Orbit

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Royal Astronomical Society of Canada

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November, 2017

Issue Number 1, November, 2017
Roger Hill, Editor

Welcome to the first edition of Volume 50 of Orbit!

Orbit was produced as a newsletter by the legendary Hamilton Centre member Ken Chilton, and it came out roughly every quarter. It didn't take long before it was published 10 times a year...once for each General meeting, and although there was a period of time while the Hamilton Centre re-organized and re-invigorated itself when no-one volunteered to be the editor, it has essentially remained that way.

When Orbit was paper based, there was a team that produced it. Initially, Ken typed the entire thing on Gestetner masters, ran off the pages on the Gestetner machine, stapled it together, and it was handed out to every member who attended a general meeting. The remainder where then mailed out. People would often arrive early enough to read Orbit before the start of a meeting.

The Gestetner process was a pain. The master consisted a backing, with a waxy layer on one side. Typewriter keys could cut through the wax and when this master was attached to a drum, ink would flow through cuts in the wax, onto a sheet of paper. A mistake was not easy to correct, and it was difficult for a manual typewriter to produce a "master" due to the unevenness of pressure. Also, it was not unknown for letters such as a, b, g,and o to have the centres of them knocked out, producing a solid blob of ink.

The first computer-controlled master was produced in 1977 by me. I was working at Canada Centre for Inland Waters at the time on a Co-Op work term from the University of Waterloo. The group I was working for had a small Hewlett-Packard desktop computer, and it had a daisy-wheel printer. I wrote a program that would allow you to input text, print it out for review, fix any mistakes and then print out a good copy. What was cool about this was that I could adjust the spacing between characters, so it could be left and right justified. The first attempt to create a Gestetner master this way was a failure...the printer would not strike hard enough to cut through the wax. This was relatively easy to change, though, and it turned out that if you overprinted every letter 10 times, then it worked out fine. The worlds first word processor, Electric Pencil, was written a scant few months before my program, and I sometimes wonder what would have happened if they'd bought an Altair or a Sol computer, rather than the HP!

There was often an "Orbit Committee", which I never attended, who would take the sheets of paper and march around a table putting them together in the right order. In the 1980's, we switched to using PC's, dot matrix printers and then photocopying the pages. The Front cover was specially produced at a print shop on thick paper, or thin cardstock, and a year's supply was bought at a time. The 25th Anniversary, produced by Eric Golding, was a special run on silver coloured paper.

Changes to Canada Posts rate structure meant that we had to put Orbit into plastic bags for mailing. In the 90's, Orbit was produced electronically, and could be found on our web site. The 2000's saw us move to a completely digital version, which meant that the Orbit Committee was no longer needed, and the editor became solely responsible for the content.

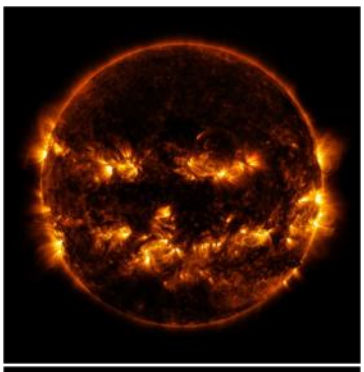
This is the 99th edition of Orbit that I have been in charge of, and I'm still enjoying doing it.

Thanks for reading,

Roger

Spooky in Space: NASA Images for Halloween By Linda Hermans-Killiam

Have you ever seen a cloud that looks sort of like a rabbit? Or maybe a rock formation that looks a bit like an elephant? Although you know that a cloud isn't *really* a giant rabbit in the sky, it's still fun to look for patterns in images from nature. Can you spot some familiar spooky sites in the space images?

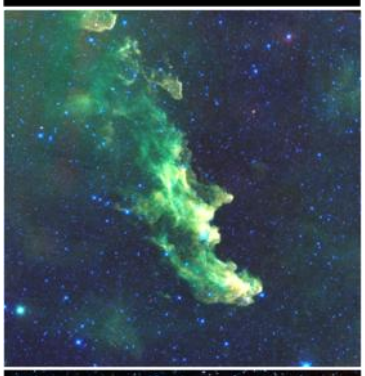


This might look like the grinning face of a jack-o'-lantern, but it's actually a picture of our Sun! In this image, taken by NASA's Solar Dynamics Observatory, the glowing eyes, nose and mouth are some of the Sun's active regions. These regions give off lots of light and energy. This causes them to appear brighter against the rest of the Sun. Active regions are constantly changing locations on the Sun. On the day this image was captured, they just happened to look like a face!

