

RASC victoria council

this month

monday nights

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Ed Maxfield, Blaire Pellatt, Colin Scarfe,
Chris Gainor, Norm Willey

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Astronomy Cafe

Fairfield Community Centre,
1330 Fairfield, Victoria
7:30-11pm

Call John at 250.480.0928 for
directions and information.
New comers are especially
welcome. Come and enjoy!

**ASTRONOMY
CAFÉ**



second wednesday of the month

Monthly Meeting

7:30 PM, Elliott Lecture Theatre,
Rm 060, UVic.

as sky and interest dictate

New Observers Group

Hosted by Sid Sidhu.
1642 Davies Road, Highlands.
Call 391-0540 for information
and directions.

by email

**Observer/CU Volunteers/
Members email lists**

Contact Joe Carr to subscribe to
these email lists for important,
timely, member-related news.

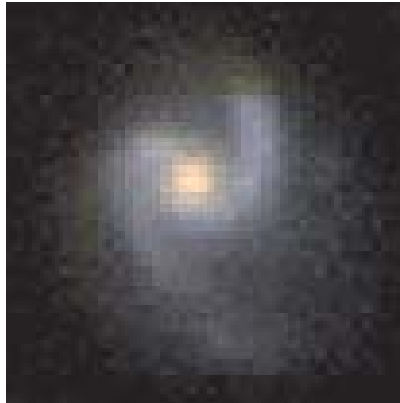
skynews



*this month***Dr. Chris Pritchett****Supernovae and the Mystery of “Dark Energy”****February 14th, 7:30 PM, Elliott Lecture Theatre, Rm 060, UVic**

The Universe is filled with a mysterious energy that causes its expansion to accelerate. The nature of this “dark energy” (not to be confused with dark matter) is completely unknown, and represents perhaps the greatest challenge to face physics and astronomy in the past century. Canada and France are together leading the world in the observational quest to understand this dark energy, through the Supernovae Legacy Survey. Using observations of faint, very distant supernovae (lookback times of more than half of the age of the Universe), we can probe the geometry of the Universe, and detect the signature of dark energy with a precision that has never before been attained. In this talk, I will focus on the detector and telescopes that make this project possible, the observations, and a simple picture of how our observations constrain dark energy.

Dr. Pritchett’s first memory of interest in astronomy and physics was 1963 solar eclipse visible in the prairies. One thing led to another, and he received a small telescope for his birthday. The first thing he looked at with it was the Pleiades, which he confused with Orion (the shape is similar at least!). His interests shifted more to music as a teenager, but he rediscovered astronomy during a physics undergrad degree at U Sask. This was mostly due to working summers at HIA (then DAO) for Graham Hill and K.O. Wright.

*contact us on-line***Web Site**www.victoria.rasc.ca**New Members**newmembers@victoria.rasc.ca**General Inquiries**info@victoria.rasc.ca

bring a huge shock. “Baryonic structures are expected to form only inside the dark-matter scaffold,” he says. “There will need to be a lot of follow-up work before we really believe any individual discrepancies.”

A light pull

Massey used a technique called gravitational lensing, whereby the pull from dark matter caught in between a star and the observing telescope alters the path of the light, and allows the presence of dark matter to be inferred.

Eric Linder of the University of California, Berkeley, who was not involved with the work, agrees that the map backs up the favoured theory that dark matter forms a scaffold on which galaxies form.

He suggests possibilities for the more unusual spots in the map: one is that galaxies made of dark matter (dark galaxies) exist, but he thinks this is unlikely. Another possibility is that the discrepancies are errors in the data — which seem almost inevitable given that mapping the dark matter required a very sensitive measurement of an incredibly small signal. “Right now the discrepancies are curiosities rather than items of concern,” Linder says.

Massey is also confident in the robustness of his map on the whole. “A couple of individual discrepancies in the map are not a huge surprise,” he says. “The technique is intrinsically more noisy, and more prone to systematic errors, near the edges of the map.” That is where most of the discrepancies are seen.

Blown away

There are plausible explanations for small areas of dark matter and visible matter existing in isolation.

