



2006 General Assembly

May 18 – 22, 2006



Ottawa Centre Centennial 1906-2006

The Royal Astronomical Society of Canada
La Société Royale d'Astronomie du Canada



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Cover Photo: The Dominion Observatory and Comet Hale-Bopp, courtesy Doug Luoma, Ottawa Centre

Welcome

Welcome to the 2006 GA!

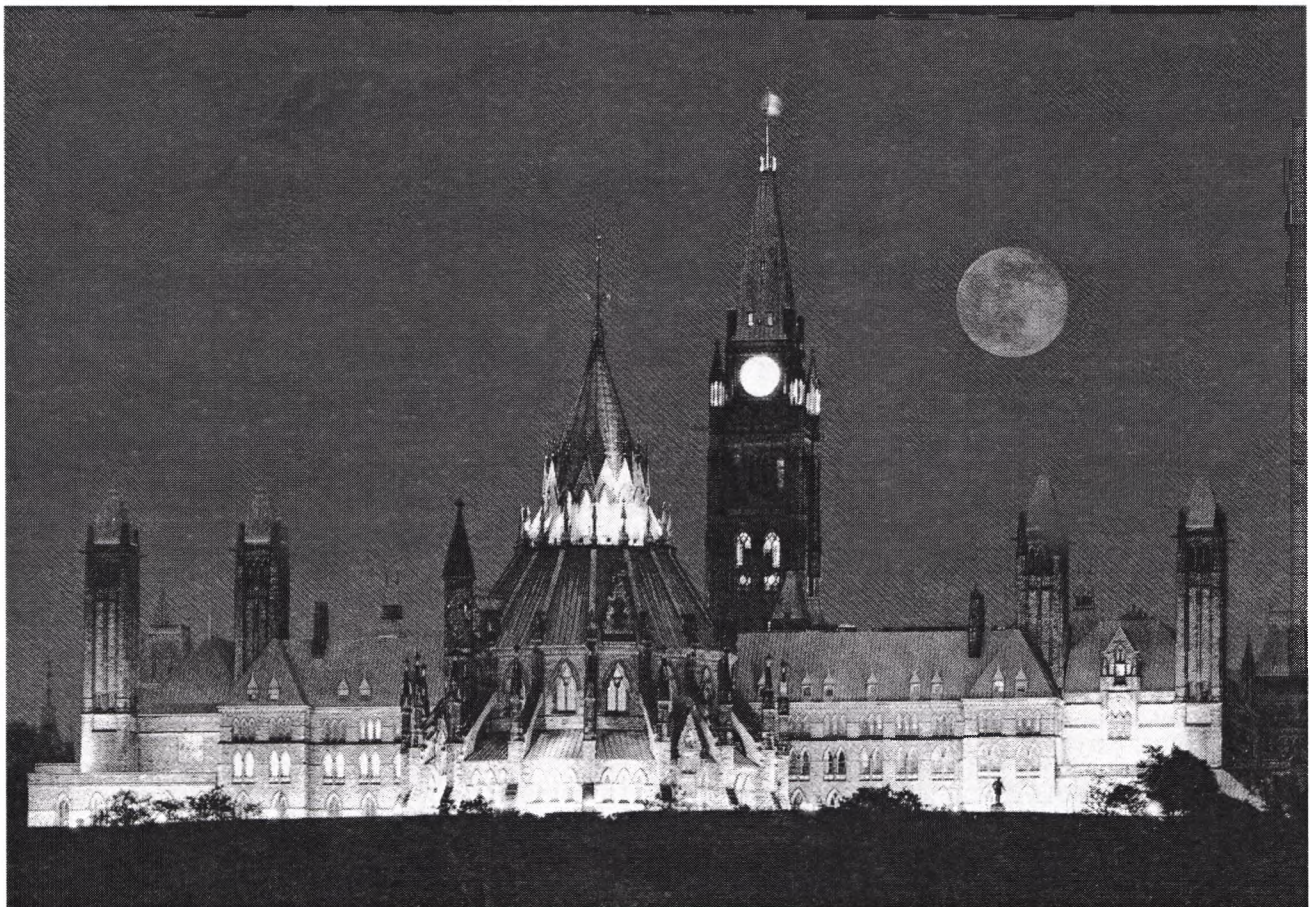
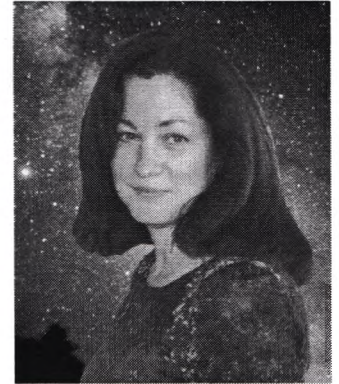
It is with great pleasure to welcome all of you to Ottawa, Canada's capital city, for a very exciting General Assembly on this Victoria Day weekend. The GA Committee has been working hard to bring together an outstanding program jammed packed with fabulous speakers, a variety of day tours, great food and lots of fun, social opportunities to see old friends again and to make new ones. I believe that you will especially enjoy the wine and cheese social evening with live classical entertainment.

The year 2006 is a special one for the Ottawa Centre as we commemorate our 100th anniversary of becoming the first Centre of the Royal Astronomical Society of Canada. What better way to celebrate it than bringing fellow astronomers together from across the country and hosting what we believe will be a very memorable General Assembly.

I hope you have the opportunity to take advantage of some of the day tours we have planned and get out to see some of the sights Ottawa has to offer – including the famous tulip festival, which is in full swing with over three million tulips planted each year.

So on behalf of the RASC Ottawa Centre, I wish you a very enjoyable GA and I look forward to meeting all of you.

Debra Ceravolo
General Assembly Chair
Ottawa Centre President



Registration

Carleton Conference Centre

Check-in for residence accommodation is at the Carleton Conference Centre, which is open 24 hours a day. It is located in Residence Commons (Building CO on map, page 15).

Check in time is 3 pm, and check out time is 11 am. Early arrivals are subject to a fee of \$15 per person. Late departures are also charged \$15 per person.

No shows are charged at the **full rate** for the first night's accommodation, and at \$20.00 per person for the balance of reserved nights.

For early arrivals and late departures, the Carleton Housing and Conference Services Department can provide secure luggage storage. Inquire at the registration desk for this service.

Registration Desk Hours and Location

The registration desk is located in Residence Commons (CO). Hours of operation are:

- Thursday 4:00 pm to 11:00 pm
- Friday 8:00 am to 11:00 pm
- Saturday 8:00 am to 10:00 pm
- Sunday 8:00 am to 10:00 pm
- Monday 8:00 am to 2:00 pm (preliminary)

Parking

Daily parking is available for a fee of \$8.00/day or \$25/week. Parking is free on weekends. Parking passes are available at the front desk or can be arranged by the Housing and Conference Service Department.