Credit: NASA/GSFC/SDO

This is a Hubble Space Telescope image of Jupiter. Do you notice something that looks like a big eye peeking back at you? That's actually the shadow of Jupiter's moon Ganymede as it passed in front of the planet's Great Red Spot. Jupiter's Great Red Spot is a gigantic, oval shaped storm that is larger than Earth and is shrinking. It has been on Jupiter for several hundred years, and its winds can swirl up to 400 miles per hour!

Credit: NASA/ESA/A. Simon (Goddard Space Flight Center)



Can you see the profile of a witch in this image? This image, from NASA's Wide-Field Infrared Survey Explorer, shows the Witch Head nebula. The nebula is made up of clouds of dust heated by starlight. These dust clouds are where new stars are born. Here, the dust clouds happen to be in the shape of an open mouth, long nose and pointy chin.

Credit: NASA/JPL-Caltech

The Black Widow Nebula looks like a giant spider in space. It is a huge cloud of gas and dust containing massive young stars. Radiation and winds from these stars push the dust and gas around, creating a spider-like shape. This image is from NASA's Spitzer Space Telescope.

Credit: NASA/JPL-Caltech/Univ. of Wisc.

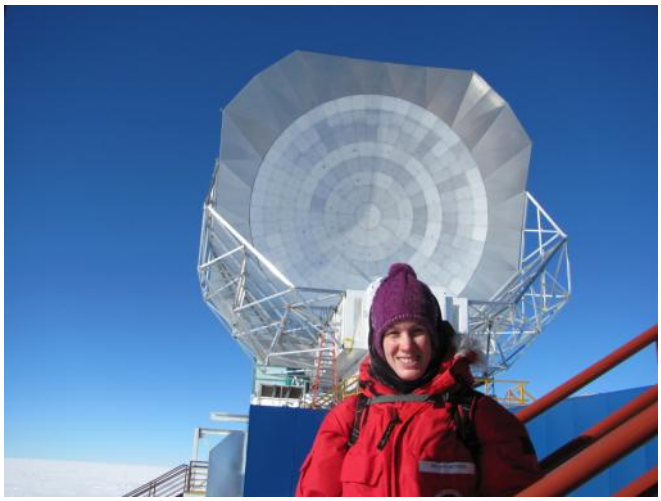
Did a skeleton lose one of its leg bones on Mars? Nope! It's just an image of a Martian rock. NASA's Curiosity rover captured this image. The rock was probably shaped to look this way over time by wind or water. If life ever existed on Mars, scientists expect that it would be small organisms called microbes. So, it isn't likely that we'll ever find a large fossil on Mars!

Credit: NASA/JPL-CALTECH/MSSS

Extreme Astrophysics: Life at the World's Remotest Telescopes, Part 2

by *Adam Hadhazy* of the Kavli Foundation

From oxygen-thin mountaintops to barren deserts to the South Pole, many of the world's most powerful telescopes are in distant, inhospitable environments. Three researchers share their adventures pursuing science at the farthest corners of the world.



This is the second of three excepts from a newsletter of the Kavli Foundation, and is an edited transcript of a roundtable discussion with three researchers who have taken their love for science to the ends of the Earth. It was too long to fit in one single article, so I've cut it into three pieces. The second participant is Amy Bender – a physicist associated with the Argonne National Laboratory and the Kavli Institute for Cosmological Physics (KICP) at the University of Chicago. Her specialty is designing instruments for observing the relic radiation from the Big Bang using the South Pole Telescope (pictured, in background) in Antarctica. She has journeyed to Antarctica, most recently for a three month -stretch from December 2016 to February 2017, to install upgraded instruments on the South Pole Telescope.

The **South Pole Telescope**'s 10-meter-wide dish captures the relic radiation of the Big Bang, known as the cosmic microwave background. This light contains clues about the universe's earliest moments as well as how the cosmos has evolved over its 13.8-billion-year history, under the sway of the mysterious phenomena, dark energy and dark matter. It is located at the Amundsen–Scott South Pole Station, Antarctica, a two-story building built on stilts so accumulating snow does not bury it. Even at the height of summer, when the sun never sets, the average temperature at the station is minus 15 degrees Fahrenheit (minus 26 degrees Celsius). The elevation is 9,500 feet (2,900 m) — about as high as Mount Olympus in Greece. The South Pole Telescope is a collaboration among more than a dozen institutions and is funded by the National Science Foundation.

Amy Bender is an assistant physicist at the Argonne National Laboratory and an associate fellow at the Kavli Institute for Cosmological Physics (KICP) at the University of Chicago. Her specialty is designing instruments for observing the relic radiation from the Big Bang using the South Pole Telescope (pictured, in background) in Antarctica.

