

NOVA

NEWSLETTER OF THE VANCOUVER CENTRE RASC
VOLUME 2022 ISSUE 6 NOVEMBER DECEMBER 2022



Meet the Borg: Or notes on the AOMO Observatory

by Michael Levy

The sacrifices I make for this club. I have just finished watching an episode of *Star Trek: Voyager* (Season 7, Episode 2, “Imperfection”). I watched this because it contains a wonderful scene that comes to my mind whenever I think about our current president Alan Jones and his drive to revive the AOMO Observatory.

In the *Voyager* episode, the young former Borg, Icheb, who has a giant teenage crush on Seven of Nine, is trying to donate his cortical implant in order to save her. At first she refuses. When the doctor and her are talking, Icheb’s voice comes over the intercom:

Icheb: “Icheb to the Doctor. Report to Cargo Bay 2 immediately.”
Seven of Nine: “He’s persistent.”

The Doctor: “Not to worry. I’ll make it clear to him that *persistence is futile*.”



The new, revitalized AOMO Observatory

A wonderful play on the usual Borg message: “We are the Borg. You will be assimilated. Resistance is futile.”

Clearly, this is not something that Alan took to heart. His incredible persistence has been anything but

futile.

The AOMO observatory is located in UBC’s Malcolm Knapp demonstration forest, just north of Maple Ridge.

The UBC web page for the forest says this:

“Located in Maple Ridge, bordering Golden Ears Provincial Park, the UBC Malcolm Knapp Research Forest (MKRF) was established by a Crown Grant to the University of British Columbia in 1949, as a facility for research, demonstration,

and education in the field of forestry and allied sciences. This 5,157 hectare “working” forest boasts more than 200km of trails and roads for walking and hiking. MKRF’s lands are being managed to conserve and protect fish, water, soil, wildlife,

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NOVEMBER 10 SFU/Zoom
RASC National Past-President, Chris Gainor, on Canada’s contributions to astronomy and spaceflight. Room WMC 3260 and on Zoom. **SFU**

DECEMBER 8 SFU/Zoom
AGM, followed by a short lecture. See Meetup for room location and Zoom details. **SFU**

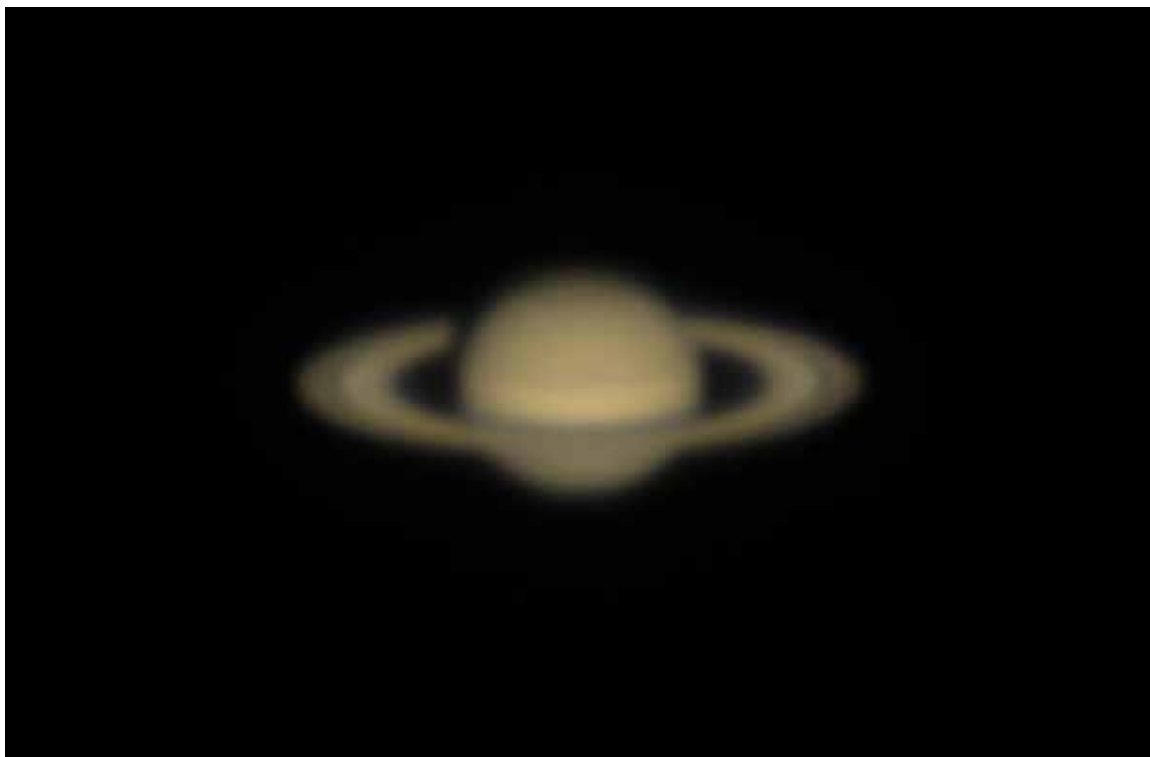
JANUARY 12 SFU/Zoom
Speaker TBA. Watch Meetup for updates and SFU room location. **SFU**