Registration Kit

The registration kit includes (in addition to this program):

- Your personalized name tag, which:
 - is your ticket for all paid-for tours, barbeque, wine and cheese, and banquet
 - includes your registration number, which you need for the banquet door prize draw
- Tourist brochures
- City map
- Pocket schedule
- Meal card
- Ottawa Centre AstroNotes newsletter
- Giveaways from sponsors and commercial vendors

Items for Sale

A variety of commemorative items are for sale at the Registration Desk, including:

- Golf Shirt, Royal Blue with Centennial logo, \$40.00
- T-Shirt, Red with Centennial logo, \$15.00
- Centennial Lapel Pins, \$5.00
- Coffee Mugs, burgundy with Centennial logo, \$10.00 (dishwasher safe!)

Local Services

Restaurants

Ottawa has a great variety of excellent restaurants. Check out nearby Bank Street, Chinatown on Somerset Avenue near Bronson Avenue, Little Italy on Preston Street, and of course the Byward Market downtown.

Postal Outlet

The campus postal outlet is in the University Centre Store (UC).

Bus/Train Service

The campus is served by the O-Train, which connects to local buses, and is integrated with local bus service. Bus schedules are available at www.octranspo.com, or call 741-4390.

Sponsors

Thank you to the following organizations for their generous financial support of the General Assembly:

Carleton University Department of Physics – Bell Theatre for Helen Sawyer Hogg Public Lecture

COM DEV International Ltd. – Wine and Cheese

Diffraction Limited – GA Program printing

Routes AstroEngineering – Coffee breaks and snacks

Door and Display Competition Prizes

Thank you also to the following astronomical product companies for their generous donations of door prizes and display competition prizes:

Company	Door Prize
Anacortes Telescope and Wild Bird	Two \$50.00 Gift Certificates
Celestron	NexStar 80mm Computerized Refractor
Diffraction Limited	MaxDSLR Imaging Software (two copies, each US \$299 value)
Imagetech-Ontario	Print of Winning Image (\$350 value)
Imaginova / Orion Telescopes & Binoculars	Starry Night Pro Plus Software (US \$250 value)
Imaginova / Orion Telescopes & Binoculars	Orion SkyQuest XT8 Classic 8" Dobsonian Telescope (US \$360 value)
Lumenera Corporation	SKYnyx CCD planetary imaging camera (US \$995 value)
Lumicon	Two \$25.00 gift certificates
Pro-Com Electronics & Telescope Repair	MallinCam
Santa Barbara Instrument Group	ST-402ME CCD imaging camera (US \$1295 value)
Sky Publishing	Millennium Star Atlas (US \$150 value)
Sky Publishing	Pocket Sky Atlas (US \$20 value)
Starlight Theatre	Colour Star Maps (five)
Starlight Theatre	B&W Star Maps (five)
Starlight Theatre	Celestial Sphere Videotapes (five)
Starlight Theatre	Astro-Imaging Exposure Calculators (five)

Schedule of Events

Time	Event Details	Location
Thursday, May 18th, 2006		
16:00	Registration Opens	Residence Commons (CO)
18:00	Informal Dinner	Directions will be given to nearby facilities
20:00	Hospitality Suite	Leeds Residence (LE) 1st floor
Friday, May 19th, 2006		
07:30-08:30	Breakfast (included with accommodations)	Residence Commons (CO)
08:00	Registration continues	Residence Commons (CO)
09:00-12:00	Astronomy Tools	Azrieli Theatre (AT) Room 102
09:00	Rick Wagner – Welcome	
09:05	Tom Kaye – Radial Velocity Detection of Extra Solar Planets by Non-Professionals: The Spectrashift Project	
10:00	Paul Campbell – Solar Radio Astronomy and a Magnetar observation	
10:45	Coffee Break	
11:00	Douglas George – Building an Automated Observatory with Off-The-Shelf Components	
09:30-17:00	National Council Meeting #1	Prescott (PH) Multipurpose Room
12:00-13:00	Lunch	Residence Commons (CO)
13:00-16:00	Astronomy Tools Workshop resumes (includes coffee break)	Azrieli Theatre (AT) Room 102
13:00	Begoña Vila – Welcome	
13:05	Tim Puckett – Running an Amateur International Automated Supernova Search Program	
14:00	Paul Mortfield – Automating Remote Imaging and Photometry	
14:45	Coffee Break	
15:00	Paul Boltwood – Developing a Highly Refined Observatory for Working with the Pros	
15:45	David Levy – Comet Hunting Then and Now: A personal retrospective of the changing methods and experiences in comet hunting	
13:15-16:30	Choice of two tours: Tour #1 David Florida Lab Satellite Testing Facility and SMARTScope Tour #2 Canada Museum of Science and Technology	Bus pick up at Leeds Residence (LE)
18:00	Human Pyramid	TBD
18:30	Barbeque and casual talks (with cash bar)	Residence Commons (CO) Third Floor
22:30	Hospitality Suite	Leeds Residence (LE), 1st floor

Saturday, May 20th

07:00-08:30	Breakfast (included with accommodations)	Residence Commons (CO)
08:00	Registration continues	Residence Commons (CO)
09:00-1200	The Future of Advanced Amateur Astronomy in the Age of Overwhelming Professional Sky Surveys – A Discussion Forum	Azrieli Theatre (AT) Room 102
09:00	Peter Ceravolo: Welcome	
09:15	Dr. Robert Jedicke: The Next Decade of Solar System Discovery with Pan-STARRS	
10:30	Coffee Break	
10:45	Panel Discussion: Moderator Peter Ceravolo, Rick Fienberg, Douglas George, David Levy, Tim Puckett, Douglas Welch	
12:00-13:00	Lunch	Residence Commons (CO)
13:00-16:00	Canadian Space Astronomy (includes coffee break)	Azrieli Theatre (AT) Room 102
13:00	Dr. Jaymie Matthews – Welcome	
13:05	Randy Attwood – The History of Canada in Space	
13:45	Dr. Neil Rowlands – Canada's Contribution to the James Webb Space Telescope	
14:30	Coffee Break courtesy Routes AstroEngineering	
14:45	Dr. Anthony Moffat – Nano-satellites for Astronomy – The Canadian BRITE Nanosat Mission	
15:30	Dr. Jaymie Matthews – MOST Exoplanet Observations	
13:30-16:30	Tour # 3 National Gallery of Canada	Bus pick up at Leeds Residence (LE)
17:00-18:30	Dinner	Residence Commons (CO)
19:00	Helen Sawyer Hogg Public Lecture Welcome – Debra Ceravolo, Ottawa Centre President Pat Browne – Light Pollution Abatement Award for the Town of Almonte Denis Laurin – Canadian Space Agency Dr. Alan Hildebrand – Hunting for Doomsday Asteroids from Earth and Space	Minto Centre (MC), Bell Theatre
20:30	Wine and Cheese with live classical music (sponsored by ComDev)	Tori Building (TB)
22:30	Hospitality Suite	Leeds Residence (LE), 1st floor