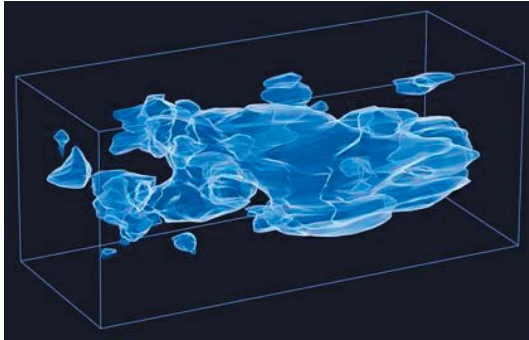
Dark matter, if the clump is small enough, could have any accumulating visible matter blown out of it by a high-energy phenomenon such as a quasar or a supernova, for example. The collision of two galaxies could also blow an amount of visible matter out as a faint satellite galaxy that has no associated dark matter, suggests Frenk. But these theories can’t explain the large features visible on the COSMOS map, he adds.

Like Massey and Linder, Frenk also suspects that the discrepancies are due to errors: “We know too much about the Universe,” he says, to have completely missed this phenomenon up till now.

Dark Matter Mapped by Katherine Sanderson

Hot on the heels of evidence last year that dark matter really does exist, the same technique has been used to map this uncharacterized mass across half a million distant galaxies.

The map shows that, as predicted, the mysterious dark matter that makes up a quarter of the Universe forms a filamentous 'skeleton' upon which visible matter congregates, eventually producing stars. This is the first time such a large-scale three-dimensional picture of dark matter has been produced, and it will allow cosmologists to probe deeper into the nature of this elusive matter.



This illustration shows the three-dimensional distribution of dark matter in a patch of the universe, going back from a nearby region in recent time (on the left) to a distant region about 6.5 billion years ago (on the right). The chart indicates that the distribution of mass has become increasingly clumpy.

But the map, published in *Nature*¹, also has a few puzzles within it. Some areas show clumps of dark matter that aren't accompanied by the bright features associated with conventional, visible material (made of baryonic matter), and vice versa.

"On the large scale the general picture is as expected, but there are some small-scale

discrepancies," says Richard Massey at the California Institute of Technology, Pasadena, and one of the team members who pieced together the map from hundreds of slightly overlapping images from the Hubble Space Telescope's Cosmic Evolution Survey (COSMOS).

The existence of large clumps of isolated dark matter and visible matter flies in the face of everything we know, says cosmologist Carlos Frenk of the University of Durham, UK.

The discrepancies could be a simple error resulting from the way the observations were made. But if they are real, says Massey, they will

on the cover

George Ball Honorary President, Victoria Centre, RASC

It is with great sadness we announce the death of George Ball on Friday, January 19, 2007. Honorary President of Victoria Centre, George was a member of RASC since 1955, and was a Life Member. He is part of our history, so this is the end of an era here for the Victoria Centre.

Condolences for George can be read at: http://victoria.rasc.ca/articles/2007/george_ball_condolences.htm

coming up

John McDonald, 2nd VP, Victoria Centre - RASC

Subject: TBA

March 14, 7:30 PM, Elliott Lecture Theatre, Rm 060, UVic

Dr. Julio Navarro, UVic, Department of Astronomy

Subject: TBA

April 11, 7:30 PM, Elliott Lecture Theatre, Rm 060, UVic

Dr. Navarro's research interests are centered on the formation and evolution of galaxy systems within the overall cosmological context.

Russ Robb, UVic, Department of Astronomy

Subject: TBA

May 9, 7:30 PM, Elliott Lecture Theatre, Rm 060, UVic

Extrasolar planets, high precision photometry, variable stars and robotic telescopes are Russ's primary research interests.

President's Report

**President's Message
February, 2007**

We have made some progress finding members to do some of the jobs in the Job Jar. Charles Banville agreed to run the Lending Library for periodicals, books and audio-visual materials. Thanks Charles, and welcome to Victoria Centre's Council. Bill Almond agreed to take on the Membership Coordinator role. Bill is already a Member-at-Large and our Centre's Historian, so he is contributing lots of time to the cause already. Why don't you volunteer to take one of the remaining jobs?



- Make coffee after the monthly meetings
- RASCALs Star Party Coordinator

Our Honourary President George Ball died on January 19th. The tributes are many to this man who gave so much to astronomy, and Victoria Centre in particular. George illustrated just how much difference one person can make when they are dedicated and selfless. His memorial service had good representation from Victoria Centre member, and Sid Sidhu spoke on behalf of us all. We will have a short memorial for George at our Feb 14th meeting.