Members' Gallery

Jupiter and Saturn

by Rob Lyons

Imaged from the Trottier Observatory on September 27th, 2022. The picture of Jupiter also captures Ganymede, just below and to the right of its shadow.



President's Message

by Alan Jones

What inspires us all about RASC-Vancouver as we draw to a close of 2022? Our club accomplished a great deal in a year that started with us huddled in our homes trying to not spread or catch Covid-19. We gradually transitioned back to in-person events. Council led our participation in 22 events this year. We also hosted ten monthly meetings with

presenters on interesting astronomy or related topics. In the second half of the year, these meetings are offered in-person at SFU with a virtual Zoom option. My thanks to Andrew Ferreira for finding and scheduling so many excellent presenters.

During the last two weekends in October, sixteen members of our club volunteered to present talks and

lead night sky observing sessions for Manning Park Resort's two Dark Sky weekends. More than half of those volunteers are from your council. It was a great event to round off the year with time to meet new people and opportunity for everyone to learn from each other and share our enjoyment of learning about astron-

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About RASC

The RASC Vancouver Centre meets at 7:30 PM on the second Thursday of every month at SFU's Burnaby campus (see map on page 4). Guests are always welcome. In addition, the Centre has an observing site where star parties are regularly scheduled.

Membership is currently \$104.00 per year (\$61.10 for persons under 21 years of age; family memberships also available) and can be obtained online, at a meeting, or by writing

to the Treasurer at the address below. Annual membership includes the invaluable Observer's Handbook, six issues of the RASC Journal, and, of course, access to all of the club events and projects.

For more information regarding the Centre and its activities, please contact our P.R. Director.

NOVA, the newsletter of the Vancouver Centre, RASC, is published on odd-numbered months. Opinions expressed herein are not nec-

essarily those of the Vancouver Centre.

Material on any aspect of astronomy should be e-mailed to the editor or mailed to the address below.

Remember, you are always welcome to attend meetings of Council, held on the first Thursday of every month at 7:30pm in the Trotter Studio in the Chemistry wing of the Shrum Science Centre at SFU. Please contact a council member for directions.

2022 Vancouver Centre Officers

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At Large Douglas Filipenko, Shay Pomeroy,
Michael Levy
Honourary President J. Karl Miller

Library

The centre has a large library of books, magazines and old NOVAs for your enjoyment. Please take advantage of this club service and visit often to check out the new purchases. Suggestions for future library acquisitions are appreciated.

On the Internet

rasc-vancouver.com
astronomy.meetup.com/131/
www.facebook.com/RASC.Van
www.instagram.com/rascvancouver/



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Mailing Address

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Map to Meeting Site



Our December meeting is in room WMC 3260 of the West Mall Centre, at the west end of campus as indicated by the arrow on the map.

The meeting will also be livestreamed on Zoom.

Pay parking is available at several locations located around campus (indicated as "P" on the map).

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omy. We gained new members as a result of the events.

Weekend #1 was Beginner weekend complete with Bill Burnyeat and his mobile planetarium. I attended Manning weekend #2 Intermediate/Advanced and was involved in the planning. It was great to see the high engagement of the attendees. All sessions were well attended and had excellent questions posed. We planned ample time for interaction between presentations. The presentations were excellent and hit the mark to Inspire and Inform our audiences in both Visual and Astrophotography. Well done to all. Friday night's observing session was cloudy with sucker hole sky openings for a very enthusiastic group in spite of poor conditions. Maybe better luck next time. Thank-you to volunteers: Leigh Cummings, Suzanna Nagy, Andrew Ferreira, Marla Daskis, Jennifer Kirkey, Meredith Miller, Martin Curic, Tianna Sequeira, Robert Conrad, Rob Lyons, Rick Schneider, Rouzbeh Bidshahri and Ted Stroman.