Sunday, May 21st

07:30-08:30	Breakfast (included with accommodations)	Residence Commons (CO)
08:30-10:30	Annual Meeting	Minto Centre (MC) Bell Theatre
11:00-12:00	National Council Meeting #2	Prescott (PH) Multipurpose Room
12:00-13:00	Lunch	Residence Commons (CO)
13:30-16:00	Afternoon Speakers (includes coffee break)	Azrieli Theatre (AT) Room 102
13:30	Chuck O'Dale – Welcome	

13:35	David Clark – ClearSky: A 3D Astronomical Program Demonstration	
14:15	Dr. Richard Fienberg – 2009 World Year of Astronomy	
15:00	Coffee Break	
15:15	Rolf Meier – Webcams for Planetary Imaging	
16:00	Terence Dickinson – Digital SLRs and the Democratization of Personal Astrophotography	
13:10	Group Photo (8x10 photos available at Centennial Banquet)	TBD
13:30-15:30	Tour #4 Bus Tour of City of Ottawa	Bus pick up at Leeds Residence (LE)
18:00	Centennial Banquet – Awards – Door Prizes	Residence Commons (CO) Third Floor
20:00	Dr. Douglas Welch – Coming Down from the Mountain: The Changing Nature of Professional Astronomy	
22:00	Hospitality Suite	Leeds Residence (LE) First Floor

Monday, May 22nd

07:00-08:30	Breakfast (included with accommodations)	Residence Commons (CO)
10:00-13:00	Tour #5 Guided tour of the Canadian Museum of Civilization with IMAX viewing of <i>Magnificent Desolation – Walking on the Moon</i> (includes boxed lunch)	Bus pick up at Leeds Residence (LE)

Helen Sawyer Hogg Public Lecture

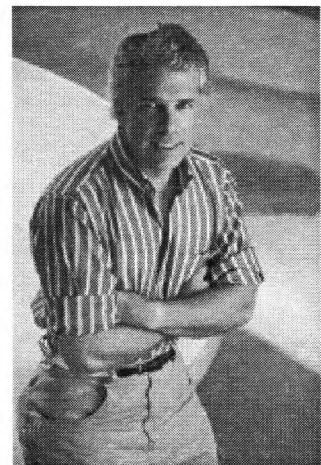
Dr. Alan Hildebrand – Hunting for Doomsday Asteroids from Earth and Space

We live in an historic time as technological advances (CCD cameras, computer hardware and software, and the internet) have enabled the discovery and *mapping* of the near-Earth small body (asteroids and comets) population. The past twenty years have seen a >30-fold increase in the number of discovered objects and the next twenty years will probably see a similar increase.

Significant advances have also been made in the imaging, compositional classification, and dynamical characterization of this population. The NEO's that are of greatest interest as threats and resource exploitation opportunities, and as exploration targets, constitute a common fraction of the NEO population. The latter two endeavors both benefit from exploring objects dynamically close to the Earth; celestial mechanics restricts the dynamically closest objects to those with orbital characteristics similar to those of Earth's orbit. Orbital mechanics also determine that the most dangerous objects, those with the highest individual impact probabilities, have Earth-like orbits.

Two Canadian projects contribute towards mapping the NEO population. The Near Earth Observation Surveillance Satellite (NEOSSat) will search for asteroids and comets in regions of sky centered on the ecliptic plane near the Sun that may not be accessed by ground-based observatories. This microsatellite will be the first space-based asset deployed to search for NEO's and is scheduled for launch in 2008. The Near Earth Space Surveillance – Terrestrial (NESS-T) project at the University of Calgary's Rothney Astrophysical Observatory uses a retrofitted Baker Nunn telescope as an asteroid search telescope. This project can search much of the sky but emphasizes coverage of the northern cap of the sky that cannot be productively searched by the more southerly-sited telescopes of other NEO survey projects. Both of these projects will remain complementary to envisage new ground-based (and highly capable) search programs such as Pan-STARRS, LSST, or DCT.

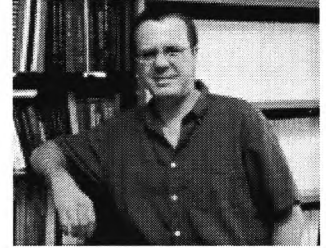
Bio: Alan R. Hildebrand is an Associate Professor in the Department of Geology and Geophysics of the University of Calgary where he holds a Canada Research Chair in Planetary Science. After graduating from the University of New Brunswick with a BSc. in Geology in 1977, he worked in the mineral exploration industry before turning to a research career. In 1992 he received a PhD. in Planetary Sciences from the University of Arizona. His research interests include the role of impacts in the history of the solar system, small bodies in the solar system (asteroids and comets), and meteoritics. He also has a strong interest in professional ethics particularly as practiced in the research community. He is a past President of the RASC Ottawa Centre. His hobbies include science fiction, English humour, hiking and scuba diving.



Centennial Banquet

Dr. Douglas Welch – Coming Down from the Mountain: The Changing Nature of Professional Astronomy

Observational astronomy has evolved dramatically in the last decade. The spectacular increase in instrumental capability and complexity (and the associated cost!) has resulted in the emergence and dominance of new modes of observing. The Gemini Observatory has been at the forefront of the effort to maximize the scientific efficiency of its large telescopes. In this talk, I will describe what has been gained and what has been lost in the process.



Bio: Douglas Welch is a Professor in the Department of Physics and Astronomy at McMaster University. His responsibilities include being the Chair of the Gemini Observatory Board of Directors and a member of the Organizing Committee of International Astronomical Union Commission 27, "Variable Stars". The Gemini telescopes are a forefront pair of 8-metre telescopes, in Chile and Hawaii, operated by an international consortium (United States, United Kingdom, Canada, Australia, Chile, Argentina, and Brazil).

The current research interests of Dr. Welch include supernovae, dark matter studies using microlensing, and variable stars. He is part of the Science Team of the "Next Generation Microlensing Survey" (a.k.a. "SuperMACHO"), which recently published the discovery of light echoes from ancient supernovae in the Large Magellanic Clouds in the journal Nature.

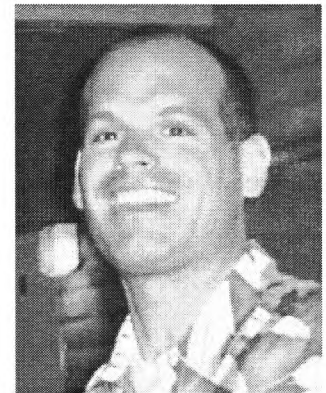
Dr. Welch first joined the Ottawa Centre of the RASC in 1972 and is also a founding member of the Hamilton Amateur Astronomers. He attended his first RASC General Assembly in Ottawa in 1973.

