



Gary Boyle - The Backyard Astronomer

# Dodging A Solar Bullet

By Gary Boyle - The Backyard Astronomer

For the most part, this past February 15 seemed like any ordinary day. We recognized Flag Day as the Canadian maple leaf that was first raised in Ottawa in 1965. But things played out differently on the surface of the sun with a huge explosion known as a Coronal Mass Ejection (CME) into space. The good news for us, this intense X-class occurred on the far side of the sun with the particles moving away from us. This class flare is the most powerful on the scale.

The sun is a huge ball of hot plasma, spanning the width of 109 earths lined up side by side like a string of pearls at its equator. The immense energy is produced at the sun's core. Every second 600 million tons of hydrogen is converted into 595 million tons of helium. The remaining five million tons results in pure energy that helps sustain life here on earth. This has been going on for the

last 4.6 billion years and will continue for another 4 to 5 billion more.

Over the sun's eleven-year solar cycle, internal magnetic field lines begin to twist, building up energy. Eventually, this energy is released in solar flares, forming large loops that are anchored to the solar disk. However, there are times when the flare's energy is so intense, a CME explodes off the surface, travelling through the solar system via the solar wind. On a calm day, the solar winds blow at about 350 kilometres per second but a very intense explosion can race up to 2,000 kilometres per second. When a cloud encounters the earth, it can set off spectacular Northern Light aka the Aurora Borealis. On a typical day, about 20 flares are seen on the surface of the sun.

When our atmosphere interacts with a solar storm, it helps balloon our atmosphere and is extremely dangerous for satellites. They can malfunction or be dragged

down and destroyed as they burn up in the atmosphere. This occurred with a geomagnetic storm that hit the earth on at the end of January, bringing down 40 of the 49 Starlink satellites SpaceX had just sent up. This new batch had not reached its operating altitude and fell out of the sky costing about \$20 million.

Another hazardous factor is if the CME had been angled toward earth, our planet could have been in serious trouble. Solar storms such as these can destroy power grids such as the Quebec blackout of March 13, 1989, when transformers melted. One of the most intense storms to hit the earth was called the Carrington Event of September 1-2, 1859. Teletype machines were still able to transmit messages even with the batteries disconnected. There were even reports of the paper and machines catching fire. The aurora was so bright, prospectors searching for gold, woke up in the middle

of the night. They started making breakfast thinking the sun was rising.

At some point in the future, we will eventually be hit by another such Carrington Event. When it does, power grids will be affected or fail, impacting our everyday lives. We rely so much on electricity and the Internet for city and country infrastructure. We dodged a solar bullet on February 15. The present solar cycle is ramping up to the height of Solar Max, sometime in July 2025. From now till then will be a greater chance of seeing the shimmering Northern Lights.

Known as "The Backyard Astronomer", Gary Boyle is an astronomy educator, guest speaker and monthly columnist for the Royal Astronomical Society of Canada as well as past president of the Ottawa Centre of the RASC. He has been interviewed on more than 50 Canadian radio stations as well as television across Canada and the US. In recognition of his public outreach in astronomy, the International Astronomical Union has honoured him with the naming of Asteroid (22406) Garyboyle. Follow him on Twitter: @astroeducator, Facebook and his website: www.wondersofastronomy.com

## The Shoreline Journal Tid-Bits

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### Renewable Energy Moves Forward

The Province's independent procurement administrator, CustomerFirst Renewables, is moving forward with a request for proposals (RFP) on February 11, for wind and solar energy projects that will supply 10 per cent of the province's electricity. These projects will generate 350 megawatts of low-cost renewable energy and reduce Nova Scotia's greenhouse gas emissions by more than one million tonnes annually.

"This represents the largest potential to reduce greenhouse gases from a single government procurement," said Tory Rush-ton, Minister of Natural Resources and Renewables. "We are committed to have 80 per cent of Nova Scotia's electricity needs supplied by renewable energy by 2030, and the projects that come from this RFP will play a critical role in helping us achieve that goal."

Wind and solar are both low-cost sources of electrical energy in Canada, making this RFP the most economical pathway to reduce a significant amount of greenhouse gases.

Up to five projects are expected to be selected from the process. They are expected to create upwards of 2,000 direct and indirect jobs over their lifetime, mostly in rural Nova Scotia, and generate more than \$550 million in construction activity.

The Province is in the final phase of negotiations with the Canada Infrastructure Bank on financing options for bidders.

## OBITUARIES

MAIL TO: Box 41, Bass River, NS B0M 1B0

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**WHITE, Donald** Blanchard "Don" - 74, Belmont. It is with broken hearts that we, the family of Don White, announce the sudden passing at Colchester East Hants Health Centre, Truro, on Wednesday, February 16, 2022, as the result of a massive stroke. Don was the son of the late Walter and Ellen (Blois) White of West Gore and Truro. Arrangements have been entrusted to Mattatall - Varner Funeral Home, 55 Young Street, Truro, where Don's funeral service was held Thursday, February 24, 2022, Reverend Glenn MacLean officiated. Full obituary, condolences and webcast of funeral at: www.mattatallvarnerfh.com

**HANES, Ronald** "Ronnie" F.E. - Age 67, of Belmont formerly of Truro, passed away on Wednesday, February 23, 2022, in Colchester East Hants Health Centre, Truro. He was a son of the late Ronald and Eudora (Lindsay) Hanes. Ronnie is survived by his children, Lisa, Jimmy (Shannon), Sara, Crystal, all of Ontario; grandchildren, Makayla, Jackson, Michael, Felicity, Faith, Katie, Zoey, Jace, Drayton, Michael and Breanna; brothers, Donnie (Sherri), B.C., Wayne, B.C.; sisters, Rose (Roger), Tatamagouche, Janet, Hilden; brother-in-law, Allan, Truro, as well as several nieces and nephews. Besides his parents, Ronnie was predeceased by his sister, Sheila; brother-in-law, Billy and son-in-law, Mike. Ronnie was a truck driver for many years of his life. He drove a cement truck for Casey Concrete for a number of years. He had a love of driving. In his later years, you would find Ronnie driving around with friends and family, taking them to different appointments, shopping, banking, the liquor store and getting groceries. He was also the "DD" to many. You could always find him at the Debert Tim Hortons chatting with the boys. The greatest joys of his life were his grandchildren. Cremation has taken place. A Celebration of Life will be held on Wednesday, March 23, 2022 from 2 - 4pm, once COVID-19 restrictions have been lifted. In lieu of flowers, donations may be made to V.O.N. or charity of choice. Arrangements have been entrusted to Colchester Community Funeral Home, 512 Willow St., Truro, N.S. Online condolences may be sent to the family by visiting www.ColchesterCommunity.com

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