We finish the year with our observatory in Maple Ridge in the final stages of recommissioning. This is the culmination of several years of effort and council support which included replacing the dome, the roof, extensive interior cleanup and painting, widened forest clearing and installation of first-class observatory equipment donated to our club as noted in previous messages. See Michael Levy's article for more details of this incredible project and a now usable asset of our club of which we can be proud. I am excited to see what we can do with this facility back in operation. The UBC Malcolm Knapp Forest management is also keen to partner with us in inspiring their environmental program students about astronomy. We are looking forward to our members capturing image data and learning to process the data into images we can post on our website and share with membership and the public. More information will follow as we catch our breath from the work on the observatory and transition to the work

of making it accessible to interested members and to planning outreach events for members and the public. A huge thank-you to Carl Bandura for the incredible dedication to bringing us to this happy moment. Also thanks to Rick Schneider, Marla and Ron Daskis for their stellar contribution to this effort over the past year. Many others have helped get us to the finish line.

As we near the end of the year 2022 I would like to thank the members of council for their wisdom, cheerfulness, dedication to our club and their support this year. I thank all members for your support and wish you all well as we head into cold, wet-coast winter. Solstice is only a few weeks away when the days lengthen again and we head back to warmer weather for visual astronomy. In the meantime, enjoy the winter constellations when we get a rare clear night. Members with a telescope please consider brining it to clear Friday nights at SFU and share with a very enthusiastic group of enthusiasts.

– Alan ★

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biodiversity, community values and traditional native uses. The focus at MKRF is the responsible use of resources to ensure sustainability. Specific sections of the forest are harvested and replanted and have

observatory in around 2006. At that time, it housed a 16-inch Meade Schmidt Cassegrain Telescope, fitted with a Fingerlakes CCD camera. Wayne Lyons was in charge. The observatory was used frequently, both for visual observing and astro-

the building without power.

Unfortunately (and more on this later), there is no specific budget for the observatory. It relies almost completely on volunteer help, and so, sadly, the AOMO observatory became unusable.

In early 2014, Alan decided that it was worthwhile restoring the observatory. He admitted during the interview that, at the time, he did not realize what a huge undertaking this was. But thanks to his not futile diligence, plus the help of an army of helpers, the observatory will soon be going again. His actual words, when facing this mountain of problems, were:

“You just have to suck it up and keep focused on the joy we will have at the end, rather than the drudgery of the task at hand.”

The path, however, has not all been drudgery. Howard Trottier, like other members of council, has been an observer of the progress of the AOMO restoration project and

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Carl Bandura & Alan Jones, Co-chairs of the observatory committee

been since the forest was granted to UBC in 1949.”

Last week, I interviewed Carl Bandura and Alan Jones, co-chairs of our observatory committee, for the purpose of this article.

Alan first became aware of the

problems with the observatory started developing around 2014. Trees around the site encroached and grew taller. The electronics of the mount started acting up. The dome and the building developed a leak, and UBC redirected their power lines, leaving

photography. Wayne passed the reigns of managing the observatory to Leigh Cummings. People continued to meet there, and Leigh kept a diligent log of the observatory activities.

Sadly, prob-

Membership has its Privileges!

Are you tired of looking at the same objects again and again (planets, moon, etc.)? Is your telescope collecting dust because it's hard to locate deep sky objects? Would you like to bring your observing to a stellar level? Robert Conrad, our new observing director, revived the Vancouver RASC observing group and invites you to join by sending him an email at observing@rasc-vancouver.com. Some of the benefits of belonging to this group include:

- Hands on training on how to operate the SFU Trottier observatory
- Weekly observing sessions at the observatory or at dark sky locations
- One-on-one coaching on how to locate thousands of objects in the night sky
- Attend small interactive seminars delivered by Robert on a range of topics including failsafe star-hopping, charting challenging objects and understanding the motions of the cosmos
- Learn to make your telescope dance by locating objects such as asteroids, nova, and supernovae
- Spectroscopy and imaging training from Howard Trottier and an opportunity to collaborate on observatory research projects
- Updates on observable sky events happening during the week like asteroid/comet/deep sky conjunctions
- Access to observing guides and lists that Robert created that took hundreds of hours to create and will help with planning observing sessions
- Knowledge and expertise from other observing group members
- Learn how to quickly and efficiently find and star-hop to deep sky objects using a range of binoculars and telescopes

Upcoming Events

December
12 – AGM

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visited on several occasions. He and his wife Loula have gifted the club with a fantastic telescope, mount and imaging system. (Specifically, a

Carl was modest about his role during the interview, but afterwards, Alan told me “Many people helped but none like Carl. Carl owned this project and drove it to the finish

line. We would not be here without his involvement.”