THE KAVLI FOUNDATION: Did you have any Wizard-of-Oz-type, "We're not in Kansas anymore," moments, when the "otherness" of these new places hit you?

Amy Bender: Certainly, the very first time, it was special, getting off the plane, stepping onto the ice at the South Pole, looking around and thinking, "Wow, where am I?" Then you run off and go straight to work, so you don't really have time to contemplate that moment for too long. You fall into this routine of daily life. Then, walking down the station hallway, you suddenly look out the window and are reminded where you are. I guess you could describe those moments as very Wizard-of-Oz-like.

The South Pole is devoid of life except for what we've brought in ourselves. There are no plants. There are no animals. There are no insects. There is only snow in every direction, and a completely flat horizon. The best landscape we get is from the interaction of the wind with the snow. This builds up snow drifts around the buildings and also creates these very beautiful, windswept snow sculptures called "sastrugi."

I'll also mention about when you fly in to Antarctica, you look out the window and see giant ice floes in the water. Those become more and more tightly packed, and then eventually you see the snowy mountain edge of the continent. Those views of the coast are the most stunning of the trip.

***KF:** Amy, you're a veteran of Antarctica now. As a native Nebraskan, how does a Great Plains winter compare to the climate in Antarctica?*

Bender: It doesn't even come close! A Great Plains winter can be severe, but it has breaks for days where it warms up and the snow melts. That doesn't happen at the South Pole. You have this continuous, chilling cold.

***TKF:** What drew you to doing science at the South Pole in the first place?*

Bender: I never thought I would end up at the South Pole. I originally was studying something completely different in graduate school but ended up deciding that I wanted to work on scientific instrumentation. That led to joining the South Pole Telescope as a post-doc.

***TKF**: Let's talk about the preparation, physically or mentally, that goes into deploying so far away from home.*

Bender: We don't do any physical training, though perhaps we should, because the combination of the South Pole's extreme cold and altitude can pack quite a punch. We do undergo an extensive physical examination to ensure we won't have any problems while we're down there, because access to medical care is extremely limited.

The biggest challenge is really going through all the scenarios and anticipating everything you might need to complete your work down there. Because when you're at the South Pole, you can't just run to the hardware store and buy a new screwdriver. You have to bring it with you. For example, this year we needed to repair the cryogenic refrigerator system. The part we needed was completely custom, but fortunately we had a spare someone had brought down in their luggage, so we were able to make the repair.

***TKF:** So once you're adjusted, what's it like working and living in these extreme locations? I presume outdoor barbeques were not an option at the South Pole, Amy?*

Bender: There is very little time to be bored. We have a maximum of three months to do all of our maintenance, retrofitting and everything else, and then to get out.

But there is downtime. And, in fact, we do have outdoor barbeques! We play sports outside, such as ultimate frisbee. There are people that run a South Pole marathon every year. Certainly, you have to dress appropriately for it. Wearing 20 pounds of extra clothing slows everyone down.

There are about 150 people in the summertime, so there are large, group activities. We'll have open mic night, for example, or board game night, or volleyball, basketball or badminton games in the gym. My favorite is open mic night, because it's pretty amazing all the talent that comes out of the woodwork. But me, I don't sing. I sit in the back and listen and enjoy the show. [Laughs]

***TKF:** What were your living quarters like?*

Bender: Housing in the South Pole Station is like a very small dorm room, but you have one to yourself! There's just enough room for a twin bed and desk. They're nice and warm, and always quiet since people are always trying to sleep. Everything is fairly new, as the current station was only completed a few years ago. On the negative side, though, we only get very short showers twice a week.

TKF: Amy, you also had to deal with a never-setting sun on your trips during Antarctic summer. What was that like?

Bender: It's strange how quickly you get used to it. You end up associating times of day with where the sun is in the sky. In my room, I always keep the shade drawn, and put up a piece of cardboard to make it really dark. That way, when it's time to sleep my body is less confused. Going back to New Zealand, where we go when we leave the Pole, and watching the sun set again for the first time — that's always special.

TKF: Do any of you have plans to go back to the "ends of the Earth" for astrophysics, and if so, anything you would do differently this time?

Bender: I'll be heading back at the beginning of November. I have to keep in mind that every year the work we do down there is different, so I have to stay flexible and be prepared.

TKF: And maybe this time pick up a keepsake?

Bender: There is, in fact, a store at the South Pole research station, so I have quite a few sweaters with "South Pole Station" written on them. Also, once you've spent enough time in Antarctica, the U.S. government sends you a medal, which is kind of fun.

