# YORK REGION ASTRONOMY ASSOCIATION

RESPONSE TO THE TOWN OF RICHMOND HILL EOI-30-17 EXPRESSION OF INTEREST - PROVISION OF EDUCATION AND PUBLIC OUTREACH PROGRAMMING RELATED TO ASTRONOMY, RELATED SCIENCES AND/OR ASTRONOMICAL RESEARCH







## **TABLE OF CONTENTS**

1	EXECU	ITIVE SUMMARY	3			
2	SUMN	IARY – COMMENTS FROM VISITORS	4			
3	PROP	DSAL OVERVIEW	5			
4	HISTO	HISTORY AND RELEVANT EXPERIENCE6				
5	EXPER	TISE	7			
6	ORGA	NIZATIONAL STRENGTHS	8			
7	MANA	GEMENT AND STAFF	9			
	7.1 A	dditional Volunteers1	2			
8	ADVIS	ORY BOARD1	3			
9	EDUCA	ATION AND PUBLIC PROGRAM OPTIONS1	5			
	9.1.1	Star Talks1	6			
	9.1.2	Family Nights1	6			
	9.1.3	Brownies, Guides, Cubs, Scouts and Senior branches	7			
	9.1.4	School Field Trips1	7			
	9.1.5	Teacher Training1	8			
	9.1.6	After-School Programs 1	8			
	9.1.7	Summer Camps1	8			
	9.1.8	AstroNuts Kids STEM Day 1	9			
	9.1.9 Comm	Continuing Education – Radio Astronomy / Astrophotography / DDO Heritage Series / nunity Lecture Series	9			
	9.1.10	Working With the Local Astronomy Community	21			
	9.1.11	High School Summer Intern Program2	21			
	9.1.12	Astronomical Research Opportunities	21			
10	PROP	OSED ADDITIONAL SPACE REQUIREMENTS2	2			
	10.1.1	Exhibit: History of the David Dunlap Observatory2	2			
	10.1.2	Exhibit: Astrophotography and Related Art2	2			
	10.1.3	Project Spaces2	3			
11	TIMEL	INES2	3			
	11.1.1	30 Days2	3			
	11.1.2	60 Days2	.3			



	11.1	.3 90 Days	24
12	FAC	CILITY SPACES	25
	12.1	Proposed site usage – Administration Building	26
13	HEF	RITAGE ASSETS	28
14	FOU	UNDATION	28
15	SUI	MMARY	28
16	ADI	DITIONAL INFORMATION	29
	16.1	Letter – University of Toronto Re: Heritage Artifacts	29
	16.2	Letter of Support – AstroNuts founder Ray Bielecki	30
	16.3	Letter of Support – York Region Amateur Radio Club	3 <sup>2</sup>
	16.4	Letter of Support – Ramy Ghattas, Logics Academy	32
	16.5	Letter of Support – David M. Dunlap	33
	16.6	Letter of Support – Nicole Mortillaro	34
	16.7	Letter of Support – Kersti Meema	35
17	LET	TTERS OF SUPPORT – DDO VISITORS	36
18	AR	TICLE: VIEWPOINT MAGAZINE   FALL 2016	5
19	AR	TICLE: ACORN, ARCHITECTURAL CONSERVANCY ONTARIO   FALL 2016	54
20	AR	TICLE: INSPIRE ME YORK   SUMMER 2015	56



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## **1** EXECUTIVE SUMMARY

The York Region Astronomy Association (YRAA) welcomes the opportunity to work with the Town of Richmond Hill to create a vibrant, exciting experience for visitors at the David Dunlap Observatory (DDO). YRAA members will be building on eight years of excellence in providing extraordinary astronomy and science-based public outreach and educational activities at the DDO. YRAA also has the expertise and current experience to continue to provide professional maintenance, management and operation of the David Dunlap Observatory and the 74-inch Great Telescope.

YRAA's membership includes 120 dedicated individuals: the entire DDO technical team, all current telescope operators, trained educators, public outreach and program delivery specialists who have kept the Great Telescope operational and made the Observatory part of the fabric of Richmond Hill for the past eight years. YRAA's proposal includes:

- a) Public outreach astronomy programming on weekends
- b) Drop-in star-gazing programs during the week
- c) School field trip programs as well as Scout and Guide programs
- d) After school and summer camp programs
- e) Continuing education classes, programs and lectures
- f) Collaborations with local astronomy clubs and other community organizations
- g) Maintenance, management and operation of the Observatory and 74" Great Telescope
- h) Management and operation of the administration building (including the observatories and telescopes on the roof).

While YRAA is a relatively new organization, its experienced members offer the Town of Richmond Hill a single, seamless solution to fulfil the site needs outlined in the David Dunlap Observatory Park Master Plan as well as the Expression of Interest for the Delivery of Education and Public Outreach Programming at the David Dunlap Observatory. YRAA members' commitment to preserving and celebrating the history of the DDO is reflected in specific programming and exhibits. This proposal includes significantly enhanced astronomy education and outreach programming, community involvement, ongoing maintenance and operation of the 81-year old Great Telescope and continued stewardship of original Observatory artifacts.







## 2 SUMMARY – COMMENTS FROM VISITORS

"We feel a need to express our support for the YRAA and our belief that, based on its members' track records in the care and management of the DDO in the past, the YRAA will continue to do the great job they've been doing all along, and continue to develop more excellent public outreach programs at the DDO."

- Y. Lam

"I very strongly hope that the existing group of volunteers can continue to be involved in the DDO and will be allowed to share their knowledge and passion for astronomy with the public for many years to come."

- David Fruitman

"My impression was that the organizers cared deeply about the past, present and future of the telescope and the lands surrounding it. Their passion for and knowledge about this important Canadian landmark was evident in the quality and delivery of the programming offered. Such expertise and passion is rare and irreplaceable."

- Victoria Fisher

"The work and efforts from the York Region Astronomy Association, has not gone unnoticed by the community... I hope that the City of Richmond Hill continues to work with the York Region Astronomy Association for the David Dunlap Observatory. I couldn't see any other group that could handle this extraordinary place, like they have."

- Pollyanna Herrera

"I can't say enough good things about the passionate and knowledgeable volunteers that have led both the administrative side and program delivery side. Their passion has been the reason that we continue to visit each year."

- Erin Hatton

"The volunteers at DDO are evidently beyond passionate about what they do, they had humour and so much invaluable knowledge. It would be an enormous shame to not have the DDO run as it has been with the volunteers, as my family is hoping to make a pilgrimage to the DDO a yearly tradition... Please continue to allow this wonderful beacon of Canadian scientific history to thrive through the care of the people (volunteers) who have an invaluable knowledge of it and deep passion for it."

- Ruby Dallas

"We appreciate the work by the group that has been looking after the observatory since it was sold by the UofT, and are happy that the York Region Astronomy Association has committed to act as stewards of this landmark."

- Reinhard von Guttenberg

"The volunteers at the observatory were extremely helpful to a curious child. Not only are they passionate about stars, but they were able to create a desire in my entire family to learn more about astronomy."

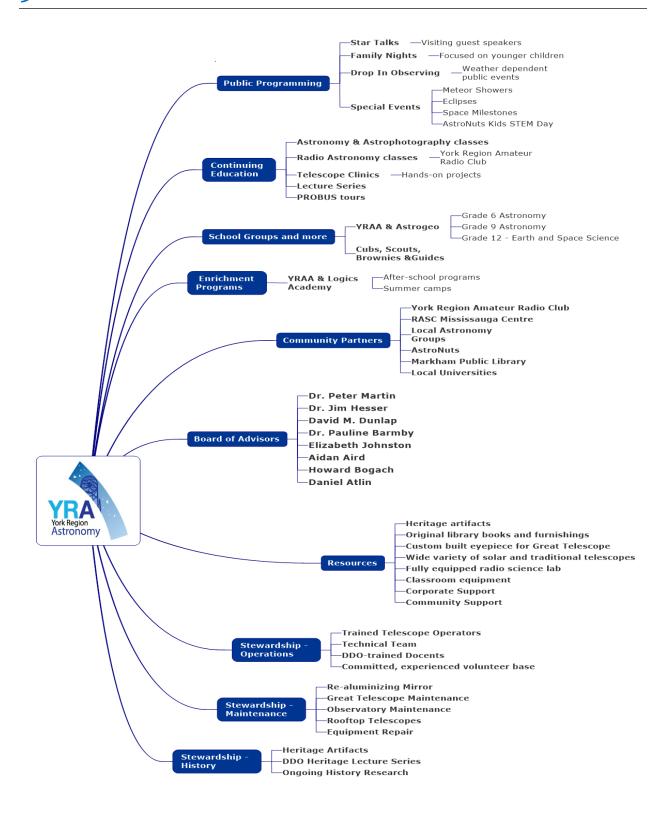
- Winsome Julal

"We were blown away by the passion and dedication the York Region Astronomy Association has for the DDO and their love of the universe." - Chelsea Allman

(Note: Full letters of support can be found beginning on Page 36)



## 3 PROPOSAL OVERVIEW





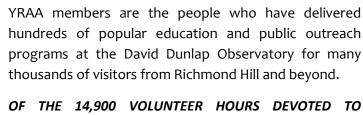
## 4 HISTORY AND RELEVANT EXPERIENCE

Over the past eight years, nearly 30,000 visitors have explored the universe at the David Dunlap Observatory in Richmond Hill. They've enjoyed public outreach nights, school trips, Guide and Scout evenings and special event programs.

The 81-year old facility has been completely maintained and operated by members of the Royal Astronomical Society of Canada, Toronto Centre. As in any volunteer organization, a relatively small team has been most actively engaged in operations and program delivery. This group has now formed the York Region Astronomy Association. It includes the technical team personally trained by the University of Toronto's long-time operations and technical manager at the DDO.

For the past eight years, this specialized team has managed all aspects of maintaining the massive 74" Great Telescope, including re-aluminizing the two and a half ton glass mirror and ensuring the telescope's complex mechanical systems can continue to operate. This team also maintains the Observatory itself, prompting frequent comments from former U of T faculty and staff that the facility





OF THE 14,900 VOLUNTEER HOURS DEVOTED TO PROGRAM DELIVERY AT THE DDO FROM 2009 – 2016, THOSE WHO ARE NOW MEMBERS OF YRAA CONTRIBUTED 92%, OR 13,670 OF THOSE HOURS.<sup>1</sup>

Group members were honoured with the Town of Richmond Hill's Volunteer Achievement Award in 2015.

Their work also earned the 2015 Qilak award, the Royal Astronomical Society of Canada's highest honour for astronomy education and outreach.

The York Region Astronomy Association is a federally incorporated, not-for-profit organization.

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<sup>&</sup>lt;sup>1</sup> Volunteer program delivery records cross-referenced with YRAA membership



## **5 EXPERTISE**

The Town of Richmond Hill is seeking expert assistance in providing astronomy and science-based educational and public outreach programming at the David Dunlap Observatory. The knowledgeable individuals who have made the DDO a success over the last eight years are looking forward to being part of the Observatory's future in partnership with the Town through the York Region Astronomy Association.

#### The YRAA team includes:

- All current telescope operators trained and certified on the maintenance and operation of the Great Telescope and Observatory over the last eight years
- All additional members of the technical team who have been trained in maintaining the Observatory and administration building infrastructure
- More than 100 additional knowledgeable, committed volunteer educators who have been providing public outreach opportunities at the David Dunlap Observatory for many years

A key element of this proposal is the combined programming, operations and maintenance abilities of the YRAA team. The organization is not seeking a maintenance contract; its strength lies in its ability to deliver top-calibre programming while maintaining the pride of stewardship that has marked its work at the Observatory since 2009. Programming, operations and maintenance cannot be considered as separate undertakings since each element is reliant on the others and must be carefully coordinated.



YRAA technical team prepares the vacuum chamber and 74" telescope mirror for the re-aluminizing process.



## **6** ORGANIZATIONAL STRENGTHS

The York Region Astronomy Association (YRAA) has been federally incorporated as a not-for-profit organization and is actively promoting astronomy education and science literacy throughout York Region.

Members have already demonstrated their ability to succeed at the David Dunlap Observatory. Through the efforts of those who are now YRAA members, the Administration Building, Observatory and Great Telescope are today judged by knowledgeable observers to be extremely well-maintained. The DDO programming created and delivered by YRAA members has a large, passionate public following with weekend programs selling out months in advance.

YRAA includes dozens of experts in astronomy education and public outreach. The organization's members have a track record of success in providing superb outreach and education programs at the David Dunlap Observatory and in many other locations throughout York Region and the Greater Toronto Area.



