

Volume 24, Number 00

PETERBOROUGH
ASTRONOMICAL ASSOCIATION
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THE REFLECTOR

Newsletter and Journal

of the

**PETERBOROUGH ASTRONOMICAL
ASSOCIATION**

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Welcome to the newsletter and journal of the Peterborough Astronomical Association (PAA). We are a group of people from Peterborough, Ontario and surrounding areas who love and appreciate the space surrounding us. We are also interested and passionate about viewing and preserving the night sky. As well we enjoy observing celestial events that occur during the day!

The PAA meets on the first Friday of each month at 7 p.m., except for July and August, in the Rotary Education Centre in the new Guest Services Building at the Riverview Park and Zoo. These meetings are available by Zoom for remote participants.

Editor: Mike Milton
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THE NEWSLETTER

INTRODUCING OUR NEW SECRETARY *DAVID MESSERVEY*

Thanks to a successful (and uncontested!) election of me to the position of Secretary of the PAA at the December 2025 AGM, I thought it prudent to provide a brief introduction of myself to the PAA membership.

But first, I must acknowledge the vast amount of work done by my predecessor, Michelle Anstett, over many years of dedicated support for this organization. In particular, I was especially impressed by Michelle's patience and diligence in working through the most recent updates to the PAA Bylaws - not an easy task, by any means!



As for me, I am a Peterborough lad. My father, Bill, was an electrical engineer with CGE (as it was known then) for 40 years. I grew up in Peterborough, attending Prince of Wales Public School for a couple of years, then Queen Mary until I moved to the brand-new Westmount Public School - circa 1958. Then on to PCVS, where, among other interests, I played trumpet in the concert and Dixieland jazz bands. My mother, Kay, was a piano teacher, so music was very much a part of our family's activities.

I attended Queen's University, graduating with a degree in Mechanical Engineering in 1970. My wife, Judy, and I recently attended our class's 55th-year reunion - hard to believe the time has gone by so quickly! In keeping with the music theme, I enjoyed playing trumpet in the Queen's marching band, complete with kilt and spats, at all of the Gael's football games, home and away. Good times.

Some of you may remember Routley's grocery store on Park Street, where the Wine Shoppe is now located. That was the site of my first job after graduation. It afforded me the flexibility to travel on my motorcycle that summer, including a 5-week trip to the Maritimes and New England with one of my fellow engineering buddies.

My first engineering job was at 3M Company in London, Ontario. It was a fortunate coincidence, as it was there that I met my future bride, Judy. We were married in 1976. We have 3 sons and 5 grandchildren.

In 1978, I accepted a job offer from the manager of DC Machines and Transportation Equipment Engineering at CGE Peterborough. My initial design work focused on rotating electrical equipment for locomotives built by Montreal Locomotive Works. Being somewhat of a train buff, I enthusiastically accepted the offer, which marked the beginning of a 34-year career at GE Canada, including several managerial roles within the engineering department.

One of my related activities since retiring in 2012 has been serving as secretary of the not-for-profit corporation Friends of Hope Mill, established in 2017 to assume responsibility for the operations of this historic water-powered sawmill on the Indian River.

I'll be the first to admit that my knowledge of astronomy is very limited. During COVID, I learned that the PAA was starting to host meetings via Zoom, which appealed to me. Having known a couple of very enthusiastic PAA members from our association at GE, Rodger Forsyth and Sean Dunne, I decided to join the PAA and hopefully become a bit more knowledgeable about the subject.

My experience thus far? I have learned that the subject is vast and, like many hobbies, can be enjoyed in a variety of ways, depending on one's area(s) of interest and technical abilities.

I look forward to helping maintain the vitality of the PAA through my secretarial duties.

David Messervey

SHOOTING STARS AND RASPBERRY
PI'S:
CAPTURING THE GEMINIDS FOR
SCIENCE WITH THE GLOBAL METEOR
NETWORK
BY TIM CLAYDON



GMN meteor camera (CA002F) at Trent University Peterborough records the Geminids Dec. 13th

