

SKYNEWS



Prince of Wales Tower

by

Charles Banville

IN THIS ISSUE

On the Cover
Presidents Report
February Meeting

Astronomers and The Blue-Grey Taildropper Slug
Planning the 2012 Total Solar Eclipse

NEXT MEETING

March 9th 7:30pm
University of Victoria
060 Elliott Bldg.

www.victoria.rasc.ca

On The Cover

Built by the British army in 1797, the Prince of Wales Tower was one of numerous fortifications that defended Halifax from enemy attack. The tower's main purpose was to protect the landward approaches to the gun batteries located along the shores of what is now Point Pleasant Park. Here the hunter, Orion, trails above the tower.

Date: January 22, 2011

Location: Point Pleasant Park, Halifax, Nova Scotia

Optics: Canon EF 17-40mm f/4L USM

Camera: Canon EOS 7D on tripod

Exposure: 69 light frames of 30 seconds,

President's Report



Out here in our far west coast bit of heaven, we can often forget that there is a National society in central Ontario that is working away for our interests and it is only when the General Assembly decides to increase our dues that we let our thoughts travel much beyond our

island shores. Recently, however, the executive council, made up of representatives from all over Canada, has developed a Strategic Plan that will serve as a guideline for the organization for the next two to three years. There have been meetings, debates, arguments and consultation for several months now. I know that some of you have sent in comments to the council, voicing your own opinions. Our National President, Mary Lou Whitehorne, has recently written to councils to update us on what has been happening and a final statement will be released soon.

The Plan has a Mission statement, a Vision statement, a Values statement and then seven strategic objectives that the RASC will work toward. If you have not seen them or don't know what they are, then I happen to have the summary right here. Take a quick read; it takes about a minute but will give you some insight into what is happening and will be happening with our society.

Mission

The Royal Astronomical Society of Canada (RASC) encourages improved understanding of astronomy for all, through education, outreach, research, publication, partnership, and community. Founded in 1868, the RASC is Canada's leading astronomy organization with local Centres throughout the country.

Vision

To inspire curiosity in all Canadians about the universe, to share scientific knowledge, and to foster collaboration in astronomical pursuits.

Values

The RASC has a proud heritage of excellence and integrity in its programmes and partnerships. As a vital part of Canada's science community, we support discovery through the scientific method. We inspire and encourage people of all ages to learn about and enjoy astronomy.

RASC Seven Strategic Objectives 2011-2013

- Implement Centre Support Program by 2011 June 1.
- Implement Volunteer Support Program by 2011 June 1.
- Improve response time for customer service delivery from one week to three business days by 2011 December 31.
- Increase revenues from present and new sources by 30 percent by 2013 December 31.
- Increase RASC membership to 5000 members by 2013 December 31.
- The Executive Director and MAP Committee will develop a marketing and communications plan by 2010 December 31.
- Make recommendations on By Law reform by 2011 December 31.

What do you think? Would you like more information, particularly about the objectives and why they were chosen? Just reading them here, somewhat isolated from the background discussions that brought them forward, might not be too engaging for the general membership but each objective is responding to a particular problem area such as financing, marketing or communication that has needed some revitalization over the last several years within the society. The objectives are positive steps for pointing the organization in new directions. The entire document is available to members on-line at the National site and I can direct you to it easily.

Key points for me are the Volunteer Support Program that already has presented some of its new initiatives to local centers and the increased attention to augmenting membership at the National level. We already have fantastic volunteers here in Victoria but we can always use some extra support and new ideas. We also want to continue to increase our membership at the local level so the initiatives from National will be welcomed.

Please let me know what you think. If you have any comments or suggestions for programs or initiatives you would like to see our Victoria group or the national organization implement just give me a call. Let's see where this new plan will take us.

February Meeting - David J. Helfand



“ Intelligent Life in the Universe?”

In the last five years, no fewer than 300 new solar systems have been discovered within our local Galactic neighborhood. Observations of newly forming stars suggest more than half spawn planets.

Coupled with discoveries in biology and artificial intelligence, we are in a position to provide a quantitative estimate of the number of intelligent civilizations in the Milky Way. This illustrated lecture will present the results of these calculations, as well as exploring the important issue as to whether or not our species yet qualifies as intelligent life in the cosmic sense.

David J. Helfand is chair of the Department of Astronomy Columbia University as well as the co-director of the Columbia Astrophysics Laboratory. He has also served as part of the university's Physics Department. His stated research interests include radio surveys, the origin and evolution of neutron stars and supernova remnants, and active galactic nuclei. Recently, Helfand has been instrumental in the creation of general education classes oriented around the sciences, developing a course, Frontiers of Science, that has subsequently become part of the Core Curriculum Columbia College, the university's undergraduate liberal arts and sciences division. Dr. Helfand joined [Quest University](http://www.questu.edu) in Squamish, British Columbia, as a Visiting Tutor in 2007 and now

serves as Quest's President. He holds a B.A. from Amherst College and a Ph.D. from the University of Massachusetts, Amherst.