Solar Astronomy Outreach at Angus Glen Library

YRAA's highly-trained specialists have spent years mastering every nuance of the operation and maintenance of the David Dunlap Observatory and the Great Telescope. To ensure the ongoing functionality of the facility, they have continued to maintain the Observatory and telescope in the many months that have elapsed since RASC Toronto Centre ceased operations at the Observatory. This current knowledge is essential to ensuring the 81-year old telescope remains operational.

YRAA has 120 dedicated members, most of whom have spent years providing education and public outreach programs at the DDO. Their commitment – week after week and year after year -- has made the Observatory a public outreach success.



## 7 MANAGEMENT AND STAFF

YRAA plans to put one full-time and two part-time paid positions into place at the David Dunlap Observatory as demand warrants. They will make the DDO buildings accessible to the public during the day to accommodate walk-in traffic. Staff members will be drawn from the experienced team outlined below. In the initial stages of returning the Observatory to its mission of public outreach and education, positions will be filled on a volunteer basis by these dedicated individuals.

Ten trained telescope operators, including veteran U of T operations manager Archie de Ridder, are part of the new organization. These are the individuals who have spent years mastering the intricacies of the David Dunlap Observatory Great Telescope. They've been trained not only in the telescope's operation but in the entire facility's unique operation and maintenance requirements. Each operator has spent hundreds (or in some cases, thousands) of hours ensuring the Great Telescope remains fully operational.

They clean, lubricate, grease and adjust the gears, motors, relays and pulleys required for the 81-year old telescope and dome to remain functional. They maintain the unique electrical systems required for the telescope's operations, nursing aging, quirky equipment back to operational health. They also regularly exercise the Great Telescope and Observatory dome to minimize deterioration of the infrastructure.



Preparing to re-aluminize the Great Telescope mirror

The operators and technical team members have complete knowledge, gained through experience, of the re-aluminizing process for the Great Telescope's 74" main mirror.

As one member of the technical team puts it, "Knowing how to operate the 74" telescope is just the tip of the iceberg. You never see the far greater part of the job which is the daily, weekly and monthly work of keeping the telescope and Observatory running."

Team members have also spent years researching the history of the facility to understand not only the original construction, but the many changes and workarounds that have been incorporated into the systems over the past eight decades.

Technical team members are also active public outreach specialists. Their experience maintaining the heritage Great Telescope brings an added dimension to their public outreach efforts, providing fascinating detail for technically-minded visitors.



#### The technical team includes:

- a) For more than 40 years, **Archie de Ridder** managed and maintained the Observatory, Great Telescope and all associated technical operations. He trained all University of Toronto telescope operators as well as training the first cadre of telescope operators in the post-university era. Archie has spent many more hours providing advice and guidance to members of the YRAA technical team in all aspects of the Observatory and Great Telescope's maintenance requirements. He is ensuring that a lifetime of knowledge and experience in everything from re-aluminizing the 74" mirror to trouble-shooting the electrical system is passed on to the next generation.
- b) **Mike Crabtree** first became involved with the David Dunlap Observatory by bringing his personal telescope to many outreach events at the site. Inspired by the enthusiasm and interest of visitors, Mike has become an integral part of the YRAA team, providing technical guidance, researching vintage mechanical and engineering records and delivering outreach programs to a wide variety of audiences. He is a certified operator on both the 19" and the 74" David Dunlap Observatory telescopes. Mike is an IT professional, having worked in both Professional Services and Technical Sales for major corporations. He also specializes in Amateur Radio (including Emergency Management) and electronics.
- c) Gilles Gaudet was introduced to the David Dunlap Observatory in 2005, working with University of Toronto staff in providing public outreach on a regular basis. When RASC Toronto Centre assumed responsibility for the facility in 2009, Gilles was one of the first technical experts to join the operation and outreach teams. Gilles Gaudet received a major RASC Toronto Centre award for the work he and fellow operator Michelle Johns undertook to return the 19-inch, 1929 telescope at the DDO to full operation. Gilles is certified on the operation of the Great Telescope and is an expert in the maintenance of the telescope and the high-vacuum equipment used for re-aluminizing the 74" main telescope mirror. Gilles is an electronics technician with more than 30 years of technical and software development experience. He has formal training in electro-mechanical devices, electronics and electricity.
- d) **Ed Hitchcock** has been a science educator for over two decades in the fields of biology, paleontology, physics, astronomy and space science. He has taught at both secondary and university levels, as well as presenting lectures to the public at the Ontario Science Centre and the David Dunlap Observatory. Ed's passion for public outreach began in 2003, when he assisted the Ontario Science Centre in hosting more than ten thousand visitors for the close approach of Mars. Ed has been a certified operator of the 74" scope at the DDO for six years. He also operates his own observatory in Grey County.



- e) Michelle Johns has been certified as an operator on the Great Telescope since 2011. Involved in all technical and other maintenance aspects of the Observatory since 2009, Michelle has a background in IT, administration and client support. She has been actively involved in program delivery and in providing educational programs for visiting Guide and Scout troupes. A former member of the Royal Canadian Air Force, Michelle has been a key part of all Observatory maintenance cycles since 2011. Michelle's commitment to the DDO's future led to her nomination for a major RASC Toronto Centre award and her former position as the DDO's Associate Director.
- f) Bill Longo has been a certified operator of the Great Telescope for four years and is involved in every aspect of the telescope and Observatory's maintenance and operation. He has nearly 25 years of experience as a UNIX administrator. He installed and manages the operation of the DDO weather station and webcam. A well-known wildlife and portrait photographer, his DDO projection images have been admired and shared around the world. Bill is also a licensed HAM radio operator.
- g) Paul Mortfield is an astronomer and computer scientist with a Masters in Education. While in California, he created innovative education and public outreach activities with Stanford University's Solar Observatories Group and their involvement in NASA's SOHO Solar spacecraft. He continues collaborations with NASA scientists on a variety of projects and is a member of NASA's Education Products Review team. He teaches astronomy and related courses at Seneca College. Paul's astro-photography appears in publications, galleries and science centres around the world. He is a former Director of the Observatory, is certified on the 74" telescope and is a licensed HAM radio operator. He also operates a remote observatory in the Sierra foothills of California.
- h) Rajesh Shukla is an IT professional who has dedicated many years to astronomy outreach and education. He was the second person certified to operate the Great Telescope when RASC Toronto Centre assumed responsibility in 2009. He led the most recent re-aluminizing of the 74" mirror. Rajesh also trains new telescope operators and maintenance team members. He has been Director of the Observatory with special responsibility for managing the annual maintenance cycle.
- i) Diane Shukla has been involved in program delivery and site maintenance at the DDO since 2009, when RASC Toronto Centre assumed responsibility for the site. Diane organizes and leads the Boy Scout and Girl Guide programs onsite, and using her experience as a former Girl Guide leader, helped to develop the educational curriculum delivered during these events. Since 2010, Diane has coordinated and administered the popular high school student summer intern program at the DDO. Diane has been a certified operator of the 74" great telescope since 2011.



j) Chris Vaughan (@AstroGeoGuy) is a professional geophysicist and astronomer with a passion for science public outreach and education. His weekly <u>Astronomy Skylights</u> bulletin, written for non-astronomers, is received by subscribers worldwide. Chris is also a regular columnist at Space.com, writing about the use of mobile devices in astronomy. Since 2012, Chris has been a certified operator of the Great Telescope and part of the technical maintenance team. He hosts school field trips at the DDO for ages ranging from pre-schoolers to Grade 12. Chris has served two terms as president of the Canadian Exploration Geophysical Society (KEGS) and is a member of the Society of Exploration Geophysicists, the Canadian Geophysical Union, the American Geophysical Union and the Planetary Society.



YRAA technical team members with the freshly re-aluminized Great Telescope mirror, July 2016

#### 7.1 ADDITIONAL VOLUNTEERS

YRAA has already attracted 120 paid members. These committed volunteers have been involved in public outreach and education at the David Dunlap Observatory for years. They range from educators, both retired and active, to scientists, students, amateur and professional astronomers and historians. They include artists, designers, engineers and police officers. All are committed to ensuring the DDO continues to offer inspiring and enlightening education and outreach opportunities to the residents of Richmond Hill and beyond. They recognize and support YRAA's goal of making the Observatory a true success story within the Town of Richmond Hill and are eager to provide the expert volunteer support needed for this undertaking.

This dedicated team is augmented by support from the Royal Astronomical Society of Canada, Mississauga Centre, which includes approximately 130 professional and amateur astronomers who are trained educators and public outreach experts. Mississauga Centre members look forward to working with YRAA to provide additional volunteer support for larger-scale public outreach events.



### 8 Advisory Board

The York Region Astronomy Association has assembled an Advisory Board comprised of science and business leaders who are willing to offer their guidance and advice as YRAA and its mission evolves at the DDO. The following individuals have honoured us with their involvement as our initial Advisory Board members.

**Dr. James Hesser** was, for 27 years, Director of the Dominion Astrophysical Observatory, Herzberg Institute of Astrophysics in Victoria, British Columbia. He is currently a Strategic Advisor to the National Research Council - Herzberg. Dr. Hesser is past-president of the Canadian Astronomical Society (CASCA) and of the Astronomical Society of the Pacific. He is past vice-president of the American Astronomical Society. Dr. Hesser also led International Year of Astronomy (IYA) efforts within Canada (2005-2009). Under his direction, the IYA provided "Galileo moments" to more than two million Canadians through more than 3,600 separate events.

**Dr. Peter Martin** is a member of the Order of Canada. He is co-founder of the Canadian Institute for Theoretical Astrophysics, past-chair of the University of Toronto's Department of Astronomy and Astrophysics and a former director of the David Dunlap Observatory. Professor Martin was the inaugural Director of the Dunlap Institute from June 2008 to August 2010, Acting Director from September 2012 to June 2013, and Interim Director from July 2013 to December 2014.

**David M. Dunlap** is a grandson of David Alexander Dunlap after whom the Observatory is named. He is a graduate of the University of Toronto (BASc - Electrical Engineering) and spent most of his working life as owner of G.F. Thompson Co. Ltd., a manufacturer and distributor of specialty plumbing products with factories in Newmarket, Ontario and Jiangmen, China. In 2010 he was awarded an honorary doctorate by the University of Toronto for his work in helping establish the Dunlap Institute for astronomy and astrophysics.

**Elizabeth Johnston** grew up in York Region and lived in Australia for 15 years where she worked with the Dean of Commerce & Economics, The Small Business Development Corporation and her own marketing company, Magnetic Data. Twenty-two years ago, Ms. Johnston returned to Canada and is currently President of The Business Women's Network of York Region, Director of the Lake Simcoe Championship Ice Fishing Derby, Business Partner of Canadian Tire Keswick & Canadian Tire Petroleum and Owner of Thorah Garden Island Farm (organic vegetables), Trail of the Woods Bed & Breakfast and Kids Cash, a product to help teach children money management.



**Aidan Aird** has created a not-for-profit organization in Ontario, Developing Innovations, which is dedicated to inspiring, celebrating and promoting STEM (science, technology, engineering and math) education. He balances this with his educational responsibilities and participating annually in dozens of community and extracurricular events such as the Canada Wide Science Fair. Mr. Aird curated a natural sciences exhibit at the David Dunlap Observatory during the 2016 season that had a remarkable impact on visitors of all ages.

**Dr. Pauline Barmby** is Associate Dean, Graduate and Post Doctoral Studies, with the Faculty of Science at the University of Western Ontario. She is an Associate Professor with the Department of Physics and Astronomy. Dr. Barmby received a BSc in physics and astronomy from the University of British Columbia and a PhD in astronomy from Harvard University. From 2001-2007 she was a staff scientist at the Smithsonian Astrophysical Observatory, part of the team that built the IRAC camera for NASA's Spitzer Space Telescope. Part of U of W since 2007, she has taught courses ranging from first-year physics and astronomy to graduate astrophysics and computing. Her research interests are in observational studies of star clusters and star formation in nearby galaxies and the emerging field of astroinformatics. Dr. Barmby has served on advisory boards for international telescopes and the Canadian Astronomical Society's Board of Directors.

Daniel Atlin joined the University of Guelph in 2015 as Vice President (External). Mr. Atlin oversees the Department of Alumni Affairs and Development, the Department of Communications and Public Affairs, and government and community relations. He leads the development of public and private philanthropic support for the University, and builds relationships with key stakeholders. Previously, Mr. Atlin was Seneca College's Vice-President, Strategy and College Affairs, where he led strategic planning, government relations, advancement and alumni affairs, and capital planning and facilities. Mr. Atlin joined Seneca from the University of Toronto, where he served as Assistant Vice-President of Government, Institutional and Community Relations.