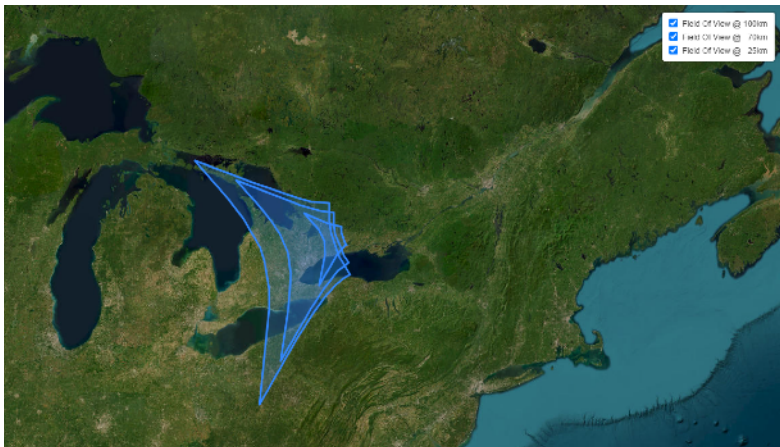
Each December, the Geminids meteor shower delivers one of the year's most reliable celestial spectacles, flinging bright—often multicoloured—meteors across a typically moonless winter sky. In 2025, observers under dark conditions saw rates approaching 120 meteors per hour, with peak activity occurring between the nights of December 13 and 14.



Setting up our camera

Unlike many annual showers that favour the early morning hours, the Geminids begin shortly after sunset. Their bright, slow-appearing streaks

radiate from the constellation Gemini and criss-cross the northern hemisphere. Travelling at roughly 30–40 kilometres



Our camera's Field of View

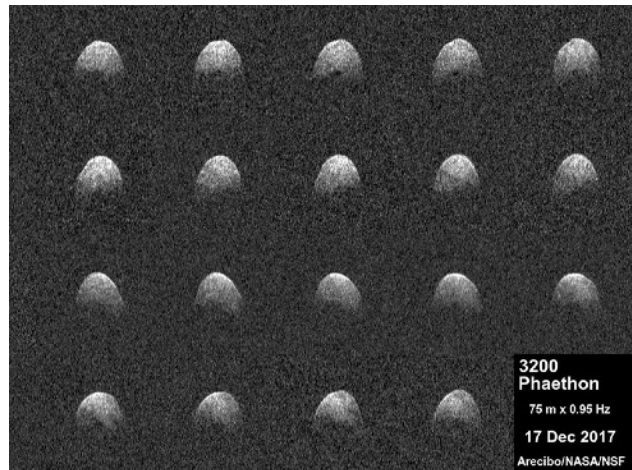
per second, Geminid meteors often glow yellow, green, or blue as different elements vaporize while plunging through Earth's upper atmosphere.

Behind this visual display lies a more unusual origin story. Most meteor showers come from comets—icy “dirty snowballs” that shed debris as they warm near the Sun. The Geminids, however, originate from a rocky asteroid known as 3200 Phaethon. Roughly 5–6 kilometres across, Phaethon follows a highly elongated orbit, circling the Sun every 1.4

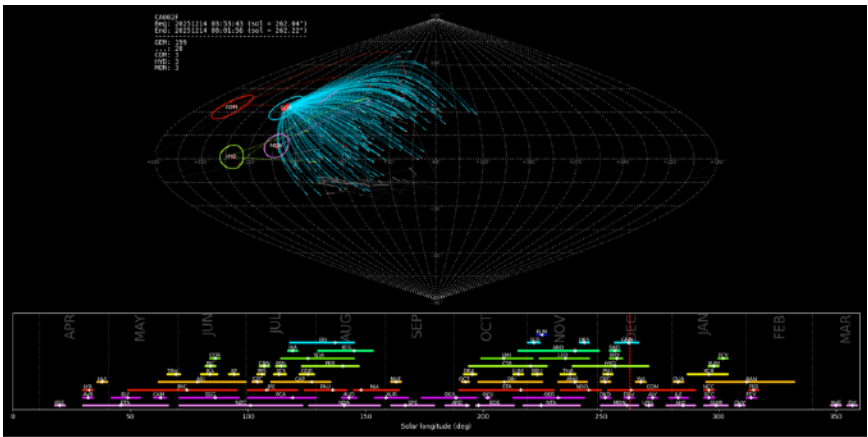
years and approaching to within 20 million kilometres (0.14 AU), about half Mercury’s orbital distance. Near perihelion, its surface heats to over 750 °C—far too hot

for surface ice—making its ability to supply such a dense debris stream a longstanding puzzle.

The Geminid meteoroid stream consists of countless pea- to gravel-sized rocky fragments following Phaethon’s orbit. Each December, Earth plows through this debris, compressing and heating the air ahead of incoming particles until both the air and meteoroid glow, producing the brief streaks we see as meteors before they vaporize.



Arecibo radio telescope image



CA002F Geminid's Radiants Dec 14 2025

Because Geminid particles are denser and more robust than typical cometary debris, they tend to penetrate deeper into the atmosphere, creating brighter trails and occasional dramatic fireballs. In rare cases, especially bright fireballs can survive to the ground as meteorites—valuable samples of material left over from the Solar System’s formation.