Next Mars Rover Will Have 23 'Eyes' from JPL

When NASA's Mars Pathfinder touched down in 1997, it had five cameras: two on a mast that popped up from the lander, and three on NASA's first rover, Sojourner.

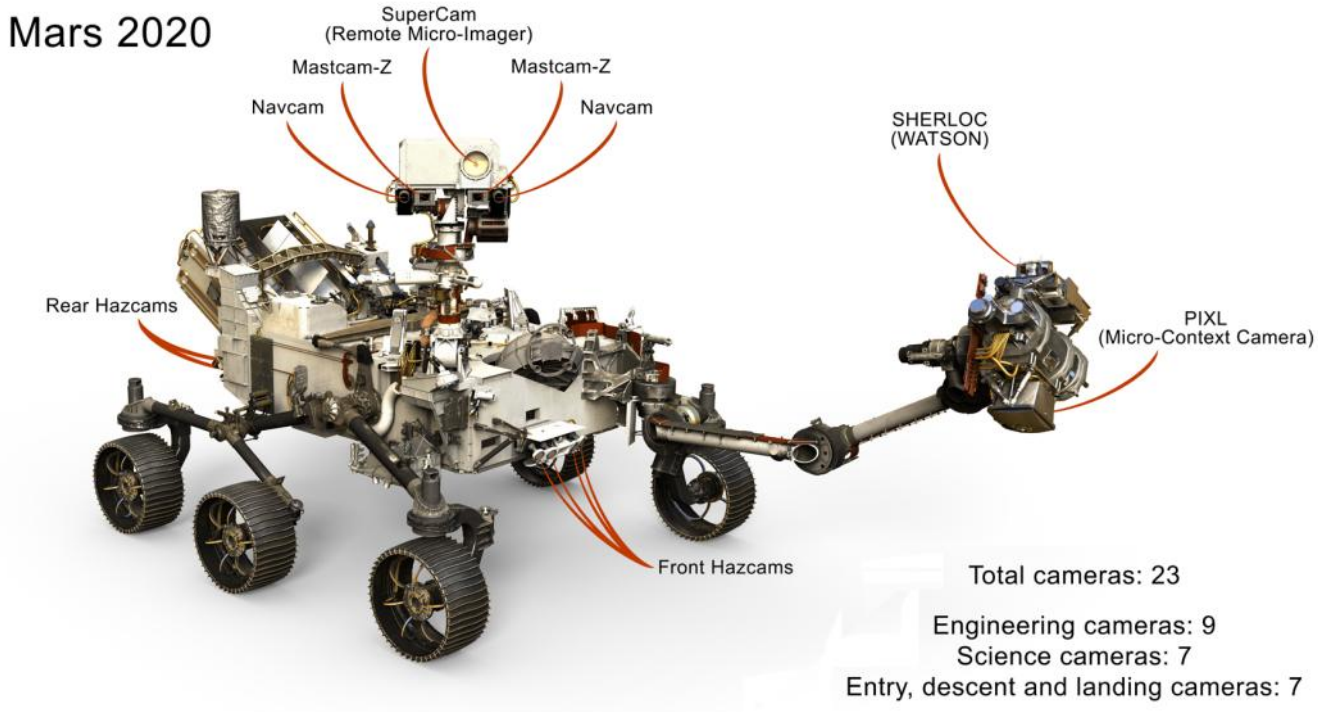
Since then, camera technology has taken a quantum leap. Photo sensors that were improved by the space program have become commercially ubiquitous. Cameras have shrunk in size, increased in quality and are now carried in every cellphone and laptop.

That same evolution has returned to space. NASA's Mars 2020 mission will have more "eyes" than any rover before it: a grand total of 23, to create sweeping panoramas, reveal obstacles, study the atmosphere, and assist science instruments. They will provide dramatic views during the rover's descent to Mars and be the first to capture images of a parachute as it opens on another planet. There will even be a camera inside the rover's body, which will study samples as they're stored and left on the surface for collection by a future mission.

All these cameras will be incorporated as the Mars 2020 rover is built at NASA's Jet Propulsion Laboratory in Pasadena, California. They represent a steady progression since Pathfinder: after that mission, the Spirit and Opportunity rovers were designed with 10 cameras each, including on their landers; Mars Science Laboratory's Curiosity rover has 17.

"Camera technology keeps improving," said Justin Maki of JPL, Mars 2020's imaging scientist and deputy principal investigator of the Mastcam-Z instrument. "Each successive mission is able to utilize these improvements, with better performance and lower cost."

That advantage represents a full circle of development, from NASA to the private sector and back. In the 1980s, JPL developed active-pixel sensors that used less power than earlier digital camera technology. These sensors were later commercialized by the Photobit Corporation, founded by former JPL researcher Eric Fossum, now at Dartmouth College, Hanover, New Hampshire.