Discussion Forum – The Future of Advanced Amateur Astronomy in the Age of Overwhelming Professional Sky Surveys

Dr. Robert Jedicke – The Next Decade of Solar System Discovery with Pan-STARRS

The Panoramic Survey Telescope and Rapid Response System (Pan-STARRS) at the University of Hawaii's Institute for Astronomy is a funded project to repeatedly survey the entire visible sky to faint limiting magnitudes ($m_R \sim 24$). It will be composed of four 1.8m diameter telescopes each outfitted with fast readout orthogonal transfer gigapixel CCD cameras. One of the four telescopes is scheduled for first-light early in 2006 with the other telescopes becoming available a couple of years later. Roughly 30% of the surveying will be devoted to a solar system mode with a wide-open filter emphasizing the ecliptic, opposition and low solar-elongation regions.

In a single lunation Pan STARRS will detect about five times more solar system objects than the entire currently known sample. Within its first year Pan-STARRS will have detected ~20,000 Kuiper Belt Objects and by the end of its ten year operational lifetime we expect to have found 10^7 Main Belt objects and achieve ~90% observational completeness for all NEOs larger than ~300m diameter. With these data in hand Pan-STARRS will revolutionize our knowledge of the contents and dynamical structure of the solar system.



Bio: Robert Jedicke received his PhD in experimental particle physics from the University of Toronto in Toronto, Canada, for work on flavor dependence in the production of charm-strange mesons. After a brief stint in the professional Canadian Football league with the B.C. Lions, he held post-doctoral positions at Fermi National Accelerator Laboratory in Batavia, IL, and at the University of Arizona's Lunar & Planetary Laboratory where he worked on the Spacewatch Near Earth Asteroid survey.

He spent more than five years at Veeco Corporation in Tucson developing image analysis software for interferometers before accepting a faculty position at the Institute for Astronomy at the University of Hawaii in March 2003. He is currently the manager of the Pan-STARRS moving object processing system that will discover more asteroids and comets each month than have been found in the past two centuries. He has discovered two comets, and an asteroid is named after his family.

Discussion Forum

The LINEAR program has nearly shut out amateur comet and asteroid hunting. Pann-STARRS will have a greater impact on astronomy since it will image the entire visible sky from Hawaii down to 24th magnitude every four days. The Saturday morning panel discussion will center on the effects that massive digital sky surveys may have on advanced amateur astronomy.

Moderated by Peter Ceravolo.

The Panelists are:

- Dr. Robert Jedicke – Manager, Pann-STARRS Program
- Dr. Richard Fienberg – Editor-in-Chief, Sky & Telescope magazine, and Chair of the Pro-Am Committee of the American Astronomical Society
- Dr. Douglas Welch – McMaster University and Gemini Telescope Board of Directors
- David Levy, Author – popular public speaker and long-time comet hunter
- Tim Puckett – Leader of an international group of amateur supernova hunters
- Doug George – President of Diffraction Limited, manufacturer of MaxIm DL and MaxDSLR imaging software

Astronomy Tools Workshop and Paper Session Abstracts

Randy Attwood – The History of Canada in Space

Canada has been active in space flight since the beginning. We were the third country to have a satellite launched into Earth orbit. Many Canadians participated directly in the Apollo program. Our robotics technology on the Space Shuttle and International Space Station has paved the way for our astronauts' flights. Now we are building and flying smaller scientific payloads that are returning exciting results.

But what next? The shuttle program is winding up and the Moon and Mars beckons. Can good old Canadian know-how continue to secure our tickets into space? How we got here and where we are going will be the focus of this presentation.

Bio: J. Randy Attwood became interested in space exploration and astronomy around the same time – the summer of 1969. He has closely followed the manned and unmanned space programs and has witnessed 11 space shuttle launches and one landing. He is a Past President of the RASC and of the Toronto Centre. In 2003 he formed the Mississauga Space Society of which he is President. He is also President of the Earthshine Astronomy and Space Science Foundation – a not for profit organization which promotes astronomy and space science education in Southern Ontario. Randy works as an Information Systems Manager at CIBC.

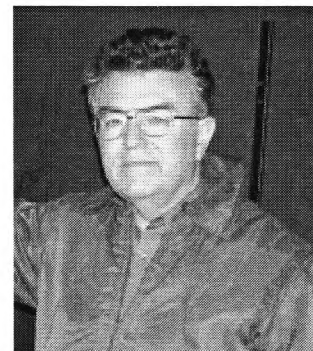


Paul Boltwood – Developing a Highly Refined Observatory for Working with the Pros

Thanks to CCD cameras, it is possible for some amateurs to do publishable astronomy in non-amateur fields. In many cases the amateur will team up with a professional astronomer, and this relationship will be discussed. Equipment needs to be selected and adapted with science in mind. This will be followed by some pictures of my observatory, a discussion of the philosophy behind it, some scientific results, and a bit of the future.

Bio: Paul Boltwood has been an amateur astronomer for 45 years. When young he made the optics for, constructed and used several telescopes. Two broken mirrors and too much portable observing hassle made him into an armchair astronomer until 1988. He then built an observatory equipped with an Astrophysics 7" Starfire refractor. The telescope was intended to be used for visual observing of objects at high magnification such as planets and globular clusters.

While waiting 18 months for the telescope to arrive, he discovered CCD cameras. He then spent years designing and building a homemade CCD camera plus much software. The observatory was then used for astrophotography, and for photometry of blazars. For the photometry work he won the RASC Chant medal and the ASP Amateur Achievement Award. Asteroid 8785 is named Boltwood. Recently he has designed and manufactured cloud sensors for astronomers.



Paul Campbell – Solar Radio Astronomy and a Magnetar Observation

Paul will be talking about his involvement with A.A.V.S.O. and their Sudden Ionospheric Disturbance program. Using easy-to-build equipment to listen to submarine transmissions, it is possible to detect rapid changes in the ionosphere (Sudden Ionospheric Disturbances). Most of the time the ionosphere is disturbed by solar flares so the Sudden Ionospheric Disturbance program is really a solar flare observing program. Every once in a while, and this is very rare, an event happens that can affect Earth's ionosphere from Deep Space. On December 27, 2004 at 21:30 UT such an event occurred. This involved a magnetar known as SGR 1806-20. This was one of the brightest blasts in recorded history. Paul will be discussing the observations made by Canadian A.A.V.S.O. observers as well as others.



Bio: Paul is the owner and operator of a Fire Alarm company operating in Edmonton, Alberta. Oddly enough, and because of the demands on his time, he is now doing solar observing and submitting data to A.A.V.S.O. for solar work including sunspot counts and solar radio astronomy. Paul Campbell first became an amateur astronomer when he met Peter Ceravolo at the first Alberta Star party in Chain Lakes, Alberta. Despite a torrential hailstorm, Peter managed to talk Paul into becoming a member of the Edmonton Chapter of the R.A.S.C. Since then he's had an interest in deep sky observing.