**Howard Bogach** serves as the Chief Executive Officer, President and a Director of Tarion Warranty Corporation. Mr. Bogach has more than 20 years of experience in the financial services, cooperative and member service sectors. Prior to joining Tarion, Mr. Bogach served as the President and Chief Executive Officer of Central 1 Credit Union (Formerly Credit Union Central of Ontario (CUCO)). Mr. Bogach also served as the President and Chief Executive Officer of Metro Credit Union. Mr. Bogach began his career in Western Canada at Hudson's Bay Company, Touche Ross, Credit Union Deposit Guarantee Corporation and Capital City Savings. He graduated from University of Manitoba with a Bachelor of Arts in 1975 and a Bachelor of Commerce (Honours) in 1977.



## 9 EDUCATION AND PUBLIC PROGRAM OPTIONS

The number and range of programs offered at the DDO have grown significantly over the past eight years, and more opportunities lie ahead. The York Region Astronomy Association, operating at the DDO with a focused mandate to serve the York Region community, intends to dramatically increase the number and variety of programs over those previously offered.

These new programs will include continuing education classes, after school and summer camp science enrichment programs as well as Speaker Series' events and drop-in observing nights. YRAA looks forward to working with Town of Richmond Hill staff to identify new programming and event opportunities.

Each program is designed to make the astronomical sciences accessible and meaningful to an audience that may range from the general public to science-focused school groups to lifelong learners. In the case of public programs, YRAA members add 'astro-hosts' to their roster of staffing responsibilities. These hosts are trained in creating a welcoming, 'ask anything' environment for visitors.

A focus on learning underpins every program offered by YRAA members. Their goal is to ensure each visitor learns something new and exciting about astronomy and space science. The history of the facility and its role in the advancement of astronomy in Canada are key components of every program.

Visitors are encouraged to build on their DDO experience by using astronomy-based mobile applications, tools such as Starfinders and by continuing to improve their own science literacy.

The results can be seen in the comments received from visitors (beginning on page 36) highlighting the positive, educational experiences YRAA members have provided at the David Dunlap Observatory.

YRAA members have extensive experience delivering public outreach programs and in a seamless transition will provide the astronomy and educational opportunities outlined below.





#### 9.1.1 Star Talks

Star Talk nights have been organized and run by those who are now YRAA members since 2009. Guest speakers are astronomers, educators and space scientists, sharing their knowledge and inspirational presentations with thousands of visitors. Star Talk visitors have enjoyed intimate presentations by many of astronomy's great visionary minds as a result of friendships and networks built over decades by YRAA members. Speakers have always been chosen for their ability to share complex scientific concepts with a general audience. Diverse presenters highlight the work done by Canadian scientists and promote interest in science careers. Topics have ranged from the nature and significance of black holes to the history of moon landings to the latest technical breakthroughs in astronomy and space science.

Many visitors find Star Talks so inspiring, they schedule group events that allow them to bring friends and family to multiple evening programs.

Star Talk evenings wrap up with a tour of the Observatory and, if skies are clear, gazing through the Great Telescope. Star Talk nights involve a maximum 70 ticket holders (based on space limitations in the Lecture Hall.) The two-hour program includes self-guided tours through the Administration building and a 40-minute lecture followed by a question and answer period. On clear nights, YRAA members will continue to set up additional telescopes on the lawn to provide visitors with a variety of views of the night sky. Tickets will be obtainable online and have most recently been priced at \$10. Facilities required: Lecture Hall, Library, art gallery and exhibit spaces on ground floor of Administration Building, Observatory and surrounding lawn area



#### 9.1.2 Family Nights

Family Nights are tailored to the needs and interests of parents with younger children. These evenings are an opportunity for parents to introduce their children to a local science-focused experience. Family Nights allow parents to share an entertaining, educational and affordable evening with their children.

In the 'Space Crafts' room, youngsters are guided to create their own constellation, construct a pinhole viewer, build an alien (or become one) and learn about space through hands-on activities. The range of craft supplies and themes will change frequently to accommodate the DDO's many repeat visitors. Family Nights include the craft room, a tour of the Administration Building, a visit to the Great Telescope and a presentation in the Skylab, which offers an accessible introduction to the night sky no matter how



overcast the skies. The 90-minute program is not weather-dependent and tickets have most recently been priced at \$8.

Facilities required: Craft room and Skylab on 2<sup>nd</sup> floor, Library, art gallery space and exhibit space on ground floor of Administration Building, Observatory and surrounding lawn area



## 9.1.3 Brownies, Guides, Cubs, Scouts and Senior branches

YRAA members are familiar with the astronomy-themed badge requirements for Cubs, Scouts, Brownies, Guides and Senior branches. They have delivered customized education programs for these groups at the DDO on a regular basis. The two-hour private programs are provided by YRAA members, some of whom were themselves Girl Guide leaders. Programs include an interactive presentation in the (Administration Building) Lecture Hall, a look at the night sky in Skylab, and a tour of the Observatory. When weather permits, the program

includes viewing through the Great Telescope. Several local troops have chosen to postpone working on their astronomy-themed interest badges until they can attend a program at the DDO under the guidance of YRAA instructors. Most recently, pricing for Guide and Scout programs was \$200 for the first 20 children, and \$8 per additional child. Adult leaders attend the program at no cost. Facilities required: Administration Building Lecture Hall and Skylab, Observatory.

#### 9.1.4 School Field Trips

To date, DDO field trip programs have been managed and delivered by YRAA member Chris Vaughan, whose <a href="https://www.astrogeo.ca">www.astrogeo.ca</a> programs would continue to be offered through YRAA. AstroGeo tours are



offered on both a half-day and full day basis. They are supplemented with specially designed Educational Programs and hands-on activities led by trained scientists and linked to the Ontario elementary and secondary school curriculum. Programs are currently offered in English, French and Mandarin.

Available programs include Solar System Motions, Clocks and Calendars, Stars, Solar Science and Space Weather, Planetary Science, Exoplanets, Optics, Astronomical Equipment, Rocks and Minerals, Mining and Mineral Exploration, and Age-Dating for Archaeology and the Environment. Additional program information, including costing, is available on request. Facilities required: Lecture Hall, Skylab, Rooms 209 and 211, Library, exhibit spaces, basement Project Rooms, Observatory, lawns







#### 9.1.5 Teacher Training

Many members of the York Region Astronomy Association are science teachers within the York Region and GTA school systems and post secondary streams. YRAA looks forward to providing professional enrichment days for teachers who wish to expand their ability to teach astronomy and the space sciences more effectively. Pricing will be based on York School Board standard models but the per-person cost is expected to fall between \$35 - \$50 for a 2.5 hour session.

Facilities required: Lecture Hall, Library, exhibit spaces, Rooms 209 and 211), basement Project Rooms, Observatory

#### 9.1.6 After-School Programs

Building on an established relationship with education provider Logics Academy, YRAA will offer after-school science enrichment programming for York Region students. Logics Academy is an approved vendor with the York Region District School Board and, working with YRAA members, is prepared to custom-tailor its impressive science education programming to reflect the opportunities presented by housing those programs in the historic David Dunlap Observatory. After-school programs will begin with a focus on aerospace fundamentals. Pricing has yet to be established but is expected to fall within the standard range of \$150 - \$170 for eight classes.

Facilities required: Two 2<sup>nd</sup> floor classrooms (Rooms 209 and 211), Lecture Hall, basement Project Rooms, lawns

#### 9.1.7 Summer Camps

Logics Academy also looks forward to working with YRAA in delivering age-appropriate, science-themed summer day camp programs for the Richmond Hill community. YRAA members will provide astronomy-related expertise to ensure the programming reflects the

significance of the DDO site. Pricing has not yet been established but will fall within industry standards for one and two-week day camp experiences.

Facilities required: Two 2<sup>nd</sup> floor classrooms, Lecture Hall, basement Project Rooms, lawns, Observatory



#### 9.1.8 AstroNuts Kids STEM Day

YRAA members have formed a successful, rewarding relationship with the AstroNuts, a group of young, aspiring space enthusiasts led by Ray Bielecki. The AstroNuts run a yearly science fair promoting STEM (Science, Technology, Engineering and Math) for children.

For the last two years, the fair has been hosted at the David Dunlap Observatory and staffed by volunteers who are now YRAA members. Last year, YRAA members collaborated with ARISS (Amateur Radio on the International Space Station) to create a successful live link between the children attending the event and astronaut Tim Peake aboard the ISS. In 2015, YRAA members coordinated a live Skype conversation between event participants and Canadian astronaut Cmdr. Chris Hadfield. Regularly attracting 300-400 children and families, the AstroNuts Kids STEM Day would continue to be a highlight of the DDO calendar. Admission has typically been limited to \$5 per adult.

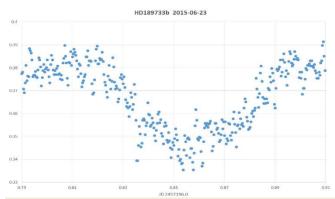
Facilities required: all rooms in Administration Building, Observatory, all surrounding spaces.

## 9.1.9 Continuing Education – Radio Astronomy / Astrophotography / DDO Heritage Series / Community Lecture Series

#### **Radio Astronomy and Radio Science**

Radio astronomy is a significant part of the DDO's research history.

HAM radio courses have already been offered at the David Dunlap Observatory in a collaboration between YLAB, the York Region Amateur Radio Club and the York Region Astronomy Association. YRAA is now working with the York Region Amateur Radio Club to develop an ongoing communication/education program that involves satellite and International Space Station communication as well as radio astronomy. Projects would include the radio detection of solar flares



High school student research collaboration with YRAA to detect a Jupiter size planet passing in front of its host star 260 light years away.

Classes would run for 90 minutes – two hours, once a week for four weeks, and discuss the basics of radio astronomy, as well as providing appropriate projects for participants. Costs are expected to fall within the range of \$10 per class plus materials.

and meteor showers.

Facilities required: Administration Building 2<sup>nd</sup> floor radio science room, Room 209, Room 211, rooftop, basement Project Rooms, Lecture Hall



#### Astrophotography

YRAA members include many highly-accomplished astrophotographers who regularly share their knowledge through educational workshops. Astrophotography classes will become part of the regular programs offered at the David Dunlap Observatory to teach participants how to capture their own images of the night sky using digital cameras, phones and other mobile devices.

Gallery displays of astrophotography images are already in place at the Dunlap Observatory and will be regularly rotated with new art shows. Evening or weekend workshops will be available at beginner and intermediate levels. A series of three, two-hour classes would be priced at approximately \$50.

Facilities required: Lecture Hall, 2<sup>nd</sup> floor classroom, Room 104, lawn area outside the Observatory



#### The David Dunlap Observatory Heritage Series

In association with the University of Toronto and several other Ontario universities, YRAA plans to build on its extensive network within the Canadian astronomical community in developing a speaker series focused on the history of the Dunlap Observatory. Several former directors of the Observatory as well as key staff members have already indicated their enthusiasm for taking part in this initiative.

The series will highlight the Observatory's role in Canadian science history, include scientific demonstrations and discussions, the Observatory's history within the community and may include a walking tour of the grounds. These 90-minute Sunday afternoon programs will be scheduled monthly and include a guided tour of the heritage exhibits and a tour of the Observatory. Anticipated cost per ticket is \$12.

Facilities required: Lecture Hall, Library, Heritage exhibit area, Observatory

#### **Community Lecture Series**

In partnership with a variety of community organizations, YRAA is proposing to organize, advertise and host several speaker series focused on community interests, particularly those that are science-based. Discussions have already taken place with a number of local art and photography organizations as well as several local authors about co-producing these talks. These lecture series would run over a four to six week period, introducing a broader audience to the David Dunlap Observatory and further embedding the site as a community resource. Talks would take place in the Administration Building Lecture Hall which can seat up to 75 guests.

Facilities required: Lecture Hall, Heritage exhibit area, Observatory





## 9.1.10 Working With the Local Astronomy Community

YRAA understands the desire of other local astronomy organizations to share the DDO experience. YRAA would be pleased to work with organizations wishing to hold events at the Observatory. This would ensure the facility was made available to local groups interested in promoting astronomy and space science while maintaining the safe operation of the Great Telescope and Observatory.