Astronomers and The Blue-Grey Taildropper Slug.

By Dorothy H Paul

Is it farfetched to draw a connection between the plight of astronomers, a sub-group of *Homo sapiens sapiens*, and *Prophysaon coeruleum*, a charming little

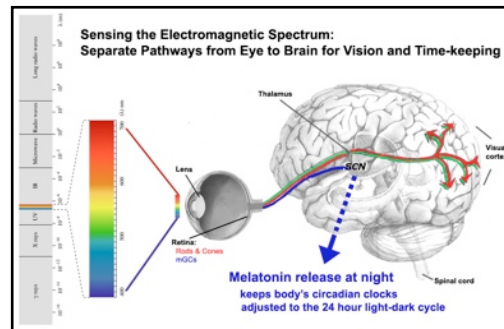


Prophysaon coeruleum, the Blue-grey Taildropper slug. © 2005 Kristina Ovaska

mollusc indigenous to southern Vancouver Island and threatened with extinction due to loss of habitat? Not at all! We both, along with all other organisms, suffer the consequences of bad outdoor lighting, which acts at numerous levels

to degrade our health individually and collectively (1 – 3).

The explanation for the detriments caused by too much light at night is straightforward. All organisms have molecular circadian clocks that keep their myriad physiological processes harmoniously adjusted to function together and in tune with the natural 24-hour light-dark cycle. Plants and animals also use natural night length to anticipate and prepare physiologically for the changing seasons. Lighting up the night artificially prolongs the day and prevents appropriate seasonal as well as daily adjustment of internal biological clocks. The results are sick animals and plants; foraging and migrating animals led astray; predator-prey imbalance; poor pollination rates; breakdown of food chains declining biodiversity; and environmental distress. Our master clock is deep in the brain, in a pair of nerve cell clusters called the SCN (suprachiasmatic



nuclei; see figure). The Blue-Grey Taildropper's circadian clocks are adjacent to their eyes in the 'stalks' projecting forward from their head. In all species, light acts through separate pathways to keep circadian clocks adjusted and to mediate vision or orientation in animals with non-image forming eyes and photosynthesis in plants. The figure illustrates this separation in us. It starts with the absorption of different parts of the visible electromagnetic spectrum by different kinds of cells in the retina: rods and cones for the visual pathway; melanopsin ganglion cells (mGCs) for adjustment of the clock. The neural pathways remain separate, projecting to discrete areas in the brain. Visual perception unfolds as the result of input from the rods and cones to the visual cortex, while coordination of the body's metabolism with the circadian rhythm of light and dark is maintained by input from the mGCs to the 'master' clock in the SCN. The SCN normally release the hormone melatonin at night, and even a short exposure to bright light containing blue wavelengths shuts down melatonin production. The body's multifarious rhythms (body temperature, hormone levels, sleep, mental acuity, motor coordination, digestion, urine formation, gene activity – the list goes on) become deregulated; small wonder that illness ensues (2, 3). Sky glow, the wasted light cast upward from unshielded fixtures, exacerbates air pollution, with all its attendant health effects, because light prevents formation of a naturally occurring nitrogen radical which otherwise would be removing atmospheric pollutants during the night (4). Unfortunately, the mounting evidence for the damage caused by light pollution on health, ecosystems, and the environment continues to receive minor attention (1). Full cut-off (or shielded) light fixtures, properly installed and turned on only when needed, would do more than please astronomers. Keeping all outdoor lights directed to the ground and off when not needed will minimize the environmental impact of light pollution, make people healthier and neighbourhoods safer, by reducing glare and light trespass, improve air quality, and save energy and money. It matters not whether a residence has a yard or garden, fronts on a sidewalk with little or no greenery, or is a condominium or apartment above street level, any light projected outside, including indoor lights shining outdoors when window blinds are left open after dark, adds to the unnatural over illumination of the outdoors at night. Reducing the pervasive, insidious harm caused by light pollution will benefit all species, including ours, help restore the enthralling sight of the natural night sky, and make astronomers even

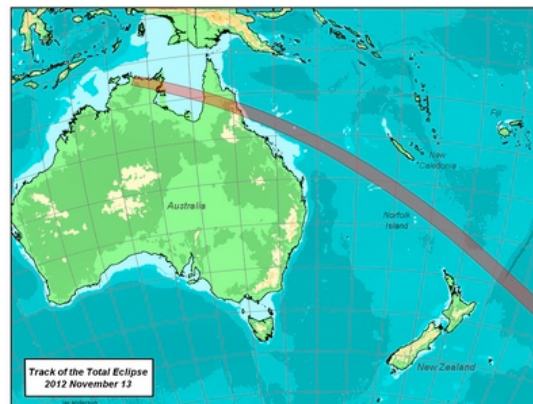
happier than Blue-Grey Taildropping Slugs because we will experience the effect visually!