20/20 Vision
The cameras on 2020 will include more color and 3-D imaging than on Curiosity, said Jim Bell of Arizona State University, Tempe, principal investigator for 2020's Mastcam-Z. The "Z" stands for "zoom," which will be added to an improved version of Curiosity's high-definition Mastcam, the rover's main eyes.

Mastcam-Z's stereoscopic cameras can support more 3-D images, which are ideal for examining geologic features and scouting potential samples from long distances away. Features like erosion and soil textures can be spotted at the length of a soccer field. Documenting details like these is important: They could reveal geologic clues and serve as "field notes" to contextualize samples for future scientists.

"Routinely using 3-D images at high resolution could pay off in a big way," Bell said. "They're useful for both long-range and near-field science targets."

Finally, in color
The Spirit, Opportunity and Curiosity rovers were all designed with engineering cameras for planning drives (Navcams) and avoiding hazards (Hazcams). These produced 1-megapixel images in black and white.

On the new rover, the engineering cameras have been upgraded to acquire high-resolution, 20-megapixel color images.

Their lenses will also have a wider field of view. That's critical for the 2020 mission, which will try to maximize the time spent doing science and collecting samples.

"Our previous Navcams would snap multiple pictures and stitch them together," said Colin McKinney of JPL, product delivery manager for the new engineering cameras. "With the wider field of view, we get the same perspective in one shot."

That means less time spent panning, snapping pictures and stitching. The cameras are also able to reduce motion blur, so they can take photos while the rover is on the move.

A Data Link to Mars
There's a challenge in all this upgrading: It means beaming more data through space.

"The limiting factor in most imaging systems is the telecommunications link," Maki said. "Cameras are capable of acquiring much more data than can be sent back to Earth."

To address that problem, rover cameras have gotten "smarter" over time - especially regarding compression.

On Spirit and Opportunity, the compression was done using the onboard computer; on Curiosity, much of it was done using electronics built into the camera. That allows for more 3-D imaging, color, and even high-speed video.

NASA has also gotten better at using orbiting spacecraft as data relays. That concept was pioneered for rover missions with Spirit and Opportunity. The idea of using relays started as an experiment with NASA's Mars Odyssey orbiter, Bell said.

"We were expecting to do that mission on just tens of megabits each Mars day, or sol," he said. "When we got that first Odyssey overflight, and we had about 100 megabits per sol, we realized it was a whole new ballgame."

NASA plans to use existing spacecraft already in orbit at Mars - the Mars Reconnaissance Orbiter, MAVEN, and the European Space Agency's Trace Gas Orbiter - as relays for the Mars 2020 mission, which will support the cameras during the rover's first two years.

The story behind viral, iconic Smith Rock total solar eclipse photo By Rob Davis, The Oregonian

A photographer traveling cross-country in a van captured what may be the most iconic and viral image of 2017's total solar eclipse in a carefully choreographed effort that left no margin for error.

Ted Hesser, a 31-year-old freelance photographer from the Bay Area, scouted locations at Smith Rock State Park in Central Oregon with his girlfriend, Martina Tibell, for a week. The two rock climbing enthusiasts spent days trying different climbing routes alongside other adventure photographers who all descended on the park looking for the perfect angle during totality.

Nothing seemed right until a day before the eclipse, Hesser said. At 10:19 a.m., about a minute before what would be totality, Hesser watched the sun crest the top right corner of Monkey Face, a well-known but challenging 350-foot-tall tower above the Crooked River.
"I knew: That's it. That's amazing," Hesser said.

Hesser had wanted to make an image like it from the moment he heard about the eclipse months ago. "As a photographer, one of the first thoughts was how do I capture something unique?" Hesser said. "Immediately my mind went to having a person in the frame in some environmental context, mixing the landscape with the event."

He thought about photographing the eclipse in his parents' hometown of Jackson Hole, Wyoming. But he didn't think that would work - the eclipse would happen too high in the sky for him to capture a silhouette. (Totality happened there at 11:35 a.m.)
Tibell and another friend, Tommy Smith, spent the rest of eclipse eve climbing and positioning Smith - the photograph's subject - in a way that Hesser thought would accentuate what he called the moment's mysticism.

But after the trio awoke at 3:30 a.m. on eclipse day and drove from their nearby campground to get a jump on their climbing preparations, they found the park's gate locked and guarded. Every minute was precious. Tibell and Smith were anxious to climb. They were finally let in at 5:30 a.m. and began ascending at 7.