Facilities required: to be determined

#### 9.1.11 High School Summer Intern Program

In Ontario, students attending high school are required to complete a minimum of 40 hours of community service in order to qualify for graduation. As a registered not-for-profit, YRAA looks forward to continuing the seven year tradition of offering a student intern program at the DDO during the public program season, (May to October). The program typically accepts up to 25 interns each season. The program offers students the opportunity to experience each guest speaker's lecture as well as learning how to use a telescope and engaging with the public in promoting science literacy. Past experience has shown the internship program to be so rewarding that many students continue volunteering at the DDO long after their community service requirement has been met. Several have returned to their schools and started their own astronomy clubs. A number of former DDO student volunteers are now pursuing university degrees in the sciences.

#### 9.1.12 Astronomical Research Opportunities

The David Dunlap Observatory was home to many years of important astronomical research. Increasing light pollution, poor climate, changing research interests and aging equipment have all been factors in its decline as a front-line research facility. These are the realities facing nearly all older, mid-sized astronomical observatories. However, the DDO can still provide research opportunities for high school students interested in undertaking 'real science' as part of their studies.

Through collaboration with YRAA members, this has already included data collection to study exoplanets (planets orbiting stars in other solar systems), which led to several students winning gold medals in a York Region science fair competition. Moving forward, YRAA plans to expand research opportunities to allow more York Region and GTA students to participate in spectroscopic studies of binary stars, stellar classifications, supernova typing, and radial velocity measurements. Students will also be able to engage in radio astronomy projects that honour the heritage of radio astronomy research that took place on the DDO grounds.



## 10 PROPOSED ADDITIONAL SPACE REQUIREMENTS

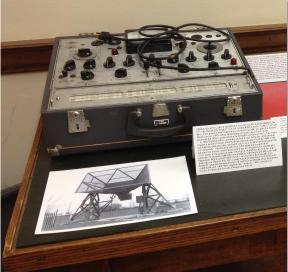
#### 10.1.1 Exhibit: History of the David Dunlap Observatory

The University of Toronto possesses an extensive collection of artifacts related to the history of the Observatory. YRAA members are the stewards of additional significant pieces. YRAA and U of T look forward to developing a partnership in a semi-permanent exhibition on the ground floor of the Administration Building, showcasing items that celebrate the history of Canadian astronomy and space science.

The university, along with the Museum of Science and Technology in Ottawa, have indicated their interest in working with YRAA for this purpose. The exhibit would be available at no extra cost to Observatory visitors and would form part of the ongoing DDO experience.

Facilities required: Administration Building, Rooms 111, 112, Library





Part of the University of Toronto DDO artifact collection that would be available to YRAA for exhibit at the Observatory

#### 10.1.2 Exhibit: Astrophotography and Related Art

Designed to highlight the work done by today's astrophotographers and to encourage visitors to consider photographing the night sky for themselves, a regularly updated gallery of images would be available in the rooms opposite the Library on the ground floor of the Administration Building. The images currently in place in this area are all the work of YRAA members. In addition to astrophotography, YRAA will partner with local community art and photography groups interested in displaying work celebrating the DDO Park environs.

These rooms would also be used as part of the astrophotography classes described above. There would be no additional cost for visitor access.

Facilities required: Administration Building, Room 104, 103



#### 10.1.3 Project Spaces

YRAA plans to offer visitors a hands-on opportunity to experience the nuts and bolts of amateur astronomy. Spaces in the basement of the Administration Building, designated as Project Rooms, will

be used to offer classes for both students and adults in building a variety of astronomy-related projects. These projects will range from grinding mirrors to building telescopes, specialized mounts for binoculars and a host of other activities.

These projects may be done in conjunction with other individuals and organizations offering particular expertise to participants.

Facilities required: Administration Building basement, Machine Shop, Room 54



## 11 TIMELINES

Understanding the Town wishes to see the David Dunlap Observatory and Administration Building return to use as a community resource as soon as possible, YRAA is prepared to meet the following timelines in providing program delivery that will immediately benefit the residents of Richmond Hill. Should YRAA be the successful applicant, the following schedule of events will be implemented.

#### 11.1.1 30 Days

Within 30 days, YRAA will again be offering star-gazing nights to the public. It will begin by offering drop-in nights, weather permitting, one to two nights per week, to re-introduce the public to the experience of looking through the largest optical telescope in Canada. YRAA will use its extensive social media base as well as its mailing list of several thousand supporters to promote the David Dunlap Observatory's return to active use under the ownership of the Town of Richmond Hill. YRAA will also continue to cross-promote the Observatory at public outreach activities throughout York Region. YRAA will also notify local Scout, Cub, Guide and Brownie groups that have been waiting to visit the Observatory they can now book programs.

#### 11.1.2 60 Days

Within 60 days YRAA will be offering ticketed programs, including Family Nights and Star Talks. These programs, which are typically sold out months ahead of time, in the past have been run from May through the end of October. YRAA already has a full ticketing/payment system in place that can immediately be utilized for this purpose.

Arrangements will be formalized with the University of Toronto to develop an initial exhibit of DDO artifacts in the Administration Building, which will promote the history of Canadian astronomy and space science.



#### 11.1.3 90 Days

Within 90 days YRAA will add to the above, two continuing education lecture series. These programs, which will focus on aspects of radio science, space science and astronomy, will be marketed to members of the public, PROBUS (retired and semi-retired professionals) groups and lifelong learners through local media and through Town event calendars as appropriate.

The David Dunlap Observatory Heritage Series will be launched, highlighting speakers with first-hand knowledge of the Observatory's history.

If timing permits, marketing will also begin for summer camp programs at the DDO, to be provided by YRAA and Logics Academy.

If timing permits, applications will be accepted from high school students who wish to apply for a summer internship volunteer position.

Beyond 90 days, additional programs will be added as outlined above to ensure the David Dunlap Observatory is a vibrant, active centerpiece within the David Dunlap Observatory Park.







## 12 FACILITY SPACES

YRAA expects to utilize all areas of the two buildings to provide exciting, effective education and public outreach programming.

From Skylab, with its padded, carpeted floor and YRAA's immersive projection system, to exhibit spaces, fully outfitted classrooms, radio science room and basement project rooms, the administration building has the ability to continue to provide best-in-class public outreach and educational programs for thousands of York Region residents and students.

YRAA has developed strong working relationships with educational institutions and community organizations that will provide a variety of science-based displays and presentations within the administration building and the Observatory.

YRAA has also assembled a fully equipped basement machine shop stocked with the many custom tools needed for ongoing maintenance of the Great Telescope and Observatory.

Several rooms in the administration building will continue to be required for administration, maintenance and storage purposes, including the education office (Room 203), Operations (Room 202) and storage areas on the second floor and in the basement. The cloak room (Room 201) is used for visitor coats, backpacks and shoes during school and public programs. Room 61 in the basement is required for re-aluminizing smaller mirrors associated with the facility and telescope repair and maintenance.

The Lecture Hall, Library and Donor Room (Room 204) are all integral parts of presenting the narrative of the David Dunlap Observatory and would remain accessible to the public as part of the ongoing celebration of the Observatory's history.

In the main Observatory, the key piece of equipment YRAA will be putting to use for public outreach is the massive custom telescope eyepiece that offers visitors the thrill of looking through the largest optical telescope in Canada. When the University of Toronto sold the David Dunlap Observatory lands in 2008, the eyepiece it had used for outreach activities disappeared during the staff departure.

The eyepiece used for the last eight years of outreach at the DDO is custom made for telescopes of this class. It remains in the stewardship of the York Region Astronomy Association.

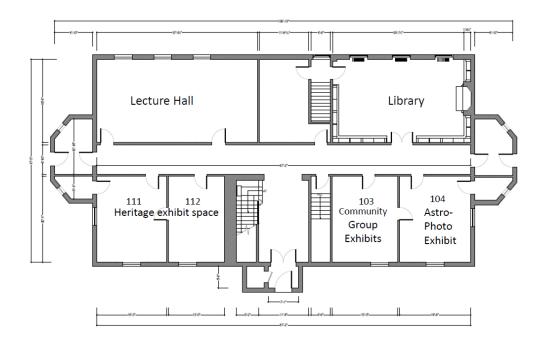
YRAA expects to fully use both floors in the Observatory dome. The upstairs observing floor is needed, of course, for public programs, tours and special events. The downstairs entrance floor, which currently houses a number of display units from the McLaughlin Planetarium as well as heritage pieces from the Observatory, would benefit from the addition of more modern, interpretive display units.

While the physical nature of the Observatory limits some display opportunities, YRAA looks forward to working with the Town to develop an enhanced educational experience on the ground floor of the building, including climate-hardened interactive displays and visual components.

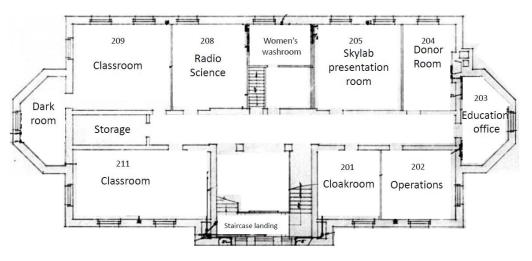


## 12.1 PROPOSED SITE USAGE – ADMINISTRATION BUILDING

#### FIRST FLOOR

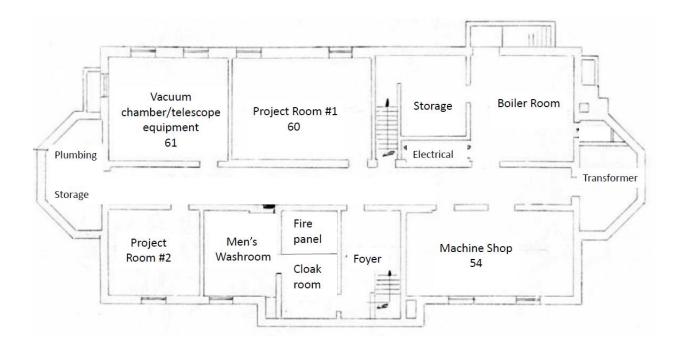


#### SECOND FLOOR





### **BASEMENT**





## 13 HERITAGE ASSETS

The University of Toronto has granted YRAA stewardship of all DDO heritage artifacts currently housed in the Administration Building and Observatory. (Section 16.1) Should YRAA be the successful candidate with the Town of Richmond Hill, the following items are among the many heritage artifacts that will continue to be available to delight visitors and students.

- All heritage library books, including the Radcliffe Observatory journals dating from 1863
- Library andirons, designed by building architects Mathers & Haldenby
- Large scale portraits of David Alexander Dunlap and Jessie Donalda Dunlap
- Large collection of antique furniture
- Original brass equipment from the optical laboratory
- Additional artifacts from the Dunlap Family

### 14 FOUNDATION

The York Region Astronomy Association, based on members' eight years of experience managing and maintaining the DDO, is confident of its ability to manage costs associated with program delivery. However, the organization believes it can do more. Should YRAA have the opportunity to negotiate a lease with the Town of Richmond Hill to provide space science programming and related educational opportunities, it plans to create a Foundation that will raise funds for major educational projects. YRAA will build on existing relationships with a number of major family and corporate donors to create a Foundation supporting future program growth at the DDO.

## 15 SUMMARY

Membership in the York Region Astronomy Association includes the program delivery specialists, technical team and telescope operators who have made the Observatory part of the fabric of Richmond Hill for the past eight years. The expertise Richmond Hill is seeking is now **only** available through the York Region Astronomy Association.

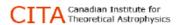
YRAA's unique membership base, community support and demonstrated commitment to the Dunlap Observatory offers the Town a simple, effective solution to the challenge of maintaining and operating an iconic heritage facility.

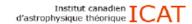
York Region Astronomy Association members have the current knowledge, expertise, infrastructure and dedication required to ensure the David Dunlap Observatory's continued successful program delivery and operation within the Town's DDO Park. We look forward to working with you.



#### **16** Additional Information

### 16.1 Letter – University of Toronto Re: Heritage Artifacts





INCORPORATED 1986

Professor P. G. Martin, PhD, FRSC . TEL 416-978-6840 . FAX 416-978-3921 pgmartin@cita.utoronto.ca

11 August 2016

Karen Mortfield York Region Astronomy Association

Re: Stewardship of material loaned by the University of Toronto for the David Dunlap Observatory (DDO)

Dear Karen:

In Dec. 2014 the University of Toronto made a loan of period library holdings (401 boxes) originally from the DDO with the intention of enhancing the programming at the DDO being carried out by the Toronto Centre of the Royal Astronomical Society of Canada (RASC – TC). This was followed up in Jan. 2015 with a second loan of period furniture from the DDO. I recall that is was you that selected the material on behalf of the RASC – TC. In the University's judgement the RASC – TC was deemed to be a suitable steward of the loaned material because, by concrete example, members of the Toronto Centre had demonstrated both their commitment to public education and outreach at the DDO and their expertise in being able to handle the many complex technical issues relating to the operation and maintenance of the large, but old, 74-inch telescope. At the time of the DDO 80th anniversary celebrations, the University made a further loan contribution of portraits of Donalda and of David Dunlap.

