Canadian Alumni
of the International Space University

Association des anciens étudiants canadiens
de l'Université internationale de l'espace

Bulletin – Newsletter

Cosmonotes

December – décembre 2003

Cosmonotes

Cosmonotes is the official newsletter of the Canadian Alumni of the International Space University Association (CAISU).

CAISU

The purposes of CAISU are:

To provide for the promotional and preservation of contacts between all Canadian alumni of the International Space University;

To inform any interested party in Canada about the affairs of the International Space University;

To co-operate with other interested organizations in Canada in promoting the cause of peaceful space activities;

To represent the members when dealing with various institutions of the International Space University and its representatives;

To organize various activities and act in such a way as to fulfill the above objectives;

To advance and promote space education and space research in Canada.

Cosmonotes Editor:

Eric Choi, SSP'99 & '03

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President's Message

By Larry Reeves (MSS'97)

Standard disclaimer: The following are my own opinions, and should not necessarily be considered to be legally binding or morally exemplary.

Welcome Recent MSS and SSP Grads!

On behalf of CAISU, it's my pleasure to welcome our newest members to the fold, those who have recently completed the MSS and SSP. With approximately 230 alumni members in Canada and around the world, CAISU is one of the largest (if not *the* largest) alumni organizations in the world. Plus, there are many more staff and faculty members who keep in touch with us and get involved in our activities.

It's Roadshow Season!

The diminishing hours of daylight and the emergence of snow spreading across the landscape signal the approach of…*Roadshow season*! For the uninitiated, the Roadshow is an annual campaign that CAISU prepares to promote ISU and the CFISU scholarships to potential attendees to next year's SSP. This is quite likely the way that most SSP attendees first heard about ISU and the full scholarships that are offered. For those received a scholarship to attend SSP 03 in Strasbourg, presenting a Roadshow at their university or company was as close to mandatory as you can get without signing a contract. The Roadshows began in October, and since I decided to get married around that time, I want to thank Eric Choi (SSP'99 & '03) for taking the responsibility of coordinating presentations. So far, the following Roadshows have taken place:

- École Polytechnique – Arthur Prévot (SSP'03) and Bruno Sylvestre (SSP'02/MSS'03)
- University of Alberta – Tim Poon (SSP'03), at the Engineering Open House
- University of Toronto – Dawn Lim (SSP'03) and Caroline Nowlan (SSP'03)
- University of Victoria – Larry Reeves (MSS'97)
- University of British Columbia – Larry Reeves (MSS'97)

Space Boutique Closure

A few years ago, the CAISU Executive of the day came up with the idea of creating a business to raise money for ISU scholarships, primarily for the MSS program for which CFISU currently does not offer any financial assistance. This idea led to the creation of the Space Boutique, a small business that sold merchandise promoting the Canadian Space Agency (CSA) and various Canadian space missions, especially Shuttle missions with Canadian astronauts. In addition to having a small booth set up every week at the CSA Headquarters, the Space Boutique also had a web site to sell its wares online.

Although a noble cause, business has not been sufficient to generate any scholarship money, which became obvious to the Executive at the beginning of the year. Business at the Space Boutique has not been enough to cover expenses. To put it bluntly, it was losing money and was eating into the annual CAISU budget from the CFISU. The amount lost was approximately $2,500 each year.

While obviously not an easy or fun decision, the closure of the Space Boutique was sadly necessary. The effort that was required on a regular basis (and likely that which would be required if the Boutique were to generate an amount of profit which would meet its scholarship goal) in order to properly manage the Boutique exceeds that which the Executive, as volunteers outside of our regular jobs, can give for the returns that it generates.

Although there were some periods of good sales – most notably for Canadian astronaut missions – the majority of the business came through the weekly kiosk that was set up at CSA, which served a limited number of potential customers. Efforts by the Executive to increase the exposure were not successful, and so faced with the prospect of not being able to fulfill its *raison d'être*, the Executive has regretfully decided to end the operations of the Boutique. The final day of operations at CSA was on September 25, and the website has also been shut down.