A duo in front of them moved unexpectedly slow but eventually yielded. Tibell and Smith reached their destination at 9 a.m., with just a few minutes to spare before the eclipse began. Smith soon moved into position.As the partial eclipse disappeared behind the rock tower, Hesser got nervous. What if the sun's position in the sky had shifted too much in the day that passed since he'd scouted the spot?

Just before totality, the sun popped out from behind Monkey Face, and Smith and his gear were encased in an ethereal glow as what's called the diamond ring effect took hold. (It's the instant before totality, when the eclipse looks like a glistening diamond ring.)
"It happened perfectly," Hesser said. "I was on adrenaline. I couldn't at that moment believe it had so perfectly lined up."

Hesser said he shot about 15 frames, but none were as good. Thirty seconds later, Hesser said the total eclipse was too dark to capture the silhouette he'd envisioned. An outtake shows the sun and moon morphing into what looks like a three-legged celestial orb.
The iconic photo began going viral shortly after Hesser posted it on his Instagram account (55,762 likes) and his Facebook page(77,000 shares and 62,000 likes). Hesser said he has gained 13,000 Instagram followers in the last day.

By Tuesday, Hesser and Tibell were bound for Hood River, while fending off allegations that Hesser faked the picture. Despite having to contend with skeptics, Hesser was reveling in the widespread attention the image had earned. (He doesn't have a plan yet for the next total solar eclipse in the United States in 2024.)

"It was just exhilarating," he said. "I'd thought a fair amount ahead of time of the concept of the eclipse, how crazy it is for anyone along its path to be looking at the same thing and doing the same thing for how scattered the direction of our lives is. To be singularly focused on a natural phenomenon is kind of wild."

An outtake from Ted Hesser's photographs at Smith Rock State Park during the 2017 total solar eclipse shows how little margin for error he had. This frame was made about 30 seconds after an image that went viral.

The telescope that ran over a car from astroanecdotes.com

It is well known that cars are often involved in accidents, either by crashing into something, running over things, slipping off the roads and similar nasty business. This is also true in astronomy, where accidents do happen from time to time. What is different though, is that while cars can run into things almost everywhere, having something running over your car is a much rarer experience.

Meet the Nordic Optical Telescope (NOT): A nice, 2.5m telescope of a somewhat peculiar design. Whereas all telescopes have some sort of turning dome, that allows the telescope to point to many different parts of the sky, the NOT is constructed in such a way that not only the dome, but the entire telescope building turns, when you want to aim your telescope at a different patch of sky. This of course involved some engineering challenges, like, plumbing (there's no bathroom in the telescope), as well as an entry staircase that is attached to the telescope. Which, amongst other things, means that you never really know what direction you are facing when you leave the telescope.

One day, the day-time crew were in need of hoisting equipment into the telescope dome, from the observatory pickup. For the crane to be able to reach the equipment, it needs to be positioned right at the wall of the telescope building. Thus, the pick-up was backed up, really close to the telescope, to make it easier to get the equipment in. This being an everyday operation, the crew unloaded the pickup, closed the dome, and proceeded with whatever they were doing.

Shortly after, someone decided that the telescope should be put in the parking position, so it was ready for the night to come. A sensible thing to do, except that no one had checked if the pickup had been moved away from the building. Thus, as the building turned, the entry staircase rammed into the side of the pickup, with the telescope effectively running over the car. Fortunately, the impact cut the wires to the safety system, which happened to run along the staircase, forcing the telescope to an emergency stop. Had this not happened, the telescope building could have been severely damaged, and the pickup as well.

The damages were luckily so small that the pickup could drive out of there, and at the time of writing, is still being used at the telescope. This is also one of the times where it really pays off to pay attention to the warning sign outside the telescope building.

October 2017 Monthly Meeting by Ed Mizzi

On Oct. 5, 2017, the Hamilton Centre met for its regular monthly meeting. Attendance was very good with about 30 people present and everyone was excited about the election and eclipse stories.

Gary Bennett began the proceedings with a welcome to everyone, especially new members and visitors.
He announced that this was our Annual General Meeting at which time we elect a new Board of Directors. In addition, we would hear members' accounts of their solar eclipse experiences.

Gary introduced Bob Prociuk, Board member, whose portfolio includes memberships. Bob discussed the benefits of being a member of both the Hamilton Centre and the Royal Astronomical Society of Canada. He displayed a screen slide with the names of the newest members, including Keith Allman, Doug Legge, Barbara McCoy, Christine Whitlock and the Yurichuk Family (Alexandra, Jason, Robert). Welcome!