The announcement that the RASC – TC will soon no longer be involved at the DDO comes as both a surprise and a disappointment and raises the issue of the cessation of the programming at the DDO and the imminent return of the loaned material to the University. Therefore, I am encouraged that you and the knowledgeable cohort within the RASC – TC that was active at DDO have now formed the York Region Astronomy Association, with the express intent of continuing the education and public outreach programming at DDO. This is a wonderful development as there is no other group with the expertise and demonstrated ability to do this. Therefore, I am writing to you on behalf of the University with the hope that York Region Astronomy Association will take over the stewardship of loaned material as part of continuing the programming at the DDO.

Sincerely

Peter G. Martin

Peter 3. martin

University of Toronto • 60 St. George Street • Toronto, ON M5S 3H8 • Canada • 416-978-6879



#### 16.2 LETTER OF SUPPORT — ASTRONUTS FOUNDER RAY BIELECKI







#### October 2016

#### To the attention of the Richmond Hill town council:

I wanted to let you know about the very positive experience that I have had over the past few years with the members of the YRAA and the DDO.

They are tireless, passionate and totally dedicated to bringing the highest level of educational excellence to thousands of people.

The AstroNuts Kids space club is recognized by NASA, the Canadian Space Agency and the European Space Agency as well as by many science organizations, STEM-based educational companies and all of the school boards in southern Ontario. They have all commented on the great success that our annual "AstroNut space camp & STEM contest" has attained and I firmly believe that the reason for our success has been members of the YRAA.

YRAA members provided the technical expertise that helped us make an ARISS contact 'LIVE" with the International Space Station and hundreds of children were thrilled to speak with British astronaut Tim Peake. YRAA provided the expertise to make that special event become a reality.

YRAA members have demonstrated their enthusiasm for working with other community groups, from the AstroNuts to the York Region Amateur radio club, YLAB, university, high school and university educators and students and local libraries.

The AstroNuts Kids space club looks forward to working with YRAA in the future to promote science literacy. They are the best!

I sincerely encourage you to grant the YRAA the opportunity to provide their high level of educational excellence to the thousands of people that participate and benefit from their outreach efforts.

Best regards,
Ray Bielecki
President
AstroNuts kids space club
AstroNuts Space Camp & STEM contest
www.astronutskidsspaceclub.com
cell 416-996-8980



#### 16.3 LETTER OF SUPPORT - YORK REGION AMATEUR RADIO CLUB



## York Region Amateur Radio Club P.O. Box 28590 Aurora ON L4G 6S6 Canada

To: York Region Astronomy Association (YRAA) From: York Region Amateur Radio Club (YRARC)

Re: Collaborative programs at the David Dunlap Observatory

We understand that members of the York Region Astronomy Association are planning to expand and enhance the range of science-based programs and courses you have already been offering at the David Dunlap Observatory for several years.

The York Region Amateur Radio Club would welcome the opportunity to collaborate with you in several areas of radio science that fall within your education and public outreach mandate.

#### Those areas include:

- 1. Building and deploying Solar Flare Detectors. We understand you have already built several solar flare detectors in conjunction with local high school science classes and astronomy clubs. They are useful in educational programs related to discussions of the Sun, solar flares, aurora, and Space Weather. We would be happy to join the program as a partner in developing an education component on radio propagation, radio communications and its connection with the Sun.
- Spacecraft/Satellite Communications and ARISS. You've already successfully managed an amateur radio
  conversation with the International Space Station which was very successful. We would be interested in
  collaborating in the development and installation of hardware at the DDO (incorporating an education and
  public outreach component) that would demonstrate communications & telemetry either in real time or
  offline.
- 3. Counting Meteors via Radio. Given Ontario's generally poor weather conditions we understand your interest in having a passive method of detecting and monitoring meteor showers. Radio detection is one possible method. We would be interested in exploring a collaboration to develop and install the hardware at DDO (along with an education and public outreach component) to continuously run a meteor detection system.

Congratulations on your efforts to continue your education and public outreach success at the Observatory. We're interested in being a community partner working in collaboration with the York Region Astronomy Association.

Yours truly.

Chris Sullivan

President, York Region Amateur Radio Club

president@yrarc.org



#### 16.4 LETTER OF SUPPORT - RAMY GHATTAS, LOGICS ACADEMY



...a playground for innovative minds

To: The Town of Richmond Hill

Re: Request for Expressions of Interest, David Dunlap Observatory

It's my pleasure to support the York Region Astronomy Association in their efforts to become the successful applicant in providing astronomy and science-based programming at the David Dunlap Observatory in Richmond Hill.

Logics Academy has an extensive record of success in providing top-quality education experiences for students in the York Region District School Board along with many other school boards and hospitals. We are an approved vendor and service provider, offering curriculum-specific programming that encourages our young people to achieve excellence in the STEM (science, technology, engineering and math) disciplines. Logics Academy is looking forward to collaborating with YRAA in bringing appropriate after school, day camp and special event programming to our community's iconic Dunlap Observatory.

I've known the members of York Region Astronomy for several years and have been endlessly impressed by their passion for promoting science literacy. Their commitment to the Observatory is unparalleled. I know thousands of visitors, myself among them, have a new-found respect for the study of astronomy and the DDO's history as a result of YRAA's efforts.

What many visitors may not appreciate is the amount of effort required to keep antique technology operational as well as inspirational. YRAA members spend thousands of volunteer hours each year ensuring the facility's ongoing function. That hard, unsung work is what has kept the DDO from becoming a dusty museum piece; what makes it such an ideal location to inspire young minds.

We have worked successfully in the past with York Region Astronomy members and look forward to expanding that relationship to include regular enrichment programs at the Observatory that will benefit students from across York Region.

YRAA includes educators, astronomers, scientists, engineers and artists. What they all have in common is their passion for the DDO and their commitment to its future. I believe YRAA is by far the most qualified organization to offer programming and ongoing stewardship of this amazing Richmond Hill resource.

Regards.

Ramy Ghattas
Co-Founder & Director

Phone: 905.604.8445

Email: info@logicsacademy.com Website: www.logicsacademy.com

Address: 700 Denison Markham ON L3R 5E4



#### 16.5 LETTER OF SUPPORT – DAVID M. DUNIAP

## 983 19th Sideroad King City. ON L7B 1K5

A Message to the Town Council of Richmond Hill:

For many reasons I am really excited about the prospect that the York Region Astronomy Association might have the opportunity to continue the wonderful work they have been doing at the Observatory for the past few years. To be successful any non-profit organization which depends on the horsepower of its volunteers to fulfill its mission must be certain of the true interest and commitment of its members. About that notion there can be no doubt as it relates to this group. The record of their commitment is there for all to see - the lectures, the children's programs, field trips, Star Gazing nights, and on and on. But beyond that, the prospect for expanded educational programming is both enticing and exciting.

A large part of the thrill of these programs comes when an opportunity is presented to see the Great Telescope in action. At 81-years old it has its little quirks and as with any large and complicated piece of machinery it requires on-going tender, loving care delivered by those who know it best. The combined operating experience of many of the YRAA members is a truly unique and fortuitous asset which the Observatory can rely on.

How fortunate the Town of Richmond Hill is to have such an impressive team already in place to keep this important educational institution alive with energy, bringing the science of astronomy to the doorstep of so many people. This is an opportunity which cannot be passed by.

Yours very truly,

David M. Dunlap February 9th, 2017.



#### 16.6 Letter of Support – Nicole Mortillaro

October 4, 2016

To Whom it May Concern:

Nine years ago, I moved to Richmond Hill. Having grown up in York Region, I was thrilled to be moving so close to the David Dunlap Observatory, a place where I had had my first glimpse through a telescope. I was awestruck and fell in love with the observatory.

However, in 2007 when I moved just blocks away from the DDO, I was deeply saddened to discover that the University of Toronto had put the grounds up for sale. For some time, I would wander up to the premises wondering what the future held for such an historically important instrument, one that provided not only myself, but also many others with their first views of the cosmos.

On one of my forays to the deserted premises, I heard a truck trundle up the driveway. Since I knew the grounds were closed, I was shocked to see someone in a vehicle. The man in the driver's seat rolled down his window and told me that the premises would soon be to the public. I was thrilled.

For years, I tried to volunteer as much as I could, together with countless others who threw themselves into the operation of the observatory, providing education outreach to not only the town, but others who came from far and wide. I watched as these people operated the telescope, and was fascinated with the care and ease they exhibited.

For seven years, I saw the public nights rapidly increase in popularity. The community was deeply engaged with what they learned, and the telescope operators were pleased to offer any information they could. These full-time volunteers threw their hearts and souls into what they did and it showed.

Personally, the DDO has meant a great deal to me. It's not hyperbole when I say that it changed my life in so many ways. And I'm sure it has changed the lives of many others. I want to see it continue to operate in public outreach; I want to see the lives of others influenced as was mine.

If the Town of Richmond Hill wants to continue with the success of these public nights, it needs the expertise of those who have been doing it for the past seven years — and these are the members of the newly formed York Region Astronomy Association. These are the people not only with the passion, but those with the only skill-set that can keep the telescope operational.

Sincerely,

Nicole Mortillaro (nmortillaro@gmail.com /416-882-7640)



#### 16.7 Letter of Support – Kersti Meema

Kersti Meema is a presenter for Scientists in School, a charitable organization that strives to engage and excite students in STEM (Science, Technology, Engineering and Mathematics). She is a former secondary school science teacher with over 25 years of service at Thornhill Secondary School. She founded and for many years was actively involved as teacher-mentor for the astronomy club of the school, as well as being involved with other extracurricular science programs. Kersti is an enthusiastic amateur astronomer who has facilitated numerous outreach activities at the David Dunlap Observatory over the last six years. In particular, she was a presenter with the Skylab program and enjoyed sharing her passion for astronomy with the public by providing views of the night sky through her telescope on the lawn of the DDO.

Ever since beginning my involvement with the David Dunlap Observatory and its programming almost six years ago, I have constantly been amazed at the dedication, knowledge and the time commitment put forth by the volunteers at the DDO. This group has now come together to form York Region Astronomy and I believe should run the astronomy outreach at the DDO.

In the past, any activity at the DDO always had multiple volunteers: one or two telescope operators and several others for facilitating the smooth running of a program, in addition to those directly involved in presenting the program. The programs were many and geared to a variety of groups: the general public, families, Guides, Scouts, school groups and others. I have learned so much there as a volunteer and as a participant in workshops ranging from astrophotography to telescope maintenance.

It is this group that has encouraged and supported my growth in the field of astronomy. Many of the DDO volunteers regularly give up Friday and Saturday nights, in addition to other days and evenings, to share their passion for astronomy with others. There are so many people, both adults and children, who have had their interest in astronomy sparked or rekindled due the exceptional work of the volunteers.

It is this group of dedicated volunteers who I would like to see continue the programming at the DDO.

Kersti Meema



# 17 LETTERS OF SUPPORT – DDO VISITORS

Almost 30,000 visitors have experienced the enthusiasm and passion for education that marks the work of volunteers who are now members of the York Region Astronomy Association.

Below is a small sampling of their comments, received in February, 2017.

My husband and I, and our 11 year old son visited the DDO twice in the summer of 2016. Our first visit was for Space Day in May. The 2<sup>nd</sup> was for Family Night in July. We were treated to highly informative and intriguing programs, including the amazing surprise of real-time communications with astronauts on the ISS International Space Station!

We came away in total awe that such a significant astronomical legacy-landmark exists right here in the region where we live. We felt very lucky that it has been kept in such excellent working condition, and that it is actually made available for tangible public access and education.

In addition, we were absolutely blown away by the level of technical expertise, dedication, AND thoughtfulness of the people (who are actually volunteers), who maintain and run the operation, and who developed and presented the wonderful public programs. We could see from faces of the numerous young people attending that they were incredibly inspired by their DDO experience. In our opinion, our DDO experience even surpasses that of the OSC Science Center.

Needless to say, we are concerned about the preservation of the DDO. We hope that it will continue to be well maintained, and actively contribute to the education and inspiration of our future generations.

As the RASC of Toronto has decided to discontinue its involvement in the care of the DDO, it was a relief to hear that the YRAA-York Region Astronomy Association, formed from the group of former DDO-focused RASC members, is offering to step up and take on that role. We feel a need to express our support for the YRAA and our belief that, based on its members' track records in the care and management of the DDO in the past, the YRAA will continue to do the great job they've been doing all along, and continue to develop more excellent public outreach programs at the DDO.