Although 3200 Phaethon itself is likely over 4.6 billion years old, its current sun-skimming orbit may be only 600 to 2,000 years old. Observations from missions such as NASA’s Parker Solar Probe, combined with orbital modelling, suggest the Geminid stream may have formed in a violent, catastrophic event—such as a high-speed impact or explosive disruption—rather than slow, comet-like shedding. This has led some researchers to describe Phaethon as a rare “rock comet.”

Documenting these celestial fireworks in a scientifically meaningful way is the role of the Global Meteor Network (GMN). This worldwide array of low-cost, highly sensitive video cameras operates every night, recording meteors automatically. Each station uses a Raspberry Pi running open-source software to detect meteor tracks, measure their paths, and upload data for centralized processing.

The network's goals include building long-term records of meteor activity, identifying unknown outbursts, and determining the origins of meteorite-producing fireballs. As of December 2025, more than 1,300 GMN cameras operate in 40 countries.

When multiple stations observe the same meteor, software triangulates its trajectory and reconstructs the meteoroid's orbit, revealing whether it belonged to a known stream like

the Geminids or was a sporadic visitor from elsewhere in the Solar System. Stations record velocities, heights, brightness, and flight paths, creating a rich, publicly available archive.



Fireball and its trajectory

For the Geminids in particular, continuous monitoring helps explain why the shower appears to be strengthening over time, how Phaethon's debris stream is evolving, and whether Earth may encounter dense clumps capable of producing future outbursts or fireballs. This work also refines impact-risk models for satellites and for humans working in space, including astronauts aboard the International Space Station.



Tims MeteorCam CA000L

Participation is open to amateurs, schools, and community groups. A typical GMN station consists of a low-light CMOS security camera (often using a Sony IMX sensor), a Raspberry Pi 4 or 5 running the RMS software, a Power-over-Ethernet adapter, and basic mounting hardware. Total costs are typically \$300–\$400 CAD. GMN provides detailed build guides,

preconfigured software images, and even plug-and-play systems for those who prefer minimal setup. Once installed, a station operates quietly all night, uploading detections each morning to central servers at Western University in London, Ontario, where the data becomes part of a global research dataset.

There are lighter perks as well. Hosting a GMN camera makes your home an official node in a worldwide space-monitoring network—far more impressive than a doorbell camera. Over breakfast, you can review the previous night’s detections to see whether your rooftop station helped reconstruct the orbit of a fireball. For educators, a GMN installation transforms classrooms or small observatories into living laboratories, where students work with real trajectories, radiant, and flux measurements rather than textbook diagrams.

With networks like the Global Meteor Network watching, the Geminids are no longer just a fleeting winter spectacle. They are a precisely measured cross-section of an evolving debris stream, traced back to a small, overheated “rock comet” racing around the Sun. And should the next brilliant fireball yield a recoverable meteorite, its scientific story may begin with a modest camera quietly watching the night sky from your own wall or rooftop.



Tim Claydon

MEETING DR. DAVE. RICK STANKIEWICZ

Open the door when opportunity knocks because you never know when you will have that opportunity again. This is exactly what I did when I learned of a potential opportunity to meet yet another Canadian astronaut. In early December, I was notified that the Ontario Science Centre was hosting an event with **Dr. Dave Williams** at their



Mississauga location in the Sherway Gardens Mall on Sunday, December 7th. I signed up and secured an advance ticket to guarantee my spot for this one-time event. Believe me when I tell you, it was worth the price of admission (\$15.00).

Canada's seventh astronaut in space, Dr. Dave Williams, started with a brief overview of his background (Emergency

Room Doctor) and how he entered Canada's fledgling astronaut program and successfully flew two Space Shuttle missions (STS-90 & 118),



including being a cancer survivor and going on to his second mission and helping to build the International Space Station (ISS).

By the end of his illustrious space career, Dr. Dave had logged more hours in space performing extravehicular activities (EVAs) or “space walks” than any other Canadian. His three EVAs totalled 17 hours and 47 minutes in space.

Only three other Canadians have performed EVAs. By the numbers, in

descending order, they are Chris Hadfield (2, totalling 14 hr & 50 min), Steve MacLean (1, totalling 7 hr & 11 min), and David Saint-Jacques (1, totalling ~ 7 hr). He showed images from his missions and of fellow crew members that you would rarely otherwise see.