David Clark – ClearSky, a 3D Astronomical Program Demonstration

Dave Clark has worked on hobby-ware planetarium programs since 1992. In 1996 the 3D astronomical demonstration program ClearSky began to take shape. ClearSky allows the user to freely navigate through a simulated solar system of planets, natural satellites, asteroids, comets, spacecraft, and externally generated orbital data collections.

The user can travel on or target any represented object, and can view the surrounding scene with respect to a variety of fixed and moving reference frames. ClearSky demonstrates many principles of solar system dynamics such as orbital motion, orbital precession, horseshoe orbits, pseudo-satellites, eclipses, and motion against the celestial sphere. ClearSky supports both on-demand and regularly scheduled downloads of data from the Minor Planet Centre's orbital database, Harvard-Smithsonian Centre for Astrophysics Observable Comet Database, JPL's Horizons ephemeris generator, and JPL's space calendar. It also is easily adapted to offer 3D visualizations of both real and simulated object and particle data such as meteor stream densities, extrapolated meteor orbits, and near-earth objects.



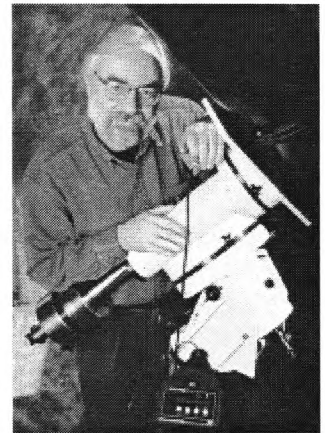
Bio: Dave is employed as a software development manager at Research In Motion in Waterloo Ontario, and currently serves as the RASC's national treasurer. He has been a member of the London Centre since 1990. ClearSky can be downloaded at no charge from Dave's web site at <http://www.davidclark.com/clearsky>.

Terence Dickinson – Digital SLRs and the Democratization of Personal Astrophotography

The astonishingly rapid evolution of digital cameras since their introduction in the late 1990s has quickly led to the development of the digital single-lens-reflex camera, or DSLR.

These cameras have opened deep-sky astrophotography to a much broader population of astronomy fans than ever before by offering a straightforward, powerful way for an amateur astronomer to gather celestial images that were previously impossible to obtain with film emulsion. The talk will focus on "how-to" techniques, equipment recommendations – including modified red-sensitive DSLRs – and will include a wide range of examples.

Bio: Terence Dickinson became a member of the RASC in 1958 and has been involved in astronomy full time since 1966 when he joined the staff of the McLaughlin Planetarium in Toronto. He is the author of 15 astronomy books and is currently editor of the Canadian magazine SkyNews. Among his numerous awards are: the Order of Canada, an honorary doctorate degree from Trent University, Peterborough, Ontario, and the Astronomical Society of the Pacific's Klumpke-Roberts award for outstanding contributions to public understanding of astronomy.



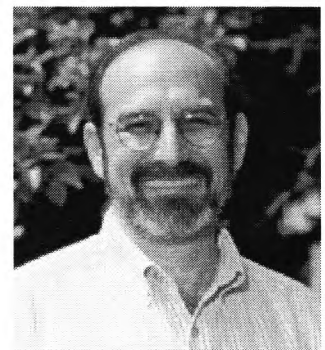
Dr. Richard Fienberg –2009 World Year of Astronomy

The year 2009 marks the 400th anniversary of Galileo's first use of a telescope to observe the heavens. With his discovery that the Earth is not alone in the cosmos but is surrounded by other worlds, Galileo opened the way to a new conception of the universe, one with profound scientific, philosophical, and religious implications.

Under the auspices of the International Astronomical Union, which promotes and coordinates worldwide cooperation in our field, astronomers and science educators from around the globe petitioned the United Nations Educational, Scientific and Cultural Organization to declare 2009 the International Year of Astronomy (IYA). In October 2005 UNESCO passed a resolution to that effect and forwarded it to the UN General Assembly for consideration during its 2006 session.

The goal of the IYA is not just to celebrate this important anniversary among both professional and amateur astronomers, but also to spread awareness of astronomy's role in enriching our culture, nourishing a scientific outlook in society, and attracting young people to careers in science and technology.

Bio: Rick Fienberg is Editor in Chief of Sky & Telescope magazine and serves as editorial director of Sky Publishing. He joined Sky & Telescope's editorial staff in 1986.



He has an astronomer's "three-degree background," having earned his B.A. in physics from Rice University in 1978 and his M.A. and Ph.D. in astronomy from Harvard in 1980 and 1985, respectively. His thesis research took him to Arizona and Hawaii to capture infrared images of planetary nebulae, active galaxies, and the center of the Milky Way.

Rick is a member of the American Astronomical Society and the International Astronomical Union (IAU), and in 2002 he was elected a Fellow of the American Association for the Advancement of Science. In 2003 the IAU named asteroid 9983 Rickfienberg in his honor.

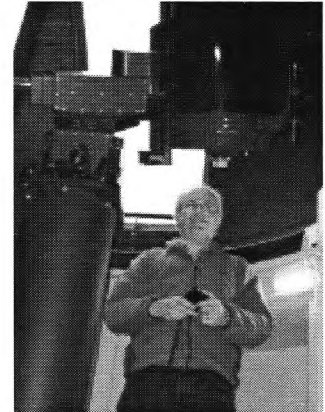
Although trained as a professional astronomer, Rick remains an amateur at heart. From his home just outside Boston he uses a Tele Vue-85 refractor to observe the Sun, Moon, planets, and star clusters. On weekends he drives 100 miles north to the dark skies of southern New Hampshire, where he observes galaxies and nebulae using a Meade 12-inch LX200 Schmidt-Cassegrain telescope mounted permanently in a roll-off-roof observatory that he built himself

Douglas George – Building an Automated Observatory with Off-The-Shelf Components

Automated observatories can execute observing programs completely unattended, allow students to make observations at a remote dark-sky observatory in real time, and even provide public access over the internet. Automation is no longer the domain of the large, professional observatory. With the growing availability of off-the-shelf and relatively inexpensive hardware and software, a boom is underway in mid-sized automated observatories for both amateur astronomers and educational institutions.

Doug will discuss the main components required for an automated observatory, and discuss some of the tradeoffs involved. He will present some examples of automated observatories, including the Ottawa Centre's SMARTScope.

Bio: Doug George is a Professional Engineer and President of Diffraction Limited, an Ottawa-based company that produces astronomical imaging products including MaxIm DL. He is a past President of the RASC and of the Ottawa Centre, and is currently Chairman of the Ottawa Center SMARTScope project. He also teaches a continuing education astronomy course for the local school board. In addition to enjoying astrophotography and observing occultations, Doug enjoys participating in patrol programs. He has co-discovered one comet visually, and co-discovered 12 supernovae as a member of the Puckett Observatory Supernova Search team.