Sincerely,		
Y. Lam		

# **DAVID FRUITMAN**

I'd like to tell you a little about my family's visit to the DDO during the Fall of 2015. We thoroughly enjoyed all aspects of our visit, including a wonderful lecture by the head of the Royal Astronomical Society of Canada and a tour of the building housing the large telescope. We particularly enjoyed roaming the grounds and looking through the various telescopes brought on site by a number of amateur



astronomers from the area. And of course, peering through the lens of the large telescope was a huge thrill for all of us!

My family had lived in Richmond Hill for 13 years before visiting the DDO that Fall. Even though I had heard of it, and was intrigued by the thought of a large observatory so close to home, I had never visited. My first experience with the DDO was extremely positive...while out for a summer bike ride in 2015, I found myself making my way to the observatory. I was absolutely blown away as I rounded the corner and the domed building came into full view from behind a stand of trees. It was certainly an amazing sight and quite surprising to me as the dome was never visible from the street.

I was fortunate enough to come across a volunteer who was in the process of cleaning up the administrative building. When she learned that I had never visited before, she took the time to give me a short, personal tour of the observatory. I was impressed not only by her deep knowledge of the observatory, but also by her friendly and casual manner. She mentioned the observatory hosted special events and I vowed that I would return with my family to show them this hidden gem so close to home.

My family enjoyed our first visit so much that Fall that we said we'd definitely come back the following year, particularly since my older son couldn't join us on the first visit. I was quite disappointed when I was unable to sign up for any special evenings at the observatory and then I learned that these special events were cancelled.

I cannot commend the volunteers I met in my two visits to the DDO with high enough praise. The events were top notch and I really got the sense that the volunteers thoroughly enjoyed sharing their vast knowledge of the observatory and of astronomy in general. That combination of expertise and enthusiasm is rare and hard to reproduce.

I very strongly hope that the existing group of volunteers can continue to be involved in the DDO and will be allowed to share their knowledge and passion for astronomy with the public for many years to come. Every month that passes without special astronomy-related events at the DDO means another group of impressionable kids loses out on the opportunity to learn from experts and be exposed to something magical.

David

#### Victoria Fisher

I'd like to strongly register my support for the group-now known as the York Region Astronomy Association--that has been ably running the Dunlap Observatory since its 2009 transfer from the University of Toronto.

In the summer of 2015, I attended an event at the Observatory which included a fascinating lecture from a respected astronomer, expertly guided viewing through multiple telescopes owned by volunteers, a tour of the main telescope, and a chance to gaze through it—a unique experience!

The evening was enchanting, and handled with great professionalism and competence. I have only praise for my experience. Although it is not easy for me to reach the area, I am very eager to return. My impression was that the organizers cared deeply about the past, present and future of the telescope and



the lands surrounding it. Their passion for and knowledge about this important Canadian landmark was evident in the quality and delivery of the programming offered.

Such expertise and passion is rare and irreplaceable. – Victoria Fisher

#### **Laurie Gerald**

I would like to comment on my experiences at the David Dunlap observatory...

I had never been to any sort of stargazing event before and knew little about the solar system outside of what I learned in school so when a friend suggested it I agreed. I had no idea of what to expect.

We were very early and only a few of the volunteers were there when we arrived, but they were welcoming and answered all kinds of questions from us while we waited for everyone to arrive. While I have never been a science buff, I found the lecture by the guest speaker interesting and made note of a couple of things I wanted to read more about on my own time. The tour of the actual observatory was fascinating and climbing up the ladder and looking through the telescope was an amazing experience.

Afterward, people had set up their own telescopes on the lawn and everyone had the opportunity to see and learn more about the constellations and the telescopes themselves. My lack of knowledge was not an impediment to enjoying the evening whatsoever. People were happy to talk about their favourite subject and teach a novice like myself. It was fun to be included so readily in the group — so much so that my friend and I bought tickets and returned for another session a few weeks later.

I sincerely hope it is possible to keep the observatory open in this manner for the public to learn and enjoy for many years to come. - L. Gerald

### **Daniel Nurgitz**

My family and I visited the DDO during one of the family nights put on by volunteers. We found the talk about constellations very interesting and thought that the star software was presented to the group in a really well-organized and fun way. Visiting the actual telescope was the best part of our visit. It was really neat when the volunteers showed how it could be positioned and rotated to view different parts of the night sky. I was amazed to hear how old the telescope was and how the different components were shipped to the site. Although it was raining that night and we could not look through the telescope, the staff told us we could come back on another night when the sky was clear.

I look forward to bringing my family again to the DDO. It's worth visiting and re-visiting.

Thank you to all the DDO volunteers, please keep up the good work!

Daniel Nurgitz



# Pollyanna Herrera

Please find below my comments in regards to York Region Astronomy Association & The David Dunlap Observatory.

As a child, I used to go to the McLaughlin Observatory in downtown Toronto. I was so disappointed when that had shut down, until I discovery the David Dunlap Observatory and their amazing volunteers. I have attended numerous Star Talks, Family Nights and the Intro to Astronomy 6 week course that was offered in 2015.

The work and efforts from the York Region Astronomy Association, has not gone unnoticed by the community. I have always had a love for astronomy and since discovering this observatory, I made sure to extend my love for space to my 7 year old son. He has enjoyed the Family Nights and being able to view the planets and the moon from a telescope, rather than in a book. This time spent at the observatory is something that my son and I look forward to every season; it has sparked an interest in him that I hope to develop.

I hope that the City of Richmond Hill continues to work with the York Region Astronomy Association for the David Dunlap Observatory. I couldn't see any other group that could handle this extraordinary place, like they have.

Pollyanna

# Manojkumar Gummadidala

We visited Richmond Hill Observatory 2016 Summer along with me and my friends family. The day arrived when we were to visit, and I was in two minds if at all it was worth visiting. Weather could have been spoil factor. But to my luck weather was fine.

What we saw there was incredible people with passion in astronomy, with various telescope parked outside and a big old one in the dome. We were given presentation on astronomy as to how we can understand them like a city's map, different terminologies, and procédures as to what we could do that day.

Then we headed to a large Telescope watching Jupiter and its breath taking. Outside the lawn we could see Moon, mars, jupiter, saturn, diffferent stars, and how to recognize stars in the sky with a map you can point in the sky.

Besides this there were bunch of volunteers waiting outside to explain in detailed about astronomy and answer any silly and stupid question. I only thought only passionate people could have explained to us otherwise we would have read so many books. My kids were excited.

From my childhood, spirituality and astronomy interest me, with an age old unanswered question how did all this get created. I am an enthusiast watching videos on astronomy and stars. I wish the technology could improve in future to give a glimpse of space travel. I feel I gained more than that I could pay in my last visit and whole heartedly wish you will manage the facility.

Manoj Gummadidala



# **Rajesh Mistry**

I, my wife and two son visited the site last year. The whole experience is very amazing, could not believe that we have this Telescope here in town. The whole tour was very informative and learned a lot. The big big surprise was to see Mars with our naked eyes. Wanted to revisit but it was all booked and will have wait for next year, feeling so sorry.

Count on our support for this.

Rajesh Mistry

#### **Amelia**

I'm writing this in support of the York Region Astronomy Association. Our trip last summer (2016) My husband took me as a surprise. He bought the tickets online and they were inexpensive. Great date night!! Driving up to the telescope was amazing! You come around the corner and there it is in the field. I was so excited!

The experience we had first meeting with the volunteers/members who had their own telescopes set up AND let us use them was a great experience. They were so friendly and so very helpful. They really know their stuff and were willing to answer questions as well. The class information part was very interesting, we learned a lot! And then going up to the tour of the telescope itself was amazing.

Overall a great experience, very knowledgeable staff, answered our questions. Even though it was a cloudy night and we did not get a chance to view through the telescope, we were told to keep our tickets to come back on another night, which I thought was great, so we didn't feel like we missed out. So I would definitely go back and I hope this team continues this program.

Amelia and Art Vente Ajax, Ontario

#### Saurabh Vaish

We visited the observatory last year and it was a spectacular evening for us and especially for the kids, they had never seen such a big telescope before. We came with lots of friends and everyone wanted to visit again, hopefully we'll come again this year.

Thank you

Saurabh



#### **Peter Tam**

It was two years ago, for the first time in my life that I was actually looked at the faraway stars through the big telescope via the friends and family night program run by people who are now part of York Region Astronomy.

Please provides more of these amusing programs more frequently so that, we, the old man can have more chance to fly with those faraway stars in our imagination, even though I have very little knowledge about the sky and the deep space.

Thank you York Region Astronomy.

Peter Tam

#### **ERIN HATTON**

I am writing to extend my support to the York Regional Astronomy Association's continued role in programming at the David Dunlap Observatory.

My family has participated in the unique family programs offered at the observatory for the last three years, since my son was five years old. The programs have been wonderful for all of us and has been the foundation for many of my sons interests in science and mechanics, thanks to the dedicated volunteers who have always been great at explain things to kids and adults, of all ages.

I can't say enough good things about the passionate and knowledgeable volunteers that have led both the administrative side and program delivery side. Their passion has been the reason that we continue to visit each year. These nights at David Dunlap have been some of best programs we have participated in the city, and I always recommend them to friend (with or without kids).

I hope that these programs will be accessible again soon at DDO.

Sincerely,

Erin Hatton

### S. Hasan

Last summer we had a chance to visit the David Dunlop Observatory and had a wonderful evening. The staff and volunteers were wonderful and very welcoming. There were quite a few kids present who were eager to learn more about the space and planets. They had a great time making space crafts with the help of some very patient volunteers. :) There was something exciting for everyone. Overall it was a very nice trip and we all learned a lot.

Sarah



#### Z. Romic

I have been visiting the David Dunlap Observatory multiple times per year ever since I found out that it was open to the public on certain nights. The lectures are informative, and looking through the big telescope is truly awe inspiring, not only for myself and my children but also adult friends I've convinced to purchase tickets with me (some of whom had no previous interest in astronomy).

Even the smaller telescopes out in the yard are worth the modest admission price, and the volunteers that keep it all going are awesome!! Every Spring I anxiously await the release of the new season's schedule of lectures and events at the observatory, and cannot wait for the 2017 line-up.

Sincerely,

Zeljko Romic DDO Enthusiast Toronto, ON

#### Jennifer Lee

My huspand and I attended a stargazing event at the David Dunlap Observatory in the summer of 2015.

We really enjoyed our trip, including listening to the guest speaker talk about the moon landing and looking at the stars through the various telescopes on-site. The volunteers were very welcoming, knowledgeable, and helpful. We also appreciated how insect repellent was made available to us free of charge.

As citizens of Toronto, we are grateful to be able to access such as wonderful facility to gaze upon the stars. We were actually on the lookout to attend more events, especially those during meteor showers where we can have a space away from city lights to star gaze. To access a light-pollution free zone, we usually would have to drive very north to secluded areas. We hope to visit again in the near future.

Peter Pan and Jennifer Lee

# **Dan Logan**

My girlfriend and I visited the Observatory last year and took in a lecture on the New Horizons Pluto Mission. We enjoyed the lecture and the tour of the observatory a great deal and it would be an absolutely shame if this was no longer an option for a fun, intellectual night out. The speaker was incredibly knowledgeable and so clearly passionate about the subject matter than he went well over the allotted time. The group was engaged from beginning to end, and we have since recommended the observatory to many family and friends.

To the York Region Astronomy Associate, thanks for all your work and best of luck with everything moving forward.

Sincerely, Dan Logan



# J. Salluji

My family and I have been regular visitors to the observatory for many years and each time we visit we are in awe with what we see and learn about our universe. Both the adults and kids.

The facility is one of a kind and we don't need to venture too far to be able to appreciate our universe. The volunteers are knowledgeable, energetic and a great resource.

The history behind the observatory is interesting as well and very special - let's ensure we take care of this facility for many more years ahead. This observatory is one to treasure!

Thanks, S.L

#### Adam and Milena

I visited the David Dunlop Observatory with my husband last year and was amazed by the scale and state of good preservation that the observatory was in. The presentation preceding the tour succeeded in being informative while being relatable even for someone like myself who does not have an astronomical background. The speakers were knowledgeable and approachable and gave an insightful presentation. The observatory tour was a unique experience and I am looking forward to returning this year. During our visit, many amateur astronomers were set up around the property to observe the night's event, which created a welcome sense of community. I was happy to learn that the observatory organizes school trips and community events for those interested in learning more, all run by volunteers. The peak of our visit, being able to peer through the largest telescope in Canada, was something really remarkable! Last but not least, the architecture of the building was beautiful and well preserved, the property was well maintained and everyone had a smile on their face.