Then Ed Mizzi discussed outreach and also encouraged members to participate in these fun and enjoyable activities with the public. He displayed photos of the Moon taken by Erin Vassair using a smart phone and her telescope, which she also used at an event in July. He listed several events that occurred over the past year, especially the most recent events, including the July 29 Sidewalk Astronomy session at Spencer Smith Park in Burlington, where Gary Bennett, Roger Hill, Bob Prociuk, Erin Vassair, Martin Palenik and Ed Mizzi wowed passersby with views of the Sun, Saturn, Jupiter and the Moon, Bob Prociuk's solar eclipse event on Aug. 21, a visit to the St. George Library by Ron Shields, Bob Prociuk and Ed Mizzi and the first ever corporate event, at L3 WESCAM in Burlington, where Ron Shields, Troy McCoy and Ed Mizzi wowed 50 – 60 engineers with views of the Moon, Saturn and other heavenly bodies. Hopefully 2017/2018 will see similar fun events, with more members participating.

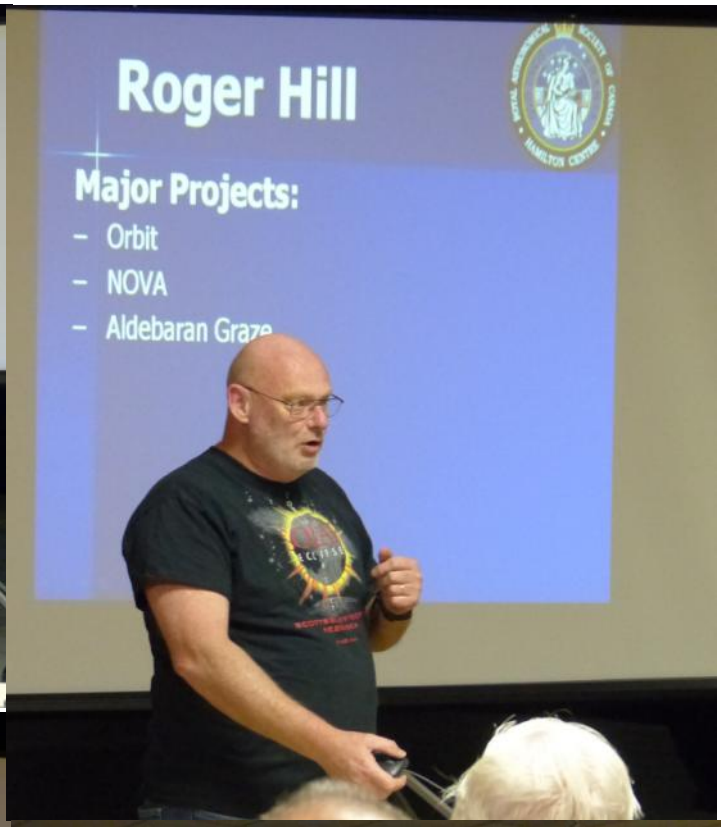
Next, Gary Bennett did his thank you and goodbye speech as he stepped down as president to allow for someone new to take the reins. Gary thanked each and every Board member, highlighting each of their skills and contributions to the club. He talked about the many achievements the club has made over the past two years, as well as work that still has to be accomplished and challenges we face in the near and distant future. Andy Blanchard arose to thank Gary, on behalf of the entire club, for his dedication and commitment to the Hamilton Centre. And of course, Gary offered to continue as a Board member, helping the club grow in any way that he could. Thanks Gary!!!

Roger Hill was invited to take the floor to walk us through and proceed with the election. Roger explained the procedure and after the Board members were officially declared, all 9 of them left the room to discuss portfolios. They returned to announce the four designated positions, Secretary Chris Talpas, Treasurer Bill Leggett, Vice President Bob Prociuk and President Ed Mizzi. Another 3 directors were added at that time. It was announced that the first Board of Directors meeting would occur at 8 PM on Wednesday, Nov. 8, at the Observatory. All club members are welcome to attend.