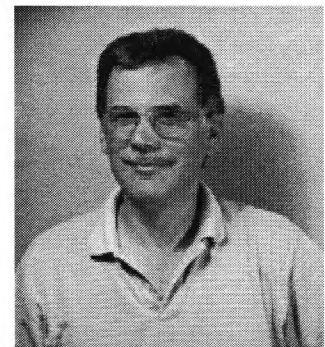


Tom Kaye – Radial Velocity Detection of Extra Solar Planets by Non-Professionals: The Spectrashift Project

Spectroscopy has long been the ignored corner of amateur astronomy and was generally regarded as difficult to impossible with small telescopes. With the advent of robotic scopes and high efficiency CCDs, this aspect of astronomy is now open for exploration. The Spectrashift.com project is an international team of amateurs who have constructed and implemented a spectrograph/telescope system capable of precise radial velocity measurements.

This was the first non-professional spectrograph to detect an extrasolar planet using star wobble. The team is led by Tom Kaye, who will outline the history and progress of the project covering the instruments, software and data collection. The detection of the planet around Tau Boo will also be presented, along with future plans and progress on a 1.1 meter telescope for discovery of extrasolar planets.

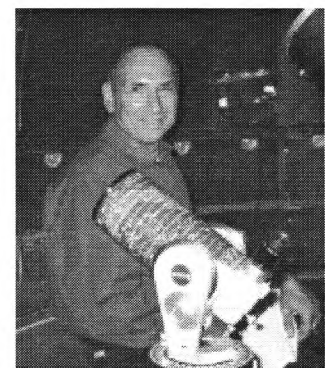
Bio: Tom Kaye lives in Chicago where the conditions don't allow for much in the way of astronomy. This led him to get involved in spectroscopy and specifically radial velocity measurements in the late 90's. By 2000 he had assembled a team of high level amateurs dedicated to pursuing extrasolar planets and built a system capable of measuring the velocity fluctuations of the exoplanet around Tau Boo. His other interests include spectroscopy of fossils and the connection between gamma ray bursts and mass extinctions. Formerly involved in the paintball industry, Tom is now retired and pursues astronomy and paleontology full time.



David Levy – Comet Hunting Then and Now: A Personal Retrospective of the Changing Methods and Experiences in Comet Hunting

This presentation is a discussion of how comet hunting has changed since I first began searching the sky for comets 40 years ago, on December 17, 1965. On a typical night then I would be out with either an 8" f/7 reflector or a 6" f/4 reflector, searching visually from field to field. The 8-inch later found one comet. In 1982 I added a 16-inch f/5 to my family of telescopes, and with it added 7 comets. Between 1989 and 2003 I searched photographically, both with Gene and Carolyn Shoemaker and later with Carolyn and my wife Wendee. On a typical night now, however, I search visually with one telescope while other telescopes, equipped with CCD cameras, photograph selected areas of sky in an automated portion of the search.

Does the amateur have a future in comet hunting? From this personal experience, I will evaluate the chances that amateurs have to stay in the game, and succeed in it.



Bio: David H. Levy is one of the most successful comet discoverers in history. He has discovered 21 comets, eight of them using his own backyard telescopes. With Eugene and Carolyn Shoemaker at the Palomar Observatory in California he discovered Shoemaker-Levy 9, the comet that collided with Jupiter in 1994. Levy is currently involved with the Jarnac Comet Survey, which is based at the Jarnac Observatory in Vail, Arizona but which has telescopes planned for locations around the world. Levy is the author or editor of 31 books and other products. He won an Emmy in 1998 as part of the writing team for the Discovery Channel documentary, *Three Minutes to Impact*. As the Science Editor for Parade Magazine, he is able to reach more than 78 million readers, almost a quarter of the population of the United States. A contributing editor for Sky and Telescope Magazine, he writes its monthly *Star Trails* column, and his *Nightfall* feature appears in each issue of the Canadian Magazine SkyNews. David and his wife Wendee host a weekly radio show available worldwide at www.letstalkstars.com.

Dr. Jaymie Matthews – The Search for Terra Nova: Canada's Space Telescope Starts the Hunt for Other Earths

The Canadian Space Agency's MOST space telescope has made the first survey for Earth-sized planets around another Sun-like star. And new results about an exoplanetary system have been unearthed. Or perhaps that should be "un-Earthed".

We have reached a new stage in astronomers' ability to search for planets like Earth outside the Solar System. Unique measurements of the star HD 209458a by MOST have been able to eliminate the presence of Earth-sized planets in several of the orbits most expected by theorists. And in the process, these measurements eliminate certain theories to explain the exotic nature of the giant planet already known to orbit that star.

The MOST (Microvariability & Oscillations of STars) satellite is about the size and mass of a suitcase, but it is capable of measuring tiny changes in the brightness of a star as small as 1/10,000th of a percent, and it can put that star under an astronomical "stakeout", monitoring it 24 hours a day for weeks at a time. No other observatory – on Earth or in space – can duplicate this astronomical one-two punch.

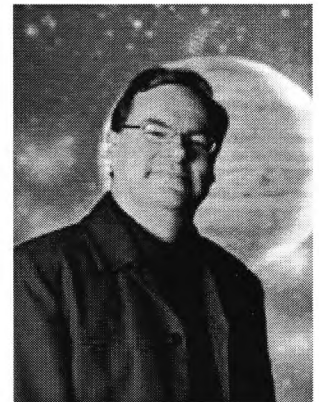
As an added bonus, MOST is giving astronomers insights into the atmospheric properties and weather on HD 209458b – a planet we can't even see around a star 160 light years away!

MOST is expected to operate for at least several more years, and it will return its gaze to HD 209458 on a regular basis. As the data accumulate, their sensitivity to Earth-like planets in larger orbits will improve. And in the coming years, it will be joined in space by other planet hunters: the French COROT mission, due for launch in October 2006, and NASA's Kepler satellite, which should start the first concerted search for truly Earth-like worlds in 2008.

For the moment, though, MOST is the only game in town. And it's a game we can't lose. If we find an Earth-sized planet, that's the jackpot. But if we rule out Earths in certain places in the Galaxy, we learn more about the rules of how planets form and evolve around other stars, so astronomers can play the planet-hunting game even better in the coming years.

MOST (Microvariability & Oscillations of STars) is a Canadian Space Agency mission. Dynacon Inc. of Mississauga, Ontario, is the prime contractor for the satellite and its operation, with the University of Toronto Institute for Aerospace Studies (UTIAS) as a major subcontractor. The University of British Columbia (UBC) is the main contractor for the instrument and scientific operations of the MOST mission. MOST is tracked and operated through a global network of ground stations located at UTIAS, UBC and the University of Vienna.

Bio: Dr. Jaymie M. Matthews is Mission Scientist for the MOST Space Telescope and Associate Professor Dept. of Physics & Astronomy at the University of British Columbia.

