for the past two months since The Black Hole. It's a step in a different direction for me, I feel. Instead of throwing as many orchestral soundfonts as I could into a song, I instead focused on making synths for it.

I feel I should warn you; I gave in to peer pressure and added a Dubstep section in the middle. I'm not very good at Dubstep, and would really like some thoughts on how it went.

Anyway, "PSR J1719-1438 b," the name of this song, is taken from a recently discovered star I've been reading about. It's carbon core has been compressed into pure diamond, and I found that fascinating enough to name a song about it. Unfortunately, that'll make it impossible to search for on the site, so I've added "PSR" as a tag.

Reviews





# The Diamond Planet

- › **“With great power comes great responsibility”**
  - › penetration of public space
  - › risk of diluting the scientific message



26 August 2011, 4.08am AEST

**Diamond planet found (if you like it then you should have put a ring on it)**



Stars shine, for sure, but PSR J1719-1438 is sporting some serious bling. Robyn Beck/AFP

A planet has been found in our Milky Way galaxy that may be made entirely of diamond.

As reported in *Science Today*, an international astronomy team led by Swinburne University's Matthew Bailes, has discovered a low-mass but dense object in orbit around a rapidly-rotating neutron star.

This binary system (the name given to any two objects in space orbiting a common center of mass) exists some 4,000 light-years away in the constellation of Serpens (the Snake).



## › Significance of the Discovery

» for science: “fills a gap in the binary pulsar family” [Prof Matthew Bailes]

PSR J1719–1438 demonstrates that special circumstances can conspire during binary pulsar evolution that allows neutron star stellar companions to be transformed into exotic planets unlike those likely to be found anywhere else in the Universe. The chemical composition, pressure and dimensions of the companion make it certain to be crystallized (ie diamond).

» for the public: “Now we just have to figure out how to get a team over there and collect some diamond.” [www.geekosystem.com]

**So...** quality, beauty & honesty?



crystalline carbon = diamond  
[Goddard Space Flight Center]

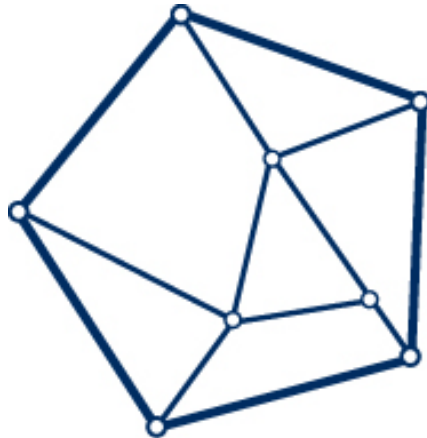


enhanced visual appeal &  
discoverability of science trivia



**CAASTRO**  
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FOR ALL-SKY ASTROPHYSICS

# The Diamond Planet



**Watch this Space!**