Alan Jones is retired with an IT and business background. He told me that he always had a deep curiosity for science and he says that he finds creative

faced (and overcame):

- Mould
- Leaks
- Rotten beams
- Relocating the mount pier—the old mount was Alt-Az, but the new one is German Equatorial, so the new pier had to be centralized. A significant challenge was making sure that the (massive) pier was correctly North-South aligned, because there is limited adjustment for this alignment on the mount. Even finding the buildings alignment was a challenge.



Installation of the new pier for the mount and telescope was a major challenge

Planewave CDK 17 and Paramount ME mount. I am not sure what camera is included). This was a crucial step in the process, and we all owe the Trottier family a huge thank you.

Alan has had help in this project from many other people, too (he estimates around 50), but in particular, Carl Bandura responded to one of Alan's call-outs, and injected expertise and energy into the project.

Carl has been interested in astronomy from his university days in Saskatoon. He graduated in electrical engineering, and is now retired after many years with Transport Canada as a senior engineer. He has been using telescopes for about 10 years.

thinking to solve puzzles in different ways rewarding. He also really enjoys working with interesting people.

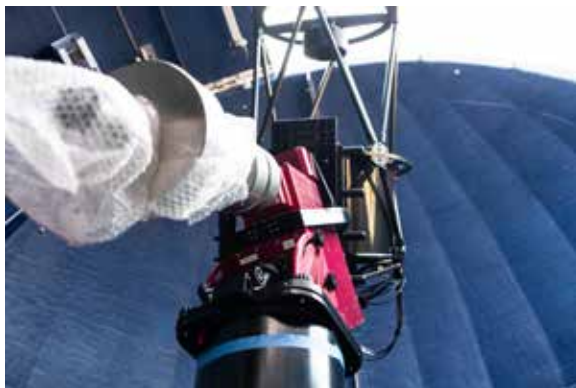
We have to also thank Wayne Lyons for inviting Alan to the observatory, and getting him involved in using the telescope. Back in those days, Wayne met up with interested members every Wednesday night, cloudy or not. People earned their time by helping with various chores, and in return Wayne mentored them in using the equipment.

During my interview with Alan and Carl, I asked them to describe the biggest challenges they faced. Alan's immediate response was, “Which ones?” so we tried to narrow it down to a top five.

Here are some of the issues they

Alan had an interesting story about trying to fix the problems with the old mount. Here is the story, in Alan's words, talking about the help from Dan Collier, who was an Electrical Engineer who maintained the Vancouver planetarium.

“He came out with Mark Eburne one night, and I took my recording oscilloscope ... and we captured the start up sequence from the old mount. And you could see the ones and zeros on the oscilloscope—captured! I was completely blown away. I had never seen anything like this before. So the scope had a Motorola 8088 chip and Dan interrogated the pins on the chip and he knew by heart which pin was the out pin. So we probed this thing and fixed some of the problems with the mount. I had never seen



The Planewave CDK 17 optical tube assembly mounted on a Paramount ME

anything at that level before. I was totally blown away.”

I then asked about the role of UBC who, after all, own the land. Carl told me that they arranged a meeting with the management of the forest. They came up and Alan and Carl explained the project, but also pointed out some of the difficulties, including the trees that were obscuring a lot of the sky. The UBC team were keen to help, and want to include the observatory in future programs for students. The agreed to do a clearing, and I am happy to report that the view of the sky are now good.

When I asked Carl what was left to do with respect to the mount and scope, he said that he still needs to do a precise alignment, but that will have to wait for good weather. Carl thinks we need a few nights of clear skies to finish this job.

Once it is done, the telescope will be configured with a camera, with the real-time view projected on a monitor which is housed in the room below the ‘scope.

Carl also points out that, because

of the clearing, interested members can bring their own telescopes up to the observatory and set them up on a concrete pad just outside of the building. Although there are still trees, Carl thinks that the eclipse

is visible now from that pad.

I asked Carl and Alan about power. They told me that the observatory is powered by a gas-powered generator, which provides sufficient power for the mount, the imaging system and the computer. It runs quietly in a small shed near to the main building.

On their wish list is a solar-powered system. This would have many advantages, and would be consistent with the UBC objective of demonstrating sustainability. It would also be wonderful to add internet connectivity so that members could operate the scope from their homes. There is, at present, no money avail-

able for these improvements.

So let’s talk about money. At the most recent council meeting, it was announced that an anonymous donor would gift \$1,500 towards the observatory if the council would match this. Council unanimously agreed, and the money will be used for some last minute improvements, especially for protecting the site and equipment.