Vancouver SSP Update

Hopefully by now you all know that Vancouver was selected to host the 2005 Summer Session Program. I'm really looking forward to that summer. Fasten your seatbelts and pump a little air into your anti-g suit folks – this is going to be one heck of a ride!

Quite amazingly, following the euphoria of being awarded SSP 2005, it has been quite quiet. In recent months, though, preparations have been started. The first step is prepare a rough budget, and to start selecting people to be on the Steering and Planning committees. The former will be composed of senior representatives from the University of British Columbia (UBC), industry, and the community. This committee would have the responsibility of reviewing all high-level issues, such as logistics and fundraising. For the Planning committee, I've started soliciting volunteers from the local ISU alumni – anyone who knows Vancouver well and can organize or fundraise for specific events (ie. we are planning a salmon barbecue at the Pacific Space Centre during the summer fireworks festival) is encouraged to contact me at lreeves@mda.ca. We also had several meetings with the UBC Housing office, and they are excellent professionals.

Rest assured that we are committed to having the best SSP that ISU will ever see! We will also definitely be seeking help and support from the entire CAISU community. I hope that many of you will get to meet and

thank Dr. Doug Romilly at UBC, who has been our champion there to get us as far as we have come.

ISU Accreditation

ISU Headquarters continues along the process to gain accreditation, which would pave the way for ISU being recognized by the Canada Customs and Revenue Agency (CCRA) and irrefutably allowing students (mainly those of the MSS) to claim their tuition on their income tax. Like any space project, this one has seen its fair share of delays. However, ISU continues to pursuing it, and I will keep pestering them for updates. Although no projected date has been given, Francois Becker told me that it is "now in its final phase and is being handled directly by the Direction of Higher Education at the French Ministry of Education". As soon as accreditation is received, I will assist their application to CCRA in any way I can.

Election of New CAISU Executive

The elections for the CAISU Executive took place at the Annual General Meeting that was held at the Canadian Space Agency on November 29. Your new CAISU Board of Directors for 2004 is:

- President – Larry Reeves (MSS'97)
- Vice-President – Noemi Nagy (SSP'93/'95/'00)
- CFISU Liaison – David Phillips (MSS'01)
- Secretary – Jasmin Letendre (SSP'02)
- Treasurer – Daniel Schulten (SSP'98)
- Membership Director – Valery Tessier-Leon (MSS'00)
- Webmaster – Simon Kruijen (MSS'00)
- Regional Directors – Talmon Feuerstein (SSP'02 & MSS'03), Johanne Heald (SSP'96 & '98), Joan Saary (SSP'01)

In addition, Shannon Ross Kaya (SSP'00) was elected the new CFISU committee representative. The CAISU Executive wishes to thank Gary Crocker (SSP'90) who had served on the committee with distinction for the past two years.

The New Year

Next year will be an interesting prelude to the Vancouver SSP. Doug Romilly and I will plan on spending a week in Adelaide to learn all we can about preparing for and hosting the SSP. Also, CFISU has indicated that it would like to hold the pre-SSP Send-Off in Vancouver, and my company MacDonald Dettwiler and Associates (MDA) would be the obvious location for it.

More significantly, Vancouver will host the International Astronautical Congress (IAC) in October. MDA is very involved in the preparations, and I have been asked to help out with coordinating the ESA Student Outreach program. There will be plenty of opportunity to solicit various companies to sponsor and/or participate in the SSP. As the CASI Astro conference will be held concurrently with the IAC, it remains to be seen whether we can host another National Space Awareness Workshop (NSAW).

Seasons Greetings

Finally, as this is the last issue of *Cosmonotes* for 2003, on behalf of the new CAISU Executive I would like to wish everyone the very best for the festive season. Happy holidays…and *ad astra*!