Thank you for a great experience! I have referred many friends who had not heard of the observatory and they were all equally impressed! I hope this hidden gem will continue to be easily accessible for those who want to visit.

Milena

# **Ruby Dallas**

I am writing to express my support for the York Region Astronomy Association in their effort to continue the conservation and caretaking of the David Dunlap Observatory. My partner and I visited the David Dunlap Observatory for the first time this past summer. We had tried to go a couple times, but it was often sold out – which of course speaks to its popularity.

I am a complete "space nerd" and my partner slightly less – but even so we had a brilliant time. We learned, we laughed and we got to witness a piece of living scientific history, still functioning and well taken care of. The volunteers at DDO are evidently beyond passionate about what they do, they had humour and so much invaluable knowledge.



It would be an enormous shame to not have the DDO run as it has been with the volunteers, as my family is hoping to make a pilgrimage to the DDO a yearly tradition. (My partner and I joked about getting married there, but one of the volunteers replied: no weddings!! To which we had a hearty chuckle).

Please continue to allow this wonderful beacon of Canadian scientific history to thrive through the care of the people (volunteers) who have an invaluable knowledge of it and deep passion for it.

**Ruby Dallas** 

#### **Andrew Wells**

Last year I bought two tickets to the David Dunlop Observatory Star Talks series for my partner on Valentine's Day. We went to the observatory in July and had a truly amazing night. We learning a lot about the sun, moon, and stars, but more importantly we had a very enjoyable night. In addition to the observatory, which was an unforgettable experience, there were local astronomers with their telescopes offering to show us the night sky. Having a chance to speak with these passionate and knowledgable individuals really inspired us to take up star gazing and continue to learn more about space.

We have recommended the observatory and the Star Talks series to anyone looking for a unique and engaging night. We hope to return to the observatory soon and I am sure we will enjoy it just as much the second time.

**Andrew Wells** 

# From: Carlo Arteficio

I've been to the DDO several times and I am still shocked at how I never knew it existed given how much I enjoy "space". Each time I've gone, I've always wound up with things that I will never forget like seeing the rings (plural) of Saturn (instead of just a single ring) and its moons, the ISA flying overhead, binary stars like Albireo, and far away galaxies.

I've especially enjoyed it when I got to try the different telescopes that volunteers have brought which inspired me to buy my own telescope.

Thanks for keeping the interest in the stars alive and for inspiring people like myself to look forward to the future.

Carlo

#### **Adrian Feudale**

We have visited the David Dunlap Observatory a few times in the past - the most recent was to observe a twin-star system through the telescope.



Every time we visit, we are amazed how many people are in attendance of all ages. Children seem very impressed with all of the activities and learning that is happening at the DDO and I'm sure some are future scientists and astronomers in the making.

The staff and volunteers are always very friendly and knowledgeable and we thoroughly enjoy our time there.

Adrian

# **Reinhard von Guttenberg**

On a clear summer night two years ago, my wife and I visited the observatory during one of the Dunlap Friends & Family Nights together with our granddaughter. We had a chance to look at planets and stars through the large telescope, as well as listening to a presentation in the Skylab, and discuss and view the night sky with the many enthusiastic amateur astronomers on the observatory grounds.

It was a great experience for us that we want to repeat in the future, and we hope that the Town of Richmond Hill will keep and maintain this unique observatory, to provide further generations in the GTA with a chance to learn about the basics of astronomical observations at this historical site.

We appreciate the work by the group that has been looking after the observatory since it was sold by the UofT, and are happy that the York Region Astronomy Association has committed to act as stewards of this landmark.

Reinhard von Guttenberg

Over the past few years my family, which includes my star loving 12 year old son, has been very fortunate to visit the David Dunlop for star observations. The experience at the Observatory is an important highlight of our family adventure. It is a memory that we hold dear and will continue to draw upon in our regular routine.

It was at the Dunlop Observatory that we learned to track the International Space Station. We also learned when to search the night sky for many galaxies and favorite planets. The volunteers at the observatory were extremely helpful to a curious child. Not only are they passionate about stars, but they were able to create a desire in my entire family to learn more about astronomy. We were invited to visit any location the volunteers set up their telescope to view and learn more anytime.

The most important memory for me in our visits to the Observatory was seeing M5 through the giant telescope. This was my first time seeing this jewel outside a photograph, I was very impressed!

I hope the David Dunlap Observatory will continue to offer this type of information and will continue to influence the children and adults in the future.

Winsome Julal



# **Carrie McGregor**

Our family visited the Observatory for the first time last summer and had a delightful evening.

Organizers were welcoming and engaged with visitors. We learned so much from the knowledgeable volunteers. It was very cool to get into the main building and have an opportunity to look through the telescope. Beautiful grounds and building—a lovely setting for taking photographs. Overall a wonderful experience.

Thank you!

#### **Linda Chiasson**

I brought my mother from Ottawa to see the Dunlap Observatory. She tells me it was one of the best days of her life. I feel the same.

The volunteers are wonderfully welcoming and enthusiastic. They're eager to share their knowledge and they communicate their energy and excitement to visitors. I can't imagine anyone but volunteers feeling this joy every day, because it's not merely a "job" to them. That cannot be replicated. They are much needed!

Linda Chiasson

#### Irene H

Subject: Love the work that York REgion Astronomy Association did for Observatory

Visited David Dunlap Observatory. Can't imagine we have such a fascinating facility, a hidden gem at our backyard! The York Region Astronomy Association volunteers were totally amazing. The talk, the experience that they provided were eye-opening. It was an amazing night for my family, especially my little girl. The volunteers were so nice and so knowledgeable.

Really appreciate it!

# **Gaspare Di Salvo**

Our family discovered the David Dunlap Observatory a few years ago and we really enjoy planning a few outings every year! The kids love Family Night, the fresh summer night air, and the grandeur of the giant observatory that lets us gaze at the bright stars and mysterious planets. It really is an exciting event for us at such an affordable price.

The staff and volunteers are super friendly and their passion for astronomy shows in the stories and the knowledge they share. It's also nice to interact with everyone who sets up their personal telescopes on



the lawn and lets us take a peak at what catches their interest that night. The Observatory is truly a hidden star that lets us escape everyday stresses of life and it needs to be preserved and promoted so future generations can enjoy it.

G. Di Salvo

# **Hassan Masoudpour**

I appreciate your support and volunteer group in keeping DDO alive for all visitors. We really enjoyed our visits during family events. We already visited other places to look at the stars but we like the environment of this place especially its friendly staff.

Hassan Masoudpoor

#### Chelsea Allman

A group of us visited the observatory for the first time last year and did not know what to expect. We were blown away be the passion and dedication the York Region Astronomy Association has for the DDO and their love of the universe. We hope to go back again this summer to further our knowledge of the stars!

Good luck!!!

#### M thompson

I would like to thank the Dunlap Observatory and all of its volunteers and staff. Back on August 27th, 2016, we decided to do a 'stay-cation' and visit the observatory. For me, going to the observatory was on my bucket list. And most importantly, being a mother of two girls, I wanted to show them the possibilities of science exploration.

The crew on that day were amazing! Very knowledgeable and so friendly. You could tell, they loved being there.

That night had a huge impact on my family. My 10 year old said that she wanted to be an astronomer. And the next day, we bought a telescope. The influence of the observatory and its representatives is priceless!

Please know having the Dunlap Observatory open to the public is a gift for everyone. I hope that whatever decision is made, it is for the best, for everyone.

M Thompson

#### **Mark Tannous**

Our visit to the DDO was such a great experience. Having the opportunity to listen to a guest lecturer, view the Observatory, and gain an understanding of its history made for such a memorable evening. The passion that the individuals at the observatory have towards astronomy and volunteering their own time



to show visitors outer space from the lens of their own telescope, speaks to the dedication of these individuals. This is what makes the Observatory a special and treasured space. The passion of the individuals is what makes people not only enjoy going, but also keeps them coming back. The York Region Astronomy Association's support of the Observatory is a testament to the prominent place the Observatory holds in Richmond Hill.

Lillian Chalabi and Mark Tannous

#### **Rachel Cremonese**

We have visited the DDO the past two summers on family night to enjoy an educational and fun evening with the stars. The events are well very organized and enjoyable for families. The passion of the astronomers is contagious and gets everyone engaged and enthusiastic. Everyone is so welcoming even the astronomers sharing their telescope on the lawns. Truly a great historic landmark!

# Lydia Sidharta

We visited the Observatory last summer of 2016, listening to a speech, visited the biggest telescope inside the observatory and also we were able to watch the stars through the small telescopes that were set up outside.

The speech and presentation were phenomenal, they were very informative, especially for us who listened and watched for the first time. The big telescope itself is amazing.

We managed to see some stars through the smaller telescopes. Having said all of these, certainly we would like to visit the observatory in the future. The event was fully booked, lots of people were there especially the younger generation.

We would like to support the York Region Astronomy Association all the way. So please keep up the good works!

Regards, Lydia Sidharta

#### **Goutom Datta**

My wife and I have been to the observatory 2 times in 2015. During both events, we were in awe of the facility and the kindness of the staff. At the time, my wife and I were dating and this was a great place for both of us to experience something new. We're married now and are looking forward to bringing our kids to the observatory in the future.

Goutom	



# Mary Jo Ducharme

I just wanted to send the following testimonial about our visits to the DDO.

For several years now we have been bringing our children to the excellent events hosted at the David Dunlap Observatory. A special highlight has always been the Halloween events, however, we have come out for many Star Talks and evenings of viewing with the large telescope.

We feel so lucky to have access to the large telescope and to have the physicists and other scientist volunteers on hand to explain things to our scientifically curious children (and to us). My children will never forget the first time they saw Saturn with its rings or the first time they could see the line between the light and dark side of the moon.

The GTA is so lucky to have the DDO and the generous people of the York Region Astronomy Association. They really understand the importance of sharing scientific knowledge with the community. Thank you!

#### anna orodi

Hello YRAA!

A quick note of thanks for all the years you offered Summer Lectures at the DDO.

As a family, we looked forward to attending the lectures and felt comfortable to ask any question. It was obvious the speakers were eager to share their knowledge. Visiting the telescope was exciting. The lawn was always full of available telescopes and eager astronomers wanting to help us learn.

Thank you to you and your amazing volunteer team for keeping the observatory alive during those summer visits.

We hope to visit again and hope to see you soon.

Peace

Anna, Tom and Natalie Orodi



# FROM THE GUIDE AND SCOUT COMMUNITIES

# **Josephine Wray**

Hi Diane,

I really do believe the service you offer was fantastic and could inspire future budding Astronomers. I believe the facility has great historic value and can continue to help educate kids and adults alike.

Our group was very fortunate to go there on that particularly cold winter evening since in addition to learning about the observatory and space, we were shown the international space station passing by.... something that even I didn't know about and wouldn't have known where to look even if I did know.

I wish you all the best of luck and hope you are able to continue to act as stewards for this landmark.

**Best Regards** 

Josephine

# **Jenn Dickson Tooley**

Thanks again Diane and Rajesh, and to Michelle and Paul also. What a fantastic evening! I am so happy that the sky was clear as I had been stressing all week looking at the weather forecast. Even Friday it had been calling for snow in Richmond Hill on Saturday evening and I was so worried. But then when I checked first thing Saturday morning, I was almost jumping with joy at the forecast for clear skies.

From what I heard, the kids were mostly asleep on the way home; I imagine a number of them will be very tired today:-) I heard from one of the parents of the scouts who was texting home from the car that he was very enthused about the entire experience.

I wish I had had more time to stay and visit, and really check out the observatory! So much I didn't see because I was trying to keep track of kids ... So I'll just have to come back another time!

One of the parents who came is a brownie leader; so she may be bringing some girls by. Another leader is also with Scientists in Schools so she was thrilled to join us and I suspect she and her family will be back for a public tour over the summer. And one of my cubs (the one who asked a great many questions and was sitting up at the front) is at a Montessori school and likes to organize outings, so he's going to do a report at school about last night. Hope to see you both again soon!

Jenn



# 18 ARTICLE: VIEWPOINT MAGAZINE | FALL 2016











a kid, Ed was a space buff. He was a regular visitor to the planetarium and watching meteor showers was a favourite pastime. He attended Saturday morning space programs at the Royal Ontario Museum, read as much science fiction as he could, and happily called himself a space nerd.