- * **Slugging it out for survival:** <http://www.hat.bc.ca/recent-press/160-blue-grey-taildropper-stewardship-for-an-endangered-slug-in-victoria.html>
1. Hoelker, F. et al. 2010. **The Dark Side of Light: A Transdisciplinary Research Agenda for Light Pollution Policy.** *Ecology and Society* 15(4):13. <http://www.ecologyandsociety.org/vol15/iss4/art13/>
 2. **Chepesiuk, R. 2009. Missing the Dark: Health effects of light pollution (2009)** <http://ehsehplp03.niehs.nih.gov/article/info:doi/10.1289/ehp.117-a20>
 3. **Light Pollution & Human Health: American Medical Association (2009):** <http://www.britastro.org/dark-skies/health.html> ; <http://www.skyandtelescope.com/news/48814012.html>
 4. **Light Pollution boosts Air Pollution (2010)** <http://www.bbc.co.uk/news/science-environment-11990737> ; http://docs.darksky.org/PR_CityLightPollutionAffectsAirPollution.pdf

Planning for the 2012 Total Solar Eclipse

by Joe Carr

The next Total Solar Eclipse occurs on November 13, 2012 and tracks across northern Australia - the only land along the track. Centreline goes just north of Cairns, Australia through the little beach town of Port Douglas. Tour companies are already offering packages. Although Australia normally offers many options for the traveler, local accommodation will be at a premium, as will transportation services during the eclipse, so if you are interested, booking sooner rather than later would be a good idea.



Here are some reputable travel companies, some of whom are associated with experienced eclipse chasers from RASC Centres:

Civilized Adventures, hosted by Don Hladiuk, RASC Calgary - http://www.civilizedadv.com/trip_pages/trips/2012/AU121106.html

Bestway Tours, hosted by Ralph Chou, Toronto Centre - <http://www.bestway.com/itineraries/t170.php>

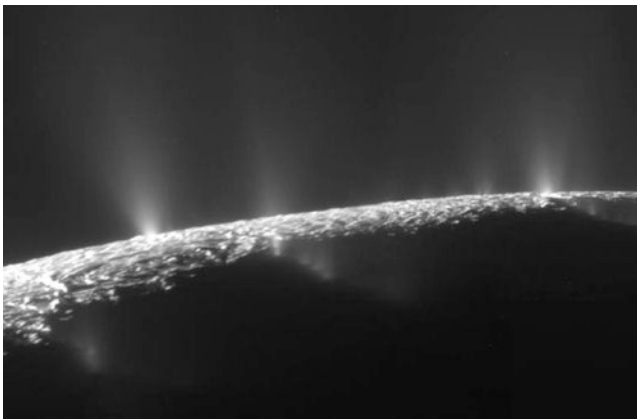
TravelQuest is also a highly respected tour company which specializes in offering astronomy themed travel. If you look under their 2012 heading, they offer **four eclipse tours and a Transit of Venus tour** as well! <http://www.travelquesttours.com/>

Perhaps you would like to travel on highly respected **Fred Espenak's tour** (no prices quoted yet): <http://www.spearstravel.com/astromony/australia12/>

Finally, here is some general information about the 2012 eclipse with lots of useful links from some guy called Mark: http://www.markstravelnotes.com/travelogues/2012/total_eclipse/

Although the **Transit of Venus** is partially visible from here in Victoria, you will need to travel to Hawaii or another Pacific Island to view its entirety. <http://www.transitofvenus.org/>

A Fizzy Ocean on Enceladus



January 26, 2011: For years researchers have been debating whether Enceladus, a tiny moon floating just outside Saturn's rings, is home to a vast underground ocean. Is it wet--or not? Now, new evidence is tipping the scales. Not only does Enceladus likely have an

ocean, that ocean is probably fizzy like a soft drink and could be friendly to microbial life.

The story begins in 2005 when NASA's Cassini probe flew past Enceladus for a close encounter.

"Geophysicists expected this little world to be a lump of ice, cold, dead, and uninteresting," says Dennis Matson of NASA's Jet Propulsion Laboratory. "Boy, were we surprised!"