The observatory is a wonderful asset for RASC Vancouver, and will help us enhance our outreach programs. But money will be of course an ongoing issue, so I encourage you, dear reader, to lend your support by donating if you can to this project. You will of course get a charitable receipt for your donation: RASC Vancouver is a Canadian registered charity. You can donate through Paypal or Canada Helps by following this link:

<https://rasc-vancouver.com/donations/>

If you donate through Canada Helps, you will get your receipt almost immediately.

I look forward to meeting you soon at the observatory. Clear skies. And remember Alan’s words of wisdom: Persistence is not futile. *



Council was invited to visit the site for an inspection in early October

Dark Sky Weekend at Manning Park Lodge

by Leigh Cummings

Once again, a hardy group of RASC volunteers, including yours truly, ventured up to Manning Park in support of their “Dark Sky Weekend.” Different this year was that they broke their event up into two weekends instead of one. I volunteered for the first weekend which

Daskis at the “Ask the Astronomer” table on the porch of the Alpine Room. The lodge was kind enough to set up propane heaters for Marla and myself to sit under and keep relatively warm. We were not exactly swamped on that first sitting, but we did get to chat with a few guests.



Renuka's talk on Saturday afternoon

was aimed at beginners and family groups. The weekend was on October 21 to the morning of the 23rd.

As you all know, the 21st was the first truly wet day we had experienced in three months. Thank goodness we astronomers are such an optimistic bunch as we all got together in our carpools and drove to Manning Park with cheerful disregard for the rain beating down upon us. I had picked up Suzanna Nagy in Pitt Meadows and proceeded over the Golden Ears Bridge to get to the freeway. Our drive to the lodge was quite uneventful and we made it in just around two hours despite the weather. The only snow we encountered was on the treetops at the top of Allison Pass.

After getting checked in at the lodge, I had an hour stint with Marla

a Star Wheel.” After that, Andrew Ferreira gave a very entertaining talk entitled, “A Hitchhiker’s Guide to Space Exploration”. Suzanna then gave a “teaser” about the Jim Bernath Meteorite Collection that was going to be on display the next day.

As Friday night continued to be wet, we pivoted to “Plan B” which was a well-received talk by Chris Gainor about the history of space telescopes. We followed that up with a fun trivia

quiz presented by our two newest volunteers, Martin Curic and Tianna Sequeira. Everybody really enjoyed the quiz, and it was heartening to see how well the young people in the crowd did. In fact the second place winner, (who is decades younger than me) got more right answers than I managed to get.

On Saturday afternoon, the guests were able to take in several talks by different speakers. This included Renuka Pompana, Suzanna, Marla and Chris. What turned out to be a very popular event was Bill Burnyear’s inflatable portable planetarium. Although I was too busy to make over to see for myself, a lot of guests asked me where to find him. We also set up another “Ask the Astronomer” table, this time populated with me, Marla and Jennifer Kirkey. Also across from us was a table set up by the Fraser Valley



Solar observing on Sunday morning

Library Association with a display of books and their loner telescopes. Beside them we had two tables of

the Jim Bernath Meteorite collection looked after by Suzanna, Andrew, Martin and Tianna. This was another big draw, and I heard lots



Children's activities on Saturday afternoon

of oohs and awes coming from that direction.

Not to be neglected, the young people had activities set up by the Manning Park staff in the Tamarack room. As well as face painting, they had tables of projects that the children (including some parents) could take part in, as well as a planet exploration toss to help burn off some energy. Our volunteers, Jennifer Kirkey and Meredith Miller, were a big part of that high-energy activity.

As we had a forecast of some clearing Saturday evening, the park staff decided to do a modified viewing evening. We travelled to the Lightning Lakes Day Area to set up telescopes in the hopes of getting in some observing for the guests. As it turned out, right on schedule, we started to spot stars here and there in what we astronomers affectionately call "sucker holes." We chased

around the sky trying our best to get a target before a hole would closed up. I managed to get Saturn in view long enough for a dozen or so guests

to get a look. Saturn is always an "Oh, wow" moment. After about an hour of chasing the "holes," it clouded over completely. I walked away from my telescope to chat with another volunteer when I heard a young voice yell out,

"It's snowing!" I didn't quite believe it at first, but when I got back to

my telescope, it already had a dusting of snow on it. I have to say, packing up because of a snow fall is a first for me.

We were in for a surprise Sunday morning when we woke up to a beautiful sun shining on a wintry scene. It didn't snow much, but it was enough to make it pretty.