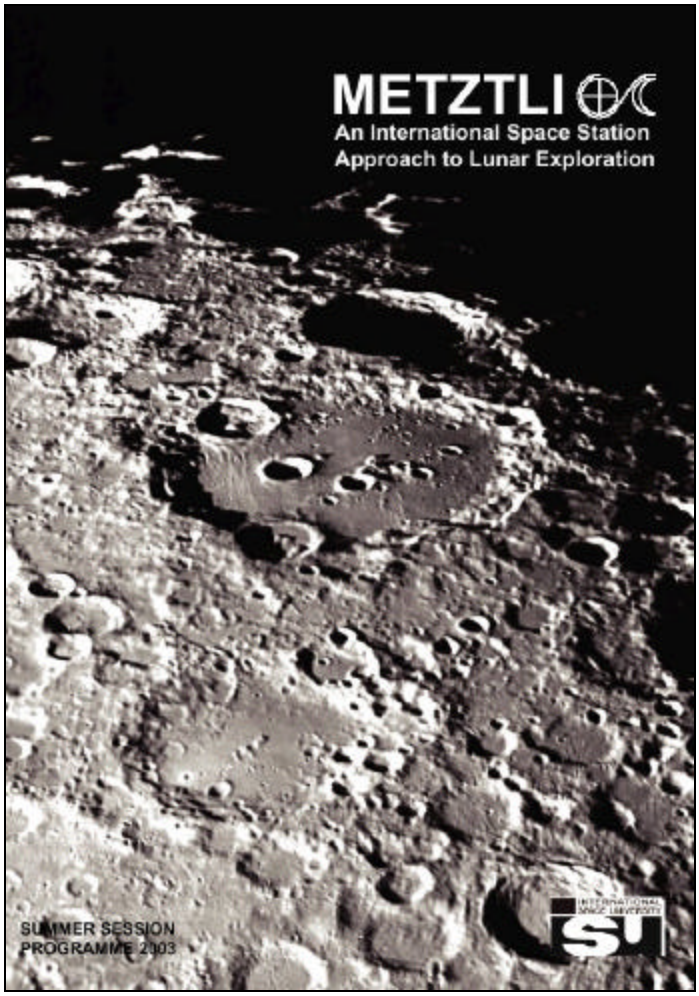
Credit: Kayser-Threde

SSP'03 Team Projects

Metztli: An International Space Station Approach to Lunar Exploration

By Tim Poon (SSP'03)

Forty-six students from twenty different countries analyzed bold new ways to travel to the Moon in the 2003 ISU Summer Session. The *Metztli* ISU Team Project assessed the capabilities of the International Space Station (ISS), its assets, infrastructure, and organization to support a program of lunar exploration and development.



Credit: ISU

The Moon has been a source of inspiration for humans since we first gazed skyward and contemplated the passage of day and night. It is truly constant, always displaying the same features and patterns as it continues its cosmic dance with our home planet. Every civilization in human history has built stories around the existence of the Moon – from the Chinese Chang'e to the Greek Artemis to the Aztec Metztli from whom this project draws its name. The forty-six team members created a useful and relevant analysis to assist future explorers, engineers, and space agencies.

The Results

While the project analyzed how the ISS could be used in a lunar exploration and development program, the team members quickly realized that this was a broad goal. A "bottom-up" approach was implemented, where the team laid out a baseline lunar program leading from the present to a future human presence. The program begins with research that can be accomplished in Earth-based efforts such as NASA's INTEGRITY (Integrated Human Exploration Mission Simulation Facility) project, ESA's Aurora program, and studies on parabolic aircraft flights.