I have some exciting news to report about Observatory Hill. Over the last year, our members have observed from the Hill under a License to Use Land Agreement we signed with the National Research Council in October 2005. Your Vice Presidents and myself recently held a meeting with National Research Council representatives Jacqueline Porter (Manager of the Centre of the Universe), Jim Hesser (Director of the Dominion Astrophysical Observatory), and Kevin Farris (Coordinator, Administration and Communications). At that meeting, we agreed to put a two year agreement in place which will be based on the existing Agreement. NRC also very generously offered to build a roll-off roof observatory for our exclusive use at the old 16" site! This presents some exciting possibilities for our members, and it will certainly enhance our use of the Hill in future,



Charles Banville, M45
 11 January from the DAO, lower lot.
 Optics: TeleVue NP-101, f/5.4 on Losmandy G-11. Camera: Canon 20Da
 Exposures: 75 at 60 sec @ ISO 800.
 Processing: ImagesPlus- Dark, flat, and bias calibration. Files combined using MinMax Excluded.
 Digital Development: Photoshop-Screen Applied. Color balance. Neat Image- Noise reduction.

John McDonald - M81, M82
 Equipment: Williams 105mm with 0.8x focal reducer and Canon 30D camera on HEQ5 mount.
 Exposures: 78 60 sec. light, 17 Dark and 10 flat frames.
 Processing: ImagesPlus and Photoshop



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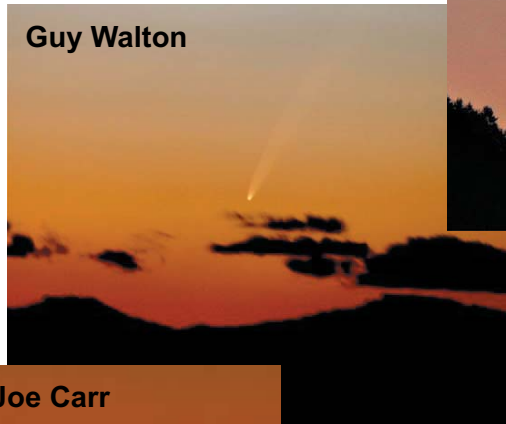
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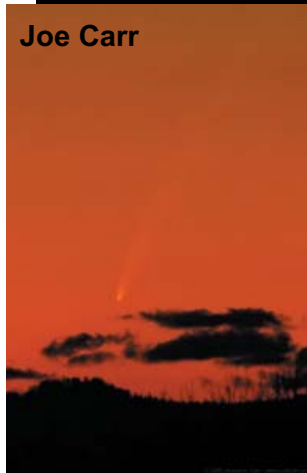
Jim Cliffe



Bill Weir



Guy Walton



Joe Carr



John McDonald

irrespective of what equipment we decide will be housed in our new observatory.

A few months ago Victoria Centre applied to the BC Gaming Commission for funds to purchase a new 16" goto telescope. The proposal states that this scope will be used to offer public outreach through online access. It would obviously be desirable to install this new scope in our new observatory atop Observatory Hill. Time will tell if this all comes to pass, however I'm optimistic that either BCGC will grant us the funds, or we will raise the funds from our members to make this happen. George would certainly be proud to see Victoria Centre finally have an observatory for our members to use. The online access to this facility will be a bonus to our members who can't observe in the field, and this type of access will also serve the local community well. Ottawa Centre already operates such a facility (SMARTscope), and I'm sure Victoria Centre can be just as innovative and SMART!

Observing has been spotty over the first few weeks of 2007, however our members have managed to do some observing and have captured some superb astrophotographs. Please be sure you browse the main page of our website, which always features the latest images from our members. A chronological listing of our members observations and photos can also be found on the website under Observing Highlights. My personal observing highlight over the last few weeks was certainly the Great Comet McNaught C2006 P1, which is now fading fast, but still visible from the southern hemisphere. What a show!

Joe Carr

address change? information incorrect

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General enquiries - nationaloffice@rasc.ca

A Great Big Wreck

by Dr. Tony Phillips

People worry about asteroids. Being hit by a space rock can really ruin your day. But that's nothing. How would you like to be hit by a whole galaxy?

It could happen. Astronomers have long known that the Andromeda Galaxy is on a collision course with the Milky Way. In about 3 billion years, the two great star systems will crash together. Earth will be in the middle of the biggest wreck in our part of the Universe.