Cassini found the little moon busily puffing plumes of water vapor, icy particles, and organic compounds out through fissures (now known as "tiger stripes") in its frozen carapace. Mimas, a nearby moon about the same size, was as dead as researchers expected, but Enceladus was precociously active.

Many researchers viewed the icy jets as proof of a large subterranean body of water. Near-surface pockets of liquid water with temperatures near 320 F could explain the watery plumes. But there were problems with this theory. For one thing, where was the salt?

In initial flybys, Cassini's instruments detected carbon, hydrogen, oxygen, nitrogen, and various hydrocarbons in the plume gasses. But there were none of the elements of salt that ocean water should contain.

In 2009 Cassini's cosmic dust analyzer located the missing salt – in a surprising place.

"It wasn't in the plume gasses where we'd been looking for it," says Matson. "Instead, sodium and potassium salts and carbonates were locked up in the plumes' icy particles.* And the source of these substances has to be an ocean. Stuff dissolved in an ocean is similar to the contents of these grains."

The latest Cassini observations presented another intriguing discovery: thermal measurements revealed fissures with temperatures as high as -120o Fahrenheit (190 Kelvin).

"This discovery resets our clocks!" says Matson.

"Temperatures this high have to be volcanic in origin. Heat must be flowing from the interior, enough to melt some of the underground ice, creating an underground waterworks."

The finding has led the scientists to ponder how contents of an ocean capped by a crust of ice as much as tens of miles thick could reach the surface.

"Have you ever been sprayed when you popped the top of a soda can?" asks Matson.

The model he and his colleagues propose suggests that gasses dissolved in water deep below the

surface form bubbles. Since the density of the resulting "sparkling water" is less than that of the ice, the liquid ascends quickly up through the ice to the surface.** "Most of the water spreads out sideways and 'warms' a thin surface ice lid, which is about 300 feet thick," explains Matson. "But some of it collects in subsurface chambers, builds up pressure, and then blasts out through small holes in the ground, like soda spewing out of that can you opened. As the remaining water cools, it percolates back down to replenish the ocean and start the process all over again."

Another mystery remains: "Where's the heat coming from on this tiny body?" wonders Larry Esposito of the University of Colorado. "We think tidal heating could be contributing."

Saturn's powerful tides actually cause the shape of Enceladus to change slightly as it orbits. Flexing motions in the moon's interior generate heat--like the heat you feel in a paperclip when you rapidly bend it back and forth. In this model, internal friction powers volcanic activity, which warms and melts the ice.

"It's clear now that, whatever is producing the heat, Enceladus meets many requirements for life," says Esposito. "We know it has a liquid ocean, organics, and an energy source. And to top it off, we know of organisms on Earth in similar environments."

No one knows for sure what's going on under the ice, but it seems this little moon has quite a story to tell: erupting jets, an underground ocean, the possibility for life.

And they thought this place was dull.

ASTRONOMY CAFE (EACH MONDAY)

**ASTRONOMY
CAFÉ**



Fairfield Community Centre

1330 Fairfield Rd. Victoria,

7:30pm - 10 pm

Contact: Malcolm Scrimger
(250) 250 508 6483 for directions
and information.

New comers are especially
encouraged.



New Observers Group

Hosted by Sid Sidhu

Held last Friday of each Month.

1642 Davies Road, Highlands.

Call 250.391-0540 for information
and directions.



Email Lists

Observer / CU Volunteers / Members

Contact Joe Carr to subscribe
webmaster@victoria.rasc.ca

March Meeting

Wednesday 9th - 7:30pm

University of Victoria

Elliott building - Room 060

RASC Victoria Council for 2010 / 2011

Past President
John McDonald
pastpres@victoria.rasc.ca

Secretary / Recorder
Mark Bohlman
secretary@victoria.rasc.ca

National Representative
Chris Gainor
nationalrep@victoria.rasc.ca

President
Lauri Roche
President@victoria.rasc.ca

Librarian
Michel Michaud
librarian@victoria.rasc.ca

Light Pollution Abatement
Mark Bohlman
lpa@victoria.rasc.ca

First Vice President
Nelson Walker
vp@victoria.rasc.ca

Website / E mail lists
Joe Carr
web@victoria.rasc.ca

Membership Coordinator or
Membership Liaison
Chris Saunderson
membership@victoria.rasc.ca

Second Vice President
Sherry Buttner
vp2@victoria.rasc.ca

Skynews Editor
Malcolm Scrimger
editor@victoria.rasc.ca

Members at Large

Bill Almond, Jim Hesser, David Lee, Alex
Schmid

Treasurer
Li-Ann Skibo
treasurer@victoria.rasc.ca

Telescopes / School Programs
Sid Sidhu telescopes@victoria.rasc.ca