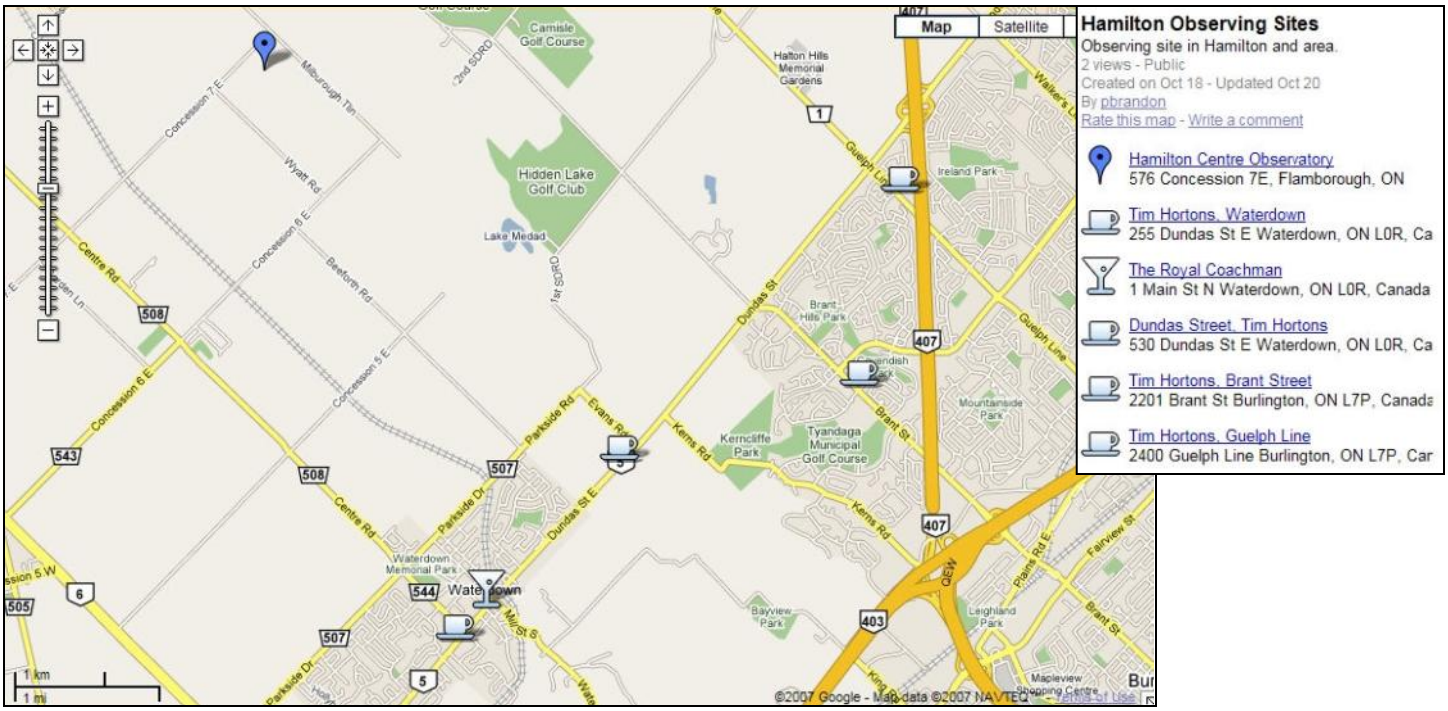
After a short break, Gary introduced those with solar eclipse stories, including Ed Mizzi, Muhammad Basil Ahmad and Colin Haig. Each experience was different, yet they all exuded a sense of happiness and excitement that they had travelled great distances but that it was well worth the trips.

Next meeting…Thursday, November 2, 2017 at 8:00 PM. Royal Canadian Legion Hall, Waterdown.


Welcome New Members
Keith Allman
Doug Legge
Barbara McCoy
Christine Whitlock
Yurichuk Family
Alexandra Yurichuk
Jason Yurichuk
Robert Yurichuk


Roger Hill
Major Projects:
Orbit
NOVA
Aldebaran Graze


Presidents Message
Gary Colwell
Dino DiSabatino
Roger Hill
Bill Leggitt
Ed Mizzi
Bob Prociuk
David Surette
Chris Talpas



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Vice President	Bob Prociuk	Councillor	Andy Blanchard
Secretary	Chris Talpas	Councillor	Ron Shields
Treasurer	Bill Leggit	Councillor	Eric Golding
Past President	Gary Bennett	Councillor	Muhammad.Ahmad
Orbit Editor	Roger Hill	Councillor	Troy McCoy

The front and back cover pictures came from Erin Vassair, who used her Android phone, a 26 mm eyepiece and her Infinity 102 telescope, FL 600 (f5.9)

Ed Mizzi wrote and said “I love highlighting things like this because it may encourage other members, it shows what can be done with very little equipment and it brags about members getting involved. Erin was also at the July 29 Sidewalk Astronomy event and in the short time she was there, we taught her how to use the scope and she ended up with a line-up of people at her station...wow!”

I have to echo Ed’s comments. I set up next to Erin that night and noticed how she handled the people who looked through her telescope...you’d think she was a veteran!

I should also note that the Centre has two Universal Smartphone eyepiece adapters from iOptron. We use these at sidewalk astronomy events, and they’re particularly good for lunar photos.

Erin will be using one for November, and I hope we’ll get to see more of her work.