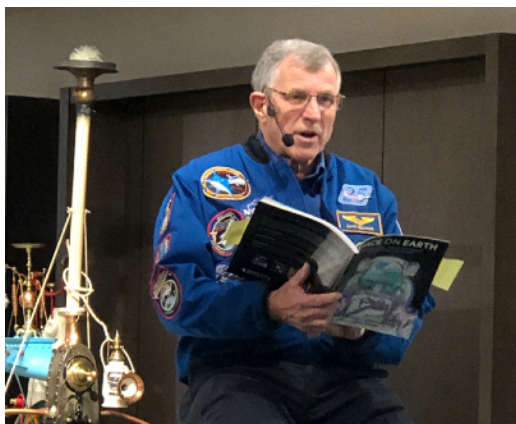
Then there was a chance for some questions and answers,



and the focus was clearly on the kids who were there with their parents that day.

Without fail, there is always someone who wants to hear about how you go to the bathroom in space. I was interested to hear his stories about astronauts who get sick in space and what their options are when they are not close to their “sick bags” and feel the urge.

Next, Dr. Dave read from his fifth and most recently



published children's book, ***Space on Earth: How Thinking Like an Astronaut Can Help Save the Planet***. Luckily, these were on sale at the onsite Science Centre bookstore, and I managed to purchase a couple before they flew off the shelf.

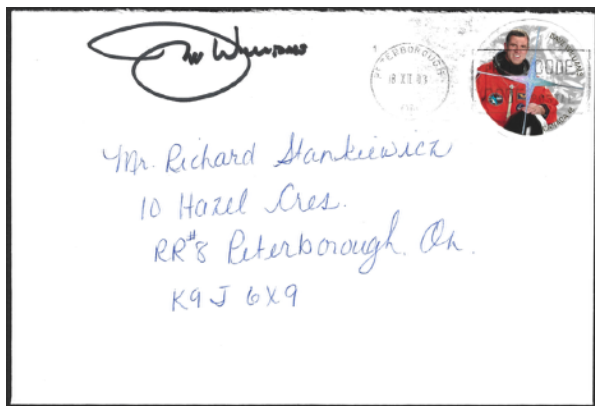
What followed was the moment I had been waiting for, the requisite “book signing”. I waited patiently at the end of the line of kids and parents.

Some were even dressed in astronaut attire... the kids, that is, not the adults. My strategy paid off because there was no pressure from waiting crowds following me, so I had a chance to chat a bit with Dr. Dave.



I was not about to miss an opportunity to try to get a few personal items signed by Dr. Dave, and for me it was “mission accomplished”, with a few more philatelic (stamp) and numismatic (coin) items to add to my collections.

I took some stamp related items, including a self addressed envelope that had Dr. Dave’s 2003 issued stamp affixed to it.



To be honest, I had not planned on any coin related items being an option, but when I realized that day Dr. Dave had the record for the most and longest Canadian EVA's,

I searched my wallet and found a \$5.00 note in good condition, so I added it to my items to be signed, as it just seemed so appropriate, given the design of an EVA by a Canadian astronaut being depicted on the back of the note.

However, when it came time to present the note for signing, he looked at me and said, “Can I sign this?” and I answered without hesitation, “Chris Hadfield already has, so I think you’re okay.” and then he immediately signed it.



You see, last winter I had Chris Hadfield sign another \$5.00 note of mine, not only because he had also done a couple of space walks, but because he had

introduced this new design of our \$5.00 note to the world, while he was commander of the ISS in April 2013. These notes were not released for circulation by the Canadian Mint until November 2013 and have remained in circulation to this day.

To top it off, I was able to get my picture with Dr. Dave after he signed a couple of copies of his latest book for some of my grandkids, which would become unique and extra-special Christmas presents.

This would be the fifth Canadian astronaut I have had the privilege of meeting in person, since first meeting Chris

Hadfield in 2001, launching me on a quest to meet as many as I can. At that moment, I thought to myself, Dave Williams may have floated in space, but I was walking on air!



On this day, I got an early Christmas present and I pray that you were equally blessed this past Christmas Season by having some of your dreams come true. May your New Year be looking up!