Ed also quickly developed a passion for theatre. The stage was calling him throughout high school and when the time came to pick which path he would choose for his post-secondary Journey, it was a tough decision. Science won out and he headed to McGill University to pursue a Masters in Paleontology. He then did additional graduate studies at Dalhousie University in evolutionary developmental biology and amphibian evolution and functional morphology. Next up was the Ontario Institute for Studies in Education for a teaching degree (though he would continue to keep his foot in theatre for many years to come).

It was only after returning from a teaching opportunity at Neuchâtel in Switzerland that a new chapter in Ed's space odyssey began. While waiting to move into his new home, he caught a terrible bug and was bedridden for two weeks. His wife Laura bought him an astronomy book. "All our material goods were packed away so I literally read that book front to back for hours." Space and the stars were officially back on his radar.

ABOVE: Ed Hitchcock's telescope is mounted in a Skyshed POD (Personal Observatory Dome). The dome lid opens for observing and imaging the night sky.

Two years later, his dad got him a membership to the Royal Astronomical Society of Canada (RASC) which led to getting his own telescope. Never one to do anything halfway, Hitchcock set up his own observatory at his cottage where he spends hours taking in the wonders of the night sky.

#### Taking it to the next level

As far as hobbies go, Ed's stargazing passion was pretty robust already when a unique opportunity presented itself. The RASC took over the David Dunlop Observatory at the University of Toronto in 2009. The observatory is home to one of the largest telescopes in the country. For several years, the society worked on a plan to allow the public to have access to this amazing piece of technology. It needed trained volunteers to help run special programmes and event nights at the facility. Ed was chosen to assist and is now one of the few elite operators in Canada.

Watching Hitchcock talk about the telescope and all the possibilities science has to offer makes it easy to imagine what it's like to see him in action teaching astronomy as part of the grade nine curriculum. He brings in personal equipment and gadgets from home. Pictures of his cottage observatory and the Skyshed his telescope is housed in are also part of a typical class. "I've always loved science so I get a charge out of seeing students getting turned on by it as well," Hitchcock said.

One of his students spent this past summer volunteering at the David Dunlop Observatory thanks to a field trip he organized. "That says to me the enjoyment of the subject matter is being transmitted to the next generation."

That subject matter is not simply covered in one grade nine class. Ed says astronomy can be found in many other areas of learning. "Astronomy is part of chemistry when you're talking about the process of nuclear synthesis and super-nova explosions. Telescopes are part of the optics unit in grade 10 science so whenever there's that spill-over, I get kind of excited. It's hard to hide that."

Enthusiasm for a topic is something teenagers easily pick up on. Hitchcock says his students know that space is his thing. "It's like in elementary school when you bump into your teacher at the grocery store and realize they live outside the school. When you talk so much about a hobby or area of interest, kids start to get the sense you may do things outside of the classroom."

It's been almost 17 years since Ed arrived back from Switzerland and read that astronomy book front to back. A few months later he arrived as a teacher at Bayview Glen. There's been so much change, he says, it's hard to even picture the school back then. One thing has stayed the same: his passion for teaching. "When those light-bulb moments happen for the student and their Jaws drop because they make the connection, that's why I teach. I love it when they latch on to science and develop the enthusiasm I feel."

Theatre is still part of Ed's life, biology is never far away, and his personal telescope gets a regular work-out. But if you're trying to track him down, you might be just as likely to find him manning one of the country's largest telescopes. Exactly where you'd expect to find a self-proclaimed space nerd. 

▼

VIEWPOINT FALL 2016 | BAYVIEW GLEN



# 19 ARTICLE: ACORN, ARCHITECTURAL CONSERVANCY ONTARIO | FALL 2016

# The David Dunlap Observatory

# A centre for education and public outreach

by Karen Mortfield

Opened in 1935 as a cornerstone of astronomy education, the David Dunlap Observatory in Richmond Hill, Ontario, was the culmination of a long, arduous journey.

It was the dream of Dr. Clarence Chant, who was the University of Toronto's first (and for many years its only) astronomy professor.

In 1907, he began offering public lectures and talks, promoting the idea of a world-class observatory for Toronto. Year after year he taught the first generation of Canadian astronomers, fitting in public talks and interviews whenever time permitted.

However, it wasn't until 1921 that he attracted the attention of mining executive David Dunlap, who seemed interested in funding the grand scheme. Mr. Dunlap's untimely death in 1924 left the plan in limbo. Dr. Chant persevered, and in 1926 approached David's widow, Jessie Donalda Dunlap, to discuss building an observatory as a memorial to her husband.

Entranced by the idea, Jessie Dunlap agreed, becoming one of the first women to endow a major scientific institution. She and Dr. Chant spent long months searching for the perfect location and settled on a 72.8 hectare parcel of farmland in Richmond Hill, Ontario.

The observatory itself is a marvel of engineering in the midst of a prosaic suburban landscape. The 72 tonne copper observatory dome, 18.5 metres in diameter, rises out of the green landscape like an atomic age spacecraft. The telescope inside remains the largest optical telescope in Canada, little changed from the day it was installed.

Adjacent to the observatory, the Administration Building houses offices, classrooms, laboratories and machine shops in grand style. Andre Scheinmann, in his report to Richmond Hill Town Council in 2008, enthused:

The Administration Building is a major architectural achievement. Mathers and Haldenby successfully combined an eloquent memorial to the patron's husband, David Dunlap, with a functional administrative and research facility supporting the Observatory. Literally at its core the building integrates the sacred and scientific ...

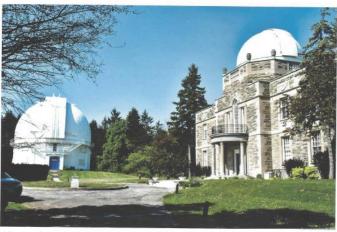
In this congenial atmosphere, the David Dunlap Observatory was the training ground for generations of Canadian astronomers. It was never easy, though. Canadian weather, both in summer and winter, left scientists with far fewer clear nights than they would like to observe the night sky.

Astronomers took every opportunity – every clear night hour – to watch and study and learn.

Dr. Helen Sawyer Hogg, one of the female pioneers in the field, produced cutting-edge research on globular star clusters and for years wrote a popular column on astronomy in The Toronto Star. Tom Bolton's careful analysis of data provided by the DDO telescope provided the first direct evidence that Cygnus X-1 was a black hole.

The university's astronomy department was housed there for many years and graduate students remember the long nights of observing while coyotes howled in the surrounding landscape.

But research interests change, equipment ages and in the case of the Dunlap Observatory, light pollution



Adjacent to the David Dunlap Observatory in Richmond Hill is the administrative building by Mathers and Haldenby of 1935. Photo Richard Longley, 2016

16 ACORN Fall 2016



from the Greater Toronto Area continued to encroach.

Faculty research needs were increasingly filled using newer, bigger telescopes located in darker locations, such as Hawaii and Chile and, of course, out in space.

Finally, in 2008, the university made the decision to sell the David Dunlap Observatory and the lands that surround it. While the sale of the site to developers was controversial, the funds allowed the university to create the Dunlap Institute.

Professor Bryan Gaensler is the Director of the Dunlap Institute, leading the next chapter in the Dunlap legacy. He says:

The Dunlap Institute for Astronomy and Astrophysics is the scientific successor to the David Dunlap Observatory, both in letter and spirit. Now based on the U. of T. campus in Toronto, the Dunlap Institute continues the vision of Clarence Chant and of the Dunlap family: to push back the boundaries of knowledge, and to share the wonder of science with the wider public. Through a variety of initiatives, including ongoing partnerships with the DDO, the Dunlap Institute is deeply committed to utilizing the latest astronomy technology to make major breakthroughs, and to train the next generation of astrophysicists and cosmologists.

As for the now 81-year-old Observatory and Administration Building, it remains in operation as an education and public outreach facility, rescued by a dedicated volunteer team. Members of the Royal Astronomical Society of Canada, Toronto Centre, have spent the past seven years maintaining and operating the heritage facility.

The volunteers offer educational programs ranging from public observing



The observatory is open for special events and educational programs today. Photo Karen Mortfield, 2016

nights and guest lectures to Girl Guide and Scout tours, special event programs and school visits. The public program nights, designed to appeal to both nonastronomers and knowledgeable visitors, have become so popular that tickets for each program sell out months ahead of time.

The amateur astronomers undertaking this labour of love are intent on providing a personal experience for each visitor, creating a series of one-on-one interactions. This approach encourages guests to feel they're part of the DDO story.

Chris Vaughan of AstroGeo: Science Outreach Specialists runs daytime school programs at the Observatory. He believes, "The DDO offers a unique opportunity for me to blend the science of astronomy with the history of the observatory. I like to tell the story of Professor Chant and the Dunlaps, and paint a picture of the world of the early 1930s - including the limitations of international travel in that era."

Chris, a geophysicist by training and an astronomy educator by inclination, says the heritage architecture and enormous old telescope have a significant impact on students, even today:

Opening the enormous shutters, rotating the massive dome, and moving with one hand the wellbalanced enormous telescope, never fails to elicit gasps of excitement from the students and teachers. While seeing the telescope and learning how it works thrills the young science students, the experience of seeing firsthand the gears and mechanisms of the engineering and design of the telescope and dome also appeals to the less academically inclined students.

The Dunlap family has publicly praised the Observatory's new role as a centre for education and public outreach, describing the outreach programs and the Dunlap Institute's educational work as legacies that would make Jessie Donalda Dunlap proud.

# About the author

Karen Mortfield is an executive consultant, providing customer care, crisis communication and media relations counsel. She has served the David Dunlap Observatory as a volunteer with the Royal Astronomical Society of Canada since 2009.

Fall 2016 ACORN 17



# 20 ARTICLE: INSPIRE ME YORK | SUMMER 2015

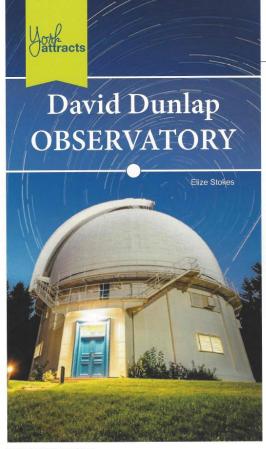


image courtesy: www.ddo.ca Photographer: Benjamin Lappalainen I blapphoto.com

Do you have a scientist in the making, a passion for the stars, or simply an interest in learning further about our infinite universe? Then look no further.

Nestled in over 180 acres of land, The David Dunlap Observatory located in Richmond Hill, is an astronomer's heaven, as it is an historian's dream come true. One can get lost in the extensive book collections, original artifacts, telescopes and other fascinating pieces in the Observatory Campus, all before visiting Canada's largest, a 1.88 metre Grubb-Parsons Optical Telescope. A telescope built in England, brought to Richmond Hill in pieces, and remounted in the mid 1930's.

Driving up the winding, beautiful road leading to the breathtaking observatory, one is left with a feeling of awe in the midst of the silence and solitude of its surroundings. After a personal tour given by Karen Mortfield, one of the hundreds of volunteers who help run, manage and operate the facility, it becomes

abundantly clear that these volunteers love what they do. The Toronto Centre of the Royal Astronomical Society of Canada (RASC) is a registered charity of over 800 volunteers, some of whom have worked tirelessly to maintain and revive the facility over the past six years. After having assumed stewardship in 2009, it has welcomed over 20,000 visitors and inspires young astronomers globally.

Originally belonging to Jessie Dunlap, widow of mining executive Donald Dunlap, in partnership with Professor Clarence Chant, the sole astronomer at the University of Toronto in the early 1900's, the observatory was donated to the university and officially opened in 1935. A haven for astronomical pursuits, advance and exploration, it marked great progress over the years, with many famed discoveries such as the existence of black holes. Unfortunately, by 2008 light pollution due to population increase and demographic changes caused the end of an era. It was sold privately and when RASC became involved in 2009 with the new property owners, the objective was to salvage the telescope and facility. With the intent to provide public and outreach programs, along with community service and volunteer commitment at heart, it reopened and is now a huge success encouraging people to learn and participate in astronomy life.

Such programs include observing the skies during meteor showers (up to 2,000 attendees); Friday Family Nights where children are encouraged to use their imaginative powers and create their own constellations and other innovative ideas while making use of the craft room, Skylab and the Great Telescope; Star Talk Nights where guest speakers such as astronomers, educators and space students provide science-friendly lectures for all. The facility welcomes Scouts and Guides, school groups, local astronomy clubs and also offers an intern program for high school students. For community outreach there is a Telescope Clinic for new telescope owners who may need help managing their newest additions, along with a Lender's Program for those interested in purchasing a telescope, but would like to handle one beforehand.

# FOR MORE INFORMATION & TO DONATE, visit:

www.theDDO.ca



Season runs from May to October, with public programs available on weekends. School tours available during the week.

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