Astronomer John Hibbard isn't worried. "Galaxy collisions aren't so bad," he says. A typical spiral galaxy contains a hundred billion stars, yet when two such behemoths run into each other "very few stars collide. The stars are like pinpricks with lots of space between them. The chance of a direct hit, star vs. star, is very low."

Hibbard knows because he studies colliding galaxies, particularly a nearby pair called the Antennae. "The two galaxies of the Antennae system are about the same size and type as Andromeda and the Milky Way." He believes that the Antennae are giving us a preview of what's going to happen to our own galaxy.

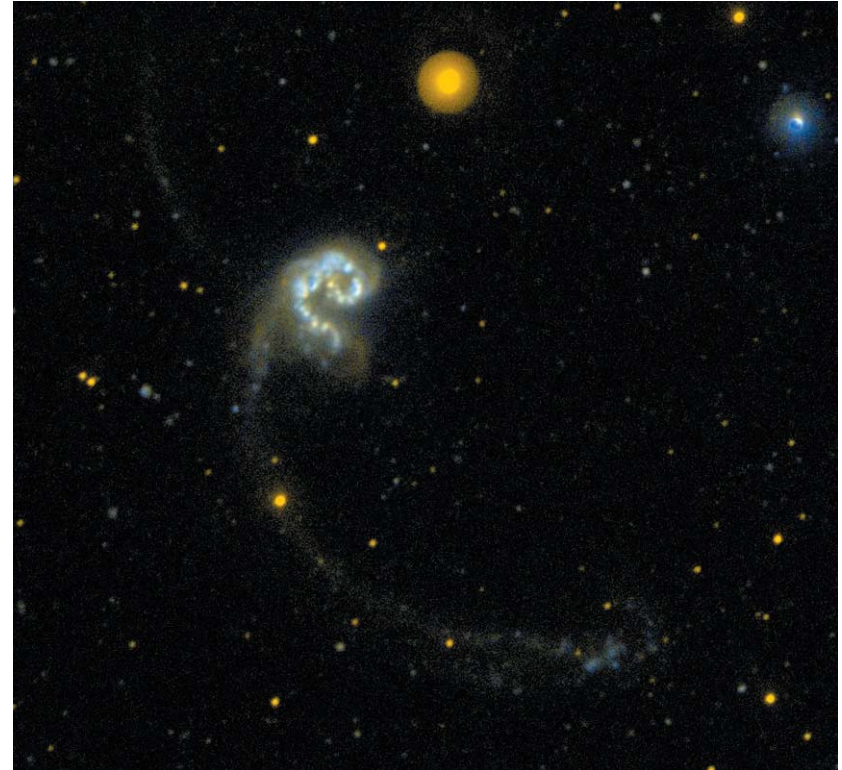
The Antennae get their name from two vast streamers of stars that resemble the feelers on top of an insect's head. These streamers, called "tidal tails," are created by gravitational forces—one galaxy pulling stars from the other. The tails appear to be scenes of incredible violence.

But looks can be deceiving: "Actually, the tails are quiet places," says Hibbard. "They're the peaceful suburbs of the Antennae." He came to this conclusion using data from GALEX, an ultraviolet space telescope launched by NASA in 2003.

The true violence of colliding galaxies is star formation. While individual stars rarely collide, vast interstellar clouds of gas do smash together. These clouds collapse. Gravity pulls the infalling gas into denser knots until, finally, new stars are born. Young stars are difficult to be around. They emit intensely unpleasant radiation and tend to "go supernova."

GALEX can pinpoint hot young stars by the UV radiation they emit

and, in combination with other data, measure the rate of star birth. "Surprisingly," Hibbard says, "star formation rates are low in the tidal tails, several times lower than what we experience here in the Milky Way." The merging cores of the Antennae, on the other hand, are sizzling with new stars, ready to explode.



This GALEX UV image of the colliding Antennae Galaxies shows areas of active star formation, which is not in the tidal tails as one might expect.

So what should you do when your galaxy collides? A tip from GALEX: head for the tails.

To see more GALEX images, visit www.galex.caltech.edu. Kids can read about galaxies and how a telescope can be a time machine at spaceplace.nasa.gov/en/educators/galex_puzzles.pdf.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.