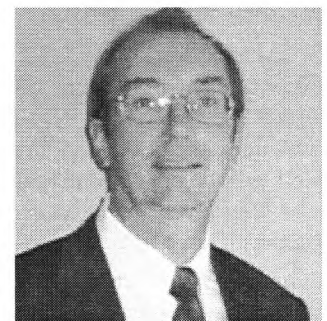


Rolf Meier – Webcams for Planetary Imaging

A few years ago, amateurs began to use inexpensive webcams for lunar and planetary imaging. Amazing images have been obtained using these simple, lightweight cameras. This has become possible through the work of some dedicated amateurs who developed sophisticated software to deal with the massive output files, and they have made this software freely available to the amateur astronomy community worldwide. Thus, a new type of imaging was created, and it continues to evolve.

This talk will describe the typical hardware and software in use today and how amateurs have collaborated through the Internet to share techniques. The technical limitations of full colour CCD chips will be dealt with, and how some tricks and modifications have overcome them. Finally, a new breed of webcams will be described, which promises to provide the next level of planetary image quality and detail, although at somewhat higher cost.

Bio: Rolf Meier works at Nortel as a systems designer currently specializing in video. He has been a keen amateur astronomer since he was a child. He is a graduate of Carleton University (B Eng, 1977). Rolf started building his own telescopes in the late



1960s and joined the RASC in 1970. In 1974 he commenced a systematic search for new comets, using the 400 mm telescope of the Ottawa Centre, and subsequently discovered four comets, all named after him.

He was awarded the Chant Medal of the RASC in 1979. He has served on the Council of the Ottawa Centre in a number of roles including President. Another of Rolf's astronomy interests is the observing of planets, particularly Mars. Rolf presently resides in rural Ottawa where he has a variety of telescopes such as a 6-inch refractor, C-14 SCT, and 17.5-inch Dobsonian. His wife Linda is also an avid amateur astronomer and his son Matthew is currently studying biology at Carleton University.

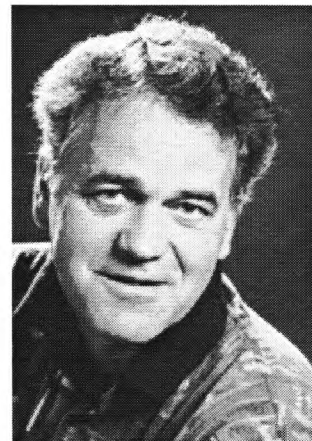
Dr. Anthony Moffat – Nano-satellites for Astronomy – The Canadian BRITE Nanosat Mission

Canada has already established itself at the world forefront in astronomical microsatellites with the highly successful MOST mission. Now UTIAS/SFL (University of Toronto Institute for Aerospace Studies/Space Flight Laboratory) is poised to go a step further, thanks to Dynacon Inc.'s development of unique, miniaturized reaction wheels and star-tracking system. These can be packed into a shoe-box size satellite along with a small (30 mm) telescope and (CMOS) detector.

BRITE, the BRiGht Target Explorer, is being proposed as a nanosatellite to photometrically measure low-level oscillations in the sky's 286 stars brighter than visual magnitude 3.5, with unprecedented precision and time sampling. Also, BRITE's three-axis pointing performance (1 arcminute rms stability) is a significant advancement over anything that has ever flown before on a nanosat. These stars turn out for the most part to be among the most luminous, hence massive stars.

Such stars dominate the ecology of the Universe and represent the first stars ever formed (although long gone from the local Universe). Astronomers are eager to measure the variable behaviour of massive stars in order to explore their inner workings in a unique way.

Bio: Tony Moffat is a professor of astronomy at Department de Physique, Université de Montréal. His main scientific interests are massive stars, stellar winds, structure and dynamics of the Galaxy and star clusters.

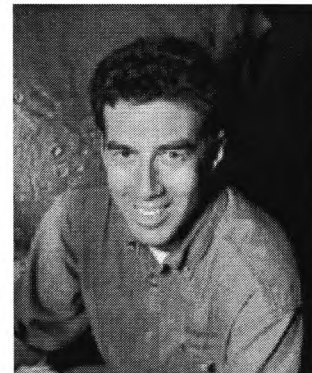


Paul Mortfield – Automating Remote Imaging and Photometry

It used to be that imagers would sit by their telescope, move it from target to target and stay up all night adjusting parameters and essentially hand holding the fine details of the image gathering process. With today's off-the-shelf solutions, we can automate all the image acquisition procedures and most importantly control the telescope remotely – whether it is located in our backyard or on a different continent – all from the comfort of home.

To reduce all this gathered data, a few simple mouse clicks is all that's needed to produce photometric and astrometric results. Paul will discuss the various tools on the market and show the integration of these components into a working system that allow today's amateurs to make more efficient use of those rare clear nights and the excitement of contributing useful science.

Bio: Paul Mortfield is an astronomer and educator with Industrial Stars, and recently returned to Canada after nearly 20 years in California. He has created innovative astronomy educational products for NASA's Sun-Earth Connection, and for Stanford University's SOLAR Center, part of the SOHO solar spacecraft mission. He was a regular television commentator on astronomy for CBS-5 in San Francisco, the Discovery Channel, and is host for a variety of educational broadcasts on NASA-TV. In his free time, Paul uses his backyard observatory for research projects and astrophotography.



Dr. Neil Rowlands – Canada's Contribution to the James Webb Space Telescope

Canada has been a participant in the James Webb Space Telescope since the project inception in 1996. NASA, ESA and the CSA are developing the JWST Observatory as the successor to the Hubble Space Telescope. Unlike Hubble, JWST will be placed 1.5 million km from Earth, where it will be passively cooled. With a 6.6 m primary mirror and an operating temperature near -233C, JWST will be orders of magnitude more sensitive in the infrared than even the largest ground-based telescopes. With this sensitivity JWST will reveal how the first stars and galaxies came together to form the universe we see today.

As the JWST project has matured, so too has the Canadian contribution, the major component of which is now the Fine Guidance Sensor, which includes a science imaging camera. A historical perspective on the evolution of the Canadian role on JWST will be given, followed by a description of the current design and its operational and scientific capabilities.

Bio: Although born in England, Neil grew up in Edmonton, Alberta. After picking up a book on astronomy in grade six he was hooked, joining the RASC Edmonton Centre that year. He obtained a B.Sc. in Engineering Physics at the University of Alberta



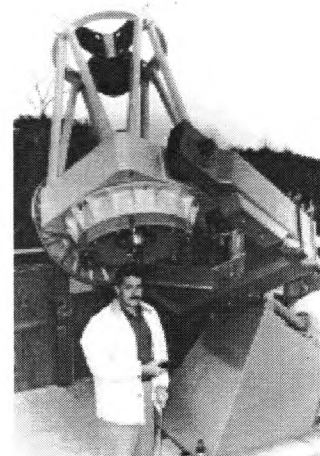
in 1985, and his graduate studies were in astronomy at Cornell University. Neil currently works at COM DEV developing spaceborne instrumentation for atmospheric research, earth observation and astronomy. He has been involved in several projects that have flown in space, including a number of CALTRAC star trackers, the Wideband Imaging Camera for the IMAGE mission, and the MAESTRO instrument launched in 2003 on Canada's SciSat-1. Neil has been involved with the Canadian contribution to JWST since 1998.