The scope then moves outward to encompass the possibilities in low-Earth orbit (LEO), cislunar space, lunar orbit, and finally the surface of the Moon. The focus of this activity is on those scientific and engineering questions that bear on the ability of humans to live and work in extreme environments, such as the characterization of the cislunar radiation environment, medical studies on the effects of reduced gravity on human physiology, and our ability to use the Moon's resources to survive on its surface. Once the contextual framework was established, the team explored how the ISS program could be used to contribute to international lunar exploration.

After the current capabilities were examined, the team presented a creative method of using ISS hardware to enable lunar exploration and development once the station's current mission is over. The concept of moving some or all of the ISS into various different orbits and how that could be accomplished (including the supporting capabilities that would need to be developed) was exciting to many of the team members and that path was examined. The team determined that while further technical analysis is required, the report offers sufficient ideas and numerical analyses to warrant further in-depth analyses of these possible uses of the ISS.

Finally, an engineering solution is not useful to a policymaker without the corresponding context in a number of areas such as cost, legal issues, management structures, and risk analysis. The team performed an extensive financial and legal analysis of future ISS-related lunar plans, and offered suggestions and recommendations.

The Team

While the technical and policy analysis was significant, the most rewarding part of the team project was the motivation and the energy of the team members. We had backgrounds from all walks of life, from practicing lawyers to medical physicians to architects to senior aerospace managers. The talents and the skills of the forty-six team members was diverse and contributed to the necessary interdisciplinary nature of this project.

The team project was greatly assisted by the Canadian SSP delegation. Five Canadians participated in every step in the team organization and planning. We were involved in the management team for the project, as well as the development of the baseline lunar program. The Canadians also contributed to the project's analysis on telecommunications, as well as a survey on structures and radiation. We also looked at the health aspects of lunar missions, such as psychological issues and medical operations.

The Future

The team's analyses have been commended by staff at NASA INTEGRITY and others. Team members have also endeavoured to disseminate the results to relevant organizations and space agencies. The project was recently presented at the 2003 International Lunar Conference in Hawaii. Given the recent renewed international interest in lunar exploration expressed by China, Japan, Europe, India, and the United States, we hope that our report will further stimulate new interest in the exploration of everybody's favourite natural satellite – the Moon!

TRACKS to Space – Technology Research Advancing Cooperative Knowledge Sharing

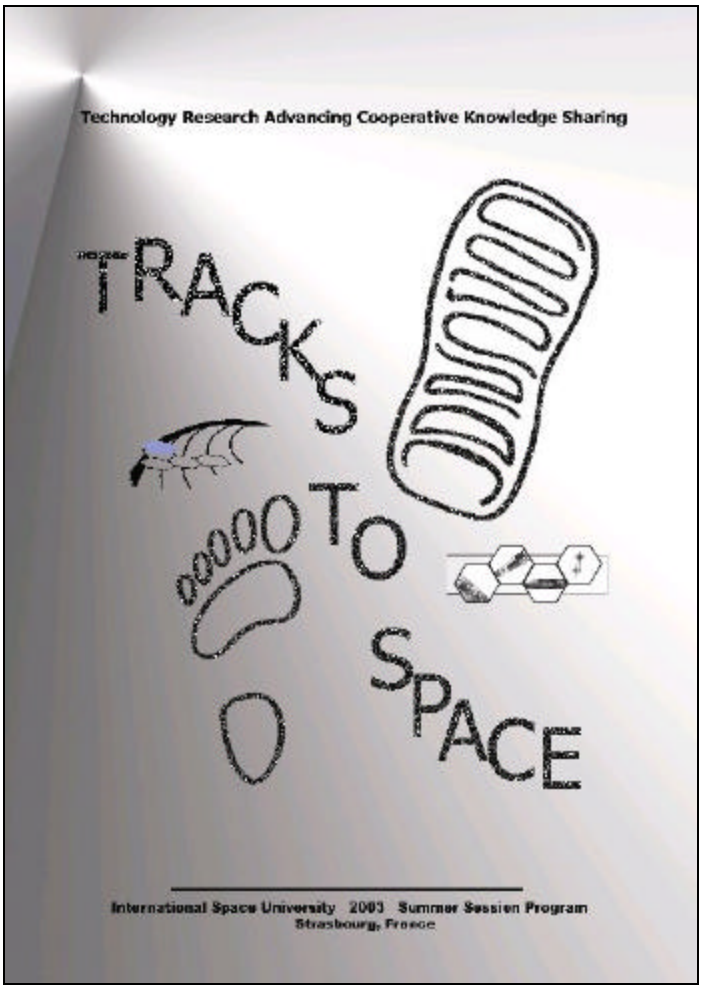
By Arthur Prévot (SSP'03)