Space Collector,

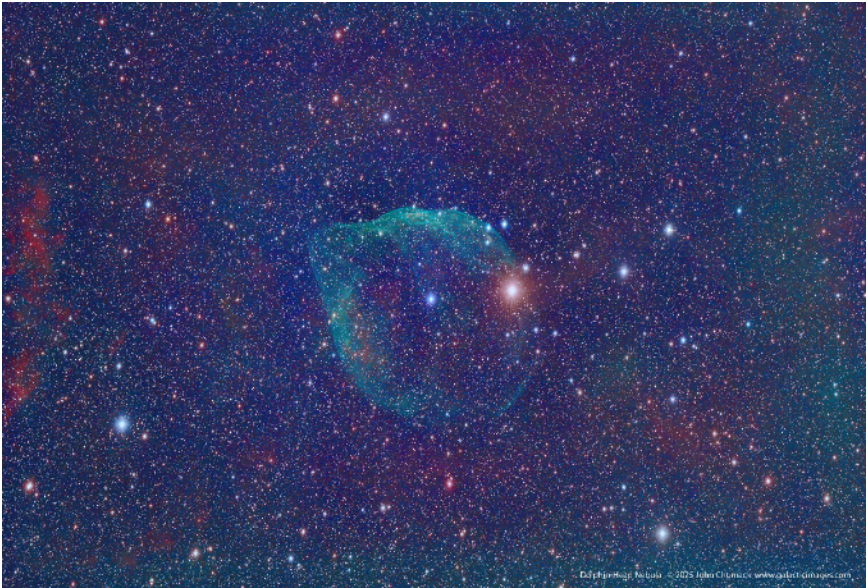
Rick Stankiewicz

(For more on Dr. Dave Williams and his autobiographical book, see The Reflector – June, 2025 Vol.24 No.4)

THE DOLPHIN-HEAD NEBULA - RCW 11

JOHN CHUMACK

Please put this image up full screen to really see all those stars and the details of the Dolphin-head Wolf-Rayet Star bubble!



Also designated as Sharpless 308, RCW 11, or LBN 1052, and commonly known as the Dolphin-Head Nebula. This is an HII region located near the center of the constellation Canis Major (The Big Dog).

The Intense ultra-violet radiation from a Wolf-Rayet Star has produced the faint blue Bubble like structure, this star is located near the center (blue).

The bright Orange star near the edge of the structure is EZ Canis Majoris.

At its known distance(4,530 Ly) the diameter of the Dolphin-head structure would be about 60 light years.

I really like this very dense and colorful star field, but the Dolphin-Head nebula is very faint for my Bortle 7-8 Skies, and I had to wait for an extremely transparent night as it sits really low in the South for my location, just barely clearing the trees at my observatories.

Captured details: this is visible light only, no narrow band!

RASA 8 F2.0, ZWO 294mc cooled Cmos camera, AM5 Harmonic Mount, no filters, ASI Air Wi-Fi to I-pad,

14 x 300sec, 70 minutes total exposure time on 11/17/2025 from my observatories at JBSPO in Yellow Springs, Ohio.

Best Regards,

John Chumack

UPDATE: INTERNATIONAL OBSERVE THE MOON NIGHT RICK STANKIEWICZ



Another year has come and gone and the PAA once again participated in NASA's annual International Observe the Moon Night (IOTMN) for 2025, on October 4th.

It was a nice night to be out, but unfortunately a disappointing one for participation, with both the PAA membership and the public. For those of us who showed up (Jason L., Dave M., Brian K., Andrea F., Dianne D., and me), it was still worthwhile, as the Moon and Saturn were worth looking at, and we had ample time to try out various eyepieces for the best views of lunar and planetary subjects, using 8" to 12" OTAs.



At last year's event, however, NASA and almost every other federal agency in the U.S. government were shut down due to funding issues (politics).

This did little to promote the program at the time, and I know for sure that the focus on and excitement around the Toronto Blue Jays and their run for the World Series did not help us get people out on a Saturday night to look at the Moon or anything else. Maybe a total of two dozen people showed up.



Eventually, NASA was back to work, but well after the completion of the 2025 IOTMN event and they tallied up the results from all those that participated with events around the world and on December 18th they posted their “Recap”:

[International Observe the Moon Night 2025 Recap](#)

Unfortunately, the PAA's participation was not submitted in time to make their Recap, so the more accurate results show that globally there were 5,460 total registrations, 1,075 events, and over 1 million participants worldwide! Every year, the PAA is proud to be part of such a huge international effort, especially as we lead up to humankind's return to the Moon in 2026 (fingers crossed).

We should be looking forward to the next IOTMN, so save the date for Saturday, September 19th, 2026! See you at our usual public meeting spot, the Harold Town C.A.

Your Local Lunatic,

Rick S.

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Khan Scope

THE EDITOR

I'm interested in hearing about anything you'd like to submit or suggest for inclusion in the newsletter or journal.

Just let me know before the last weekend of any month.

Please write up something! I can help you do that - or just proofread and make suggestions.

If that isn't your thing, all tips are welcome as well. If you have heard about something interesting but only want to bring it to my attention, I'll try to develop the idea for the next or future issues of the reflector.



Mike Milton