Tim Puckett – Running an Amateur International Automated Supernova Search Program

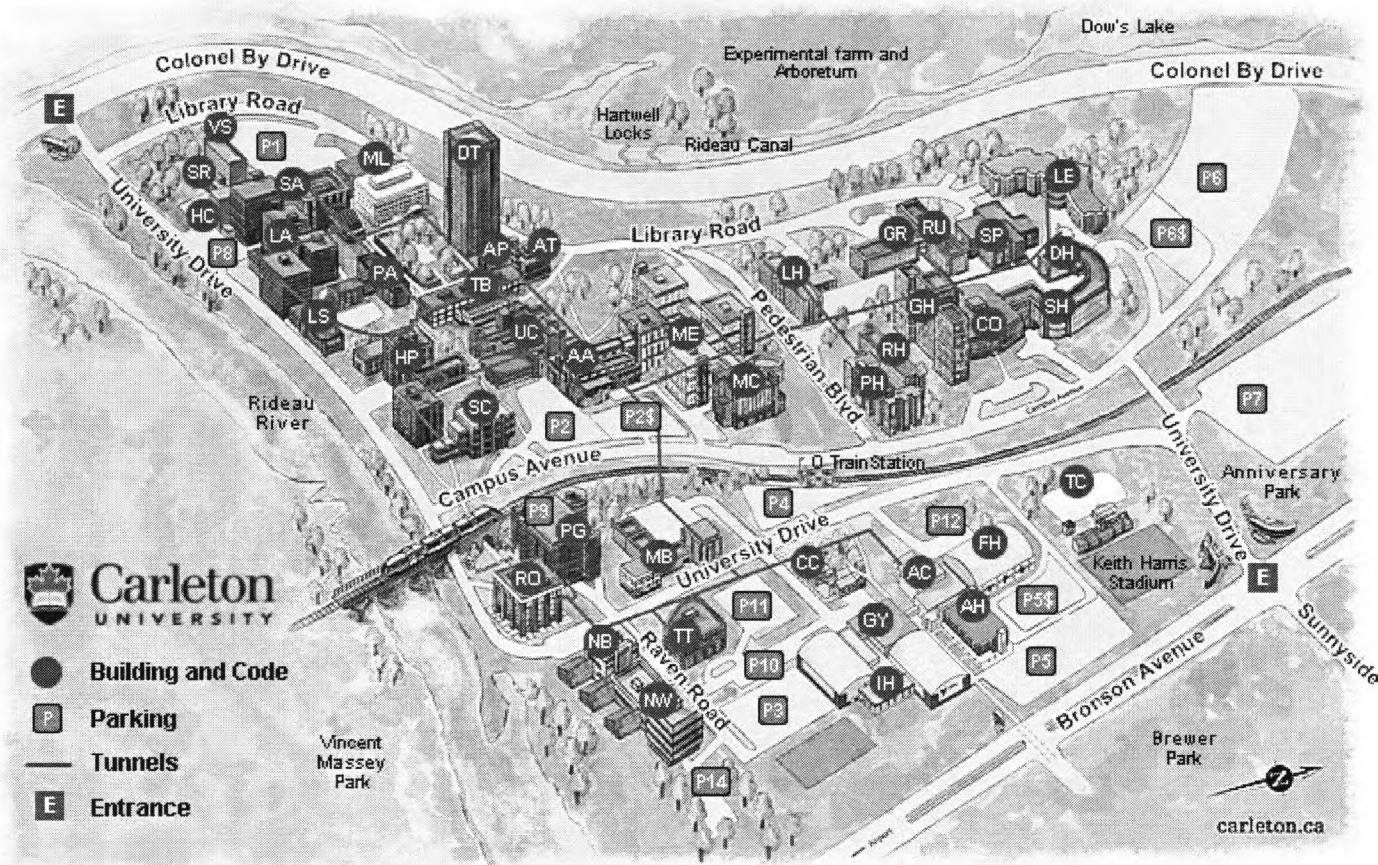
A pioneer in the field of amateur CCD astro-imaging, Tim Puckett has been using CCD cameras since 1988. He has built many robotic telescopes and is the co-discoverer of 111 supernovae to date. His spectacular comet photos have graced the pages of many magazines world wide.

Bio: Tim is a 26-year veteran amateur astronomer, 20 years of which he has been an avid astrophotographer. He has been featured on ABC, NBC, CBS, FOX, CNN, BBC, Good Morning America, Discovery, and The Learning Channel. He has been published in 17 countries, and is a coauthor of *The Art & Science of CCD Astronomy*.

Currently Tim is operating an automated supernova patrol program. He is a small business owner in Atlanta, GA., and operates the Puckett Observatory in the Appalachian Mountains. Tim is also currently working as a robotic telescope consultant to many professional institutions.



Campus Map

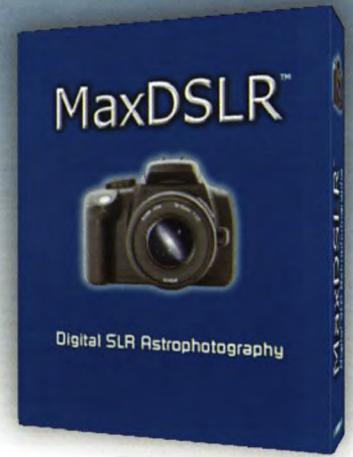
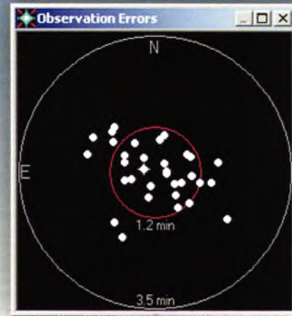


Abbreviated Building List:

- | | |
|------------------------|------------------------|
| (AT) Azrieli Theatre | (PH) Prescott House |
| (CO) Residence Commons | (TB) Tory Building |
| (LE) Leeds House | (UC) University Centre |
| (MC) Minto Centre | |

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MaxDSLRL can also be upgraded to MaxIm DL for cooled CCD camera support and additional features.

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Important changes in the General Assembly

Change in speaker schedule

- Paul Mortfield, Automating Remote Imaging and Photometry
Friday, May 20th – **11:00**
- Douglas George, Building an Automated Observatory With-Off-The-Shelf Components
Friday, May 20th – **14:00**

Change in Venue

- Annual Meeting, Sunday, May 21st, 8:00-10:00 am
Azrieli Theatre 102
- Council Meeting #2, Sunday, May, 21st, 10:00-12:00
Azrieli Theatre 102

Time Change

- Pick up for Tour #5, Monday, May 22nd to Museum of Civilization/Imax movie
9:00 am at Leeds Residence

Tour cancellation

- Museum of Science and Technology-Friday, May 19th
Cancelled