First the first time, three team projects were offered to the SSP students. Amongst all of us, 33 made a very good choice and worked on what was originally referred to as "TP Technology", which later became *TRACKS to Space: Technology Research Advancing Cooperative Knowledge Sharing*. It was also the first time that a team project was carried out under a contractual framework. As pioneers, the team decided to set new rules and follow its own 3I approach ("Inspiring, Intriguing, and Important") to best serve its customer, the European Space Agency (ESA). This team project can be considered as a pilot program. It presents ways that technology mapping may be used as an operational tool for space agencies to develop inter-agency cooperation in space technology R&D.

The Report

The aim of the team project was to survey and map space technology R&D efforts among the civilian space agencies of China, Japan, Russia, and the United States. Surveying consisted of identifying each country's main space policies and strategies, explaining how they handle innovation in space technology, and assessing cooperation potentials. Technology mapping consisted of listing (based on ESA classifications) each country's main missions and the technologies required to accomplish those programs.

In order for the report to be more than a long list of tables and raw data, the team decided to present case studies aimed at illustrating and understanding cooperation potentials among the four countries plus ESA. The three case studies selected were complementary in their scope at the technological and political level. The Exploration Mission Simulations case study showed how sharing test facilities could lead to better terrestrial experiments on Earth to benefit future human and robotic missions beyond low-Earth orbit (LEO). The World Space Observatory case study was an example of a science-based project developed to maximize cooperation with non-space-faring nations. Finally, the Integrated and Coordinated Use of Space Technologies for Refugee Camps case study identified key space technologies and political mechanisms to make better use of them.



Credit: ISU

Our report demonstrated the benefits of utilizing a common framework for surveying and mapping space technology R&D as a planning tool because it permits the identification of gaps, overlaps, and cooperation potential. To avoid duplicating technology-mapping efforts and to overcome data availability issues, the team recommends establishing a cooperative knowledge-sharing forum. The

team also believes that the process should be broadened to other players in the space industry.

The Organization

Having students from all of the surveyed countries was of great assistance. Interestingly, most of the 13 students from China chose this team project. Although most conditions were met to carry out the research, one was missing – initially, few people had a good insight into technology road-mapping. Fortunately, presentations by many experts allowed us to gain knowledge in this area.

Everybody's contributions were significant, including of course the Canadian one. A quick look at the report gives a good example of this. Indeed, the 100% Canadian made cover page could probably win an ISU team project cover award. Of course, we did more than the cover page. At one time or another, each of us became the coordinator of some committee. It is true that amongst the 33 team members, as many as 14 students had that title at some point, but not all of them were staying up overnight as we did to finish the report.

