



## To boldly go...as Canadians always do

In 1984, some twenty-five years ago, a young Canadian astronaut named Capt. Marc Garneau took the ride of his life. It was a trip into low earth orbit aboard the Shuttle Challenger. Dr. Garneau was the first Canadian astronaut into space and his adventure represented one of the most unique moments in Canada's ongoing participation in both the US space program, and later international space consortia such as the ISS.

This edition of the CUPJ features an interview of Dr. Garneau as he begins a new career – his fourth in as many decades. Dr. Garneau was recently elected to the House of Commons. We wish him well in his continuing service to Canada.

Our nation has over the past fifty years developed a uniquely Canadian blend of space and aerospace assets. One of the most unique is the Radarsat Synthetic Aperture Radar (SAR) satellite system. In November 2008 the Government of Canada announced \$ 40 million of funding for the design of the next generation of Radarsat satellites, the Radarsat Constellation Mission, a proposal first presented to Parliament by Dr. Garneau while he was President of the Canadian Space Agency, and resurrected by him last spring amidst a healthy debate about the Radarsat issue in the House of Commons.

On behalf of the people of Canada I would like to thank Minister Jim Prentice and Dr. Marc Garneau for playing such an important and constructive role in the Radarsat debate. While the two gentlemen may now sit opposite each other in the House of Commons, I know them to be fine Parliamentarians in the true Canadian sense. Building consensus is the Canadian approach. I know there is no human problem here in Canada or abroad that cannot be made better by a good debate in our House of Commons. In a country so blessed as ours ... where much has been given, much is expected in return. The people of Canada must continue to help the world to solve their human problems.

Canada has been part of the exploration of space from the very beginning. We have earned a very special place amongst the community of nations. Canada was the third nation to orbit a satellite, Alouette, a test bed for satellite transceivers.

Even before Alouette went into orbit Canadians helped build the precise transceiver that made the US Navy Transit satellite a success and ushered into existence space based global positioning. In

1957, while Sputnik flew overhead, it seems that some bright physicist at the Naval Research Lab outside of Washington noticed that the Doppler shift of a precise and stable radio signal, and an accurate knowledge of a satellite's orbital dynamics, allowed you to use such a satellite as a very precise navigational beacon. Submarines that bring stability to nuclear deterrence are possible because of global positioning systems. GPS is now one of the most widely used space-based asset.

We were one of the first nations to see our astronauts into space and to see them walk in space, many years before nations like the People's Republic of China. However, in true Canadian fashion, we do not over play or over state our place amongst nations. We are a nation respected by all, yet feared by none. As a young country and open society we have earned our rightful place amongst the community of nations. Perhaps in the not so distant future a Canadian will walk on the Moon or even on Mars.

Along with being active in space, Canada also plays a crucial role in aerospace matters with groups like the UN's International Civil Aviation Organization (ICAO), located in Montreal. ICAO is one of Canada's ongoing and most important contributions to the United Nations and to international law. There is an opportunity for a greater Canadian role in space and aerospace matters.

Satellites are perfect platforms for specialized earth observation that can help the United Nations, its Security Council and organizations like the WHO and WFO, to assess the severity of natural disasters and the best manner in which to provide relief. Satellites are also perfect platforms to monitor conflict and war.

I would like to offer a challenge to the new American President, to the Prime Minister of Canada and to the UN Secretary General to establish here in Canada, perhaps even here in Vancouver, a new UN organization, the International Civil Earth Observation Organization (ICEOO) with the mandate to use existing and future earth observation satellites to monitor human activity in support of international law and humanitarian efforts. Canada's expanding fleet of Radarsat satellites could form a core of such assets. In this edition of the CUPJ there is an article titled "The U-2 and the AVRO Arrow" that reminds us how good information helps national leaders make wise decisions.

This edition of the CUPJ has the theme the UN sponsored 2009 International Year of Astronomy.

There are articles about the IYA by Dr. Jim Hesser, the Chair of the Canadian IYA committee, and by a number of astronomy undergraduates. Special mention should be made of Dr. Jim Hesser, Chair of the Canadian IYA committee, Dr. Paul Hickson of CASCA, Dr. Donald Lane of RASC as well as representatives from FAAQ and two CASCA's Students, Annemarie Pickersgill (University of Western Ontario) and Deanna Pineau (University of Victoria), who attended the official launching of the 2009 International Year of Astronomy at UNESCO headquarters in Paris on 15-16 January on behalf of astronomers and astrophysicists in Canada.

Annemarie Pickersgill, an undergraduate student specializing in Planetary Science at the University of Western Ontario, and Deanna Pineau, an undergraduate student in Physics and Astronomy at the University of Victoria, were selected by CASCA and the Association of Canadian Universities for Research in Astronomy (ACURA) in a national essay competition.

During 2009 the CUPJ will run other astronomy articles. The April edition of the CUPJ will feature Women in Physics.

Please continue to submit your articles to the CUPJ. We would like to thank Ricky Chu for his work in 2007-2008. Those of you who have the time and the inclination to try your hand at technical publication, the Canadian Undergraduate Physics Journal invites you to volunteer for our journal.

An errata can be found in the article titled 'George Michael Volkoff, the University of British Columbia and the TRIUMF project' in the Sept. 2008 edition of the CUPJ. The name Dr. George Pritchard on page 24 of this article should read Dr. George Pickard. We would like to thank Dr. Erich Vogt for pointing this typographical error out to the author.

In 2009, amidst all the uncertainty and turmoil in the world, let us find the time to turn our eyes upwards and enjoy what the heavens have to offer us.

**PATRICK BRUSKIEWICZ**  
EDITOR-IN-CHIEF

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