Right after we had breakfast, we set up the solar scopes (we didn't expect to use) and got to show the guests

our closest star before they headed to their vehicles for their journey home.

One last note: the food at the Pinewoods Restaurant is both delicious and the servings are "logging camp" in size. At my age, I found myself ordering the children's meals and still struggled to finish them off. Fortunately, the friendly staff boxed up leftovers for us to take to our rooms for late night snacks.

Even though the weather did not cooperate to the extent we would wish for, it was a fun weekend that we volunteers fully enjoyed. As LPA chair, it energizes my desire to try to turn down the lights wherever we can. In the light-polluted skies above us, you can tell it is cloudy at night when the sky is bright. In Manning Park you can tell it is cloudy when



More children's activities from Saturday

the sky is black and not star-lit.

We need the rain, but please let it fall on weekdays. ★

Watch Your Sky

For all I know, the dinosaurs did apparently not have much interest in looking at the sky. Also, they did not seem to have any capability that would have led them to plan ahead in detail. The major part of their activities likely were to hunt down other species for food. It was a successful life philosophy; dinosaurs were wide-spread on Earth for more than 200 million years. Among their hunted, there were some which fed milk to their offspring—the mammals. Because they were quite small, mammals would have been an easy target for the dinosaurs. Probably because they were under almost constant threats, mammal species evolved into various types, and because they were much threatened, many likely built their living quarters in protective places. They would have to have been acutely aware of their surroundings, both on the ground, and above and below. Anticipation of danger would have been an important characteristic. Altogether, mammals would have become very flexible, in order to stay alive.

These two different “philosophies of life” eventually cost the dinosaurs their existence, except for one or two who became the ancestors of our current species of birds. The mammals’ approach to living insured the survival of at least some primate-like mammalian species. The main cause for this turn of events was very likely the impact of an extremely large meteorite, which 66 million years ago or so caused world-wide destruction of plants and animals on land, in oceans and lakes, and also caused extreme changes in the atmosphere. The

Chicxulub crater, located on the Gulf of Mexico’s Yucatán peninsula, is believed to be the remnant of this catastrophic event.

Some primate species turned into the human line about 3 million or so years ago and today, we are spread around the world. Our “smarts” have increased to an amazing level (although I wonder sometimes, considering the current political conditions, and the disregard for past warnings of a major climate change ahead). The most impressive aspect for me is our capability to travel in space.

As a prime requisite, this requires technologies to obtain a very accurate knowledge of the effects of gravity, astronomical distances, ongoing precise measurements and observations, the mathematics to precisely calculate orbits, and intense observations of the space environment. If we want to avoid another Chicxulub, then among these ongoing activities is the necessity of looking out for large Near Earth Objects, whose orbit might lead them to a serious collision with the Earth. Fortunately, a fair number of organizations do this; NASA is leading the way. We also need to build up the capability to alter the orbit of any such threatening object, so that it will bypass us.

The first test to alter the orbit of an NEO has already been completed successfully. NASA put out a press release about its Double Asteroid Redirection Test, an attempt to hit the “moon” of NEO Didymos, called Dimorphos.

Here is an excerpt from the press release:

by J. Karl Miller

“All of us have a responsibility to protect our home planet. After all, it’s the only one we have,” said NASA Administrator Bill Nelson. “This mission shows that NASA is trying to be ready for whatever the universe throws at us. NASA has proven we are serious as a defender of the planet. This is a watershed moment for planetary defense and all of humanity, demonstrating commitment from NASA’s exceptional team and partners from around the world.”

Prior to DART’s impact, it took Dimorphos 11 hours and 55 minutes to orbit its larger parent asteroid, Didymos. Since DART’s intentional collision with Dimorphos on Sept. 26, astronomers have been using telescopes on Earth to measure how much that time has changed. Now, the investigation team has confirmed the spacecraft’s impact altered Dimorphos’ orbit around Didymos by 32 minutes, shortening the 11 hour and 55-minute orbit to 11 hours and 23 minutes. This measurement has a margin of uncertainty of approximately plus or minus 2 minutes.

Before its encounter, NASA had defined a minimum successful orbit period change of Dimorphos as change of 73 seconds or more. This early data show DART surpassed this minimum benchmark by more than 25 times.

One must call this a major achievement on the way to protect Earth from a catastrophe similar to which befell the dinosaurs. However, we can’t just consider the fate of our Earth. We have the benefit of a fairly dense atmosphere, which not only keeps us alive, but also does a pretty good job of protecting us from the meteors which hit

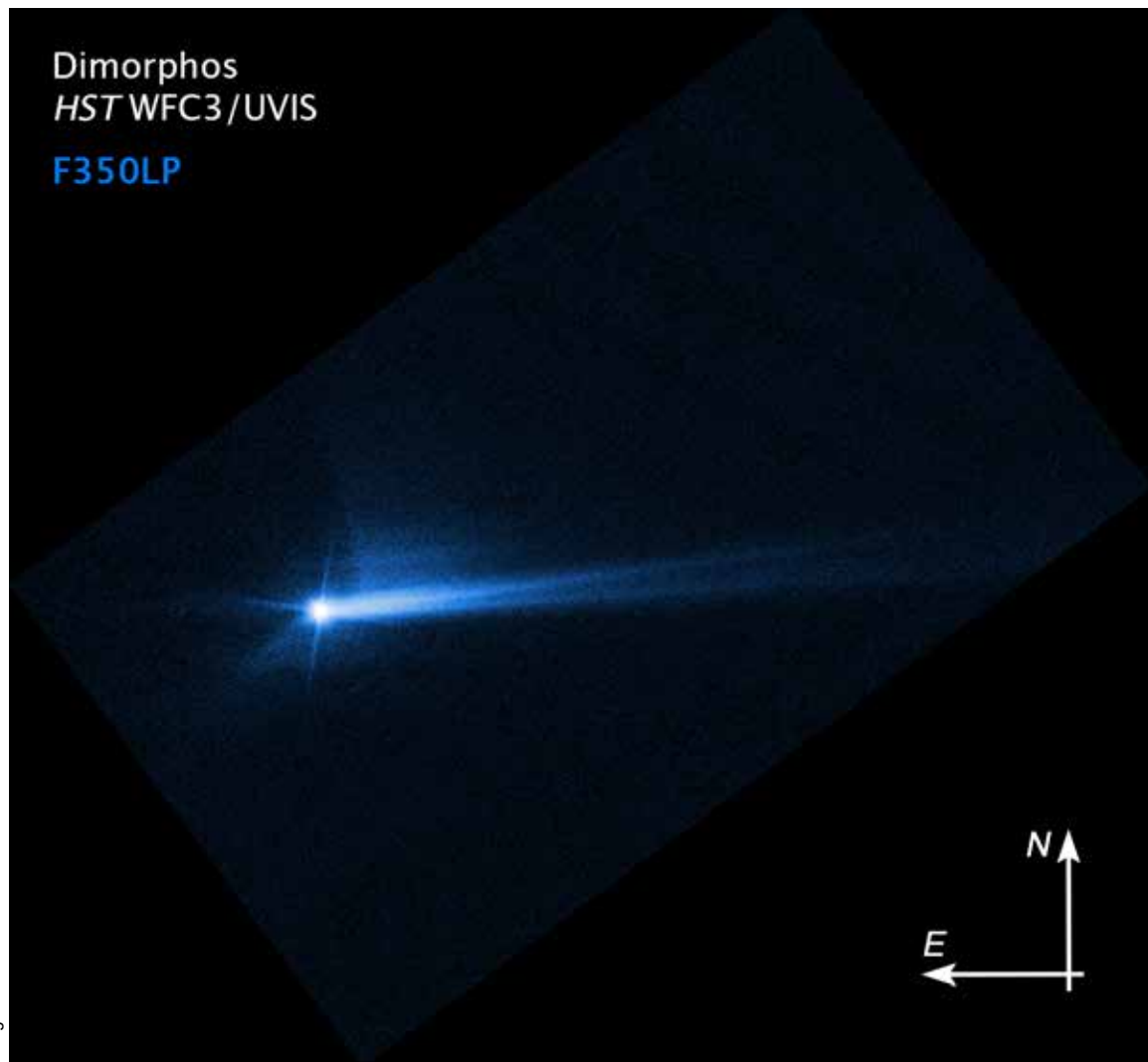
us every day and night. Those range in size from dust grains to small asteroids and burn up in the air because of their high speed (think of shooting stars and fireballs). Beyond a certain size they do not burn up: the bigger, the worse.

There are projects underway which propose human visits to, and settlements on, our Moon and also Mars. The threat of meteorite impacts exists for them just as much as it does for us. It is danger enough; but another threat exists pursuing these plans:

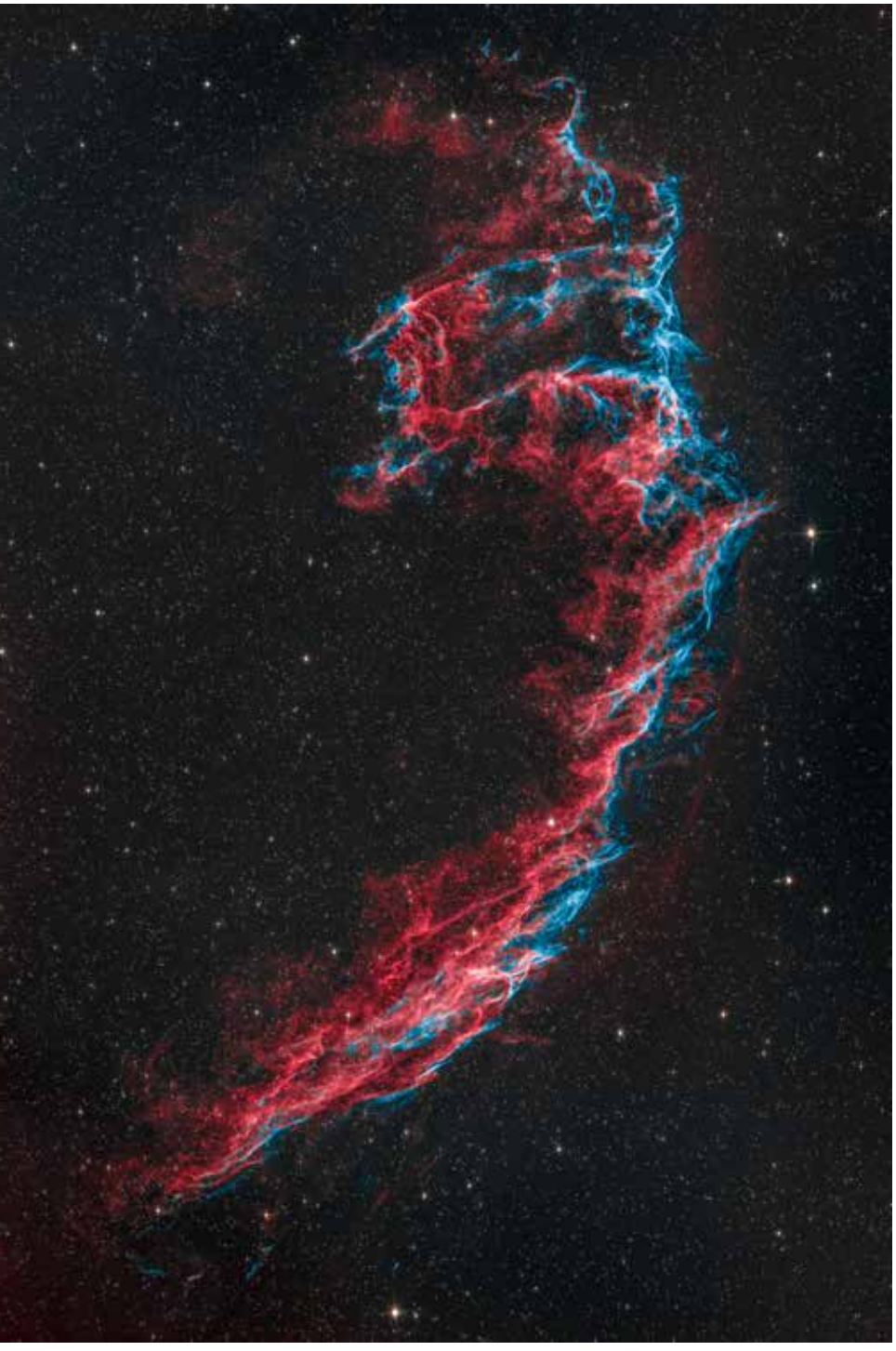
highly ionized space radiation. Our atmosphere, and Earth's magnetic field, do a reasonable job of protecting us against this radiation too. That is not quite the case on the Moon and Mars.

So, using all possible methods: Watch Your Sky... ✨

Image credit: NASA/ESA/STScI/Hubble



This imagery from NASA's Hubble Space Telescope from Oct. 8, 2022, shows the debris blasted from the surface of Dimorphos 285 hours after the asteroid was intentionally impacted by NASA's DART spacecraft on Sept. 26. The shape of that tail has changed over time. Scientists are continuing to study this material, and how it moves in space, in order to better understand the asteroid.



Eastern Veil Nebula by Rob Lyons

Imaged over three nights at the end of September, 2022. This is 17 hours of total exposure time imaged through the new Sky-Watcher Quattro 150P telescope.