What's Next

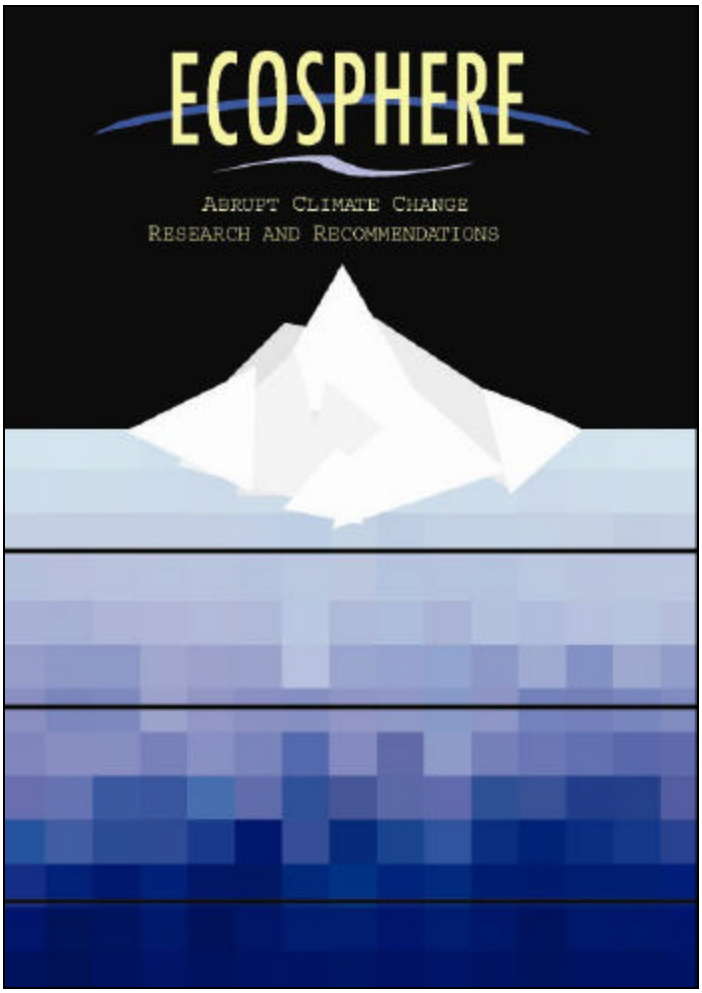
First, it is gratifying to know that our work was well received by ESA, and that ESA representatives are under discussions with ISU on potential future studies of this sort. Second, we would now like to push for our recommendations to be applied. We have agreed to present our work to the team members' national space agencies. At least two abstracts have been submitted for conferences, one being to SpaceOps 2004 in Montréal next May.

ECOSPHERE – Abrupt Climate Change Research and Recommendations

By Su-Yin Tan and Katrina Brandstadt (SSP'03)

Constituting six out of 28 project members, the Canadian SSP team made their mark with the ECOSPHERE team project at this year's ISU Summer Session Program in Strasbourg, France. Conceived as an organization for encouraging Earth Climate Observation Systems Promoting Human Ecological Research and Education, the *ECOSPHERE* project was designed to investigate the phenomena of the North Atlantic Ocean conveyor belt and abrupt climate change (ACC).

Although less exploratory driven than Metztli and with a lesser technological focus than TRACKS, ECOSPHERE was a project comprised of individuals who recognized the importance and potential benefits of space-based technologies for applications on Earth. Despite starting out with a common appreciation, the team soon discovered that the levels of knowledge and understanding of the ACC phenomena were highly variable in the group. In fact, only a few members were considered up-to-date with recent climatological research, with hardly anyone singled out as an "expert" on the subject. Consequently, our small team of students and professionals was faced with the unique challenge of first educating ourselves about the topic, in order to better reach and educate the general public. The team's tasks involved figuring out how to best inform and influence international organizations, governments, and the public about the complex topic of long-term ecosystem-climate interactions, the importance of environmental monitoring, and how to cope with impacts of possible future ACC scenarios.



Credit: ISU

The First Step

So began nine weeks of intensive research and education. Subsequently, the team's appreciation and knowledge of climate and its role within the Earth's ecosphere increased dramatically. The project's mission statement was: "To develop a framework to better understand the ACC phenomenon in the North Atlantic region through the application of space technology."

Driven by temperature and salinity differences, the major current system in the North Atlantic Ocean is generally

known as the thermohaline circulation system. It is also referred to as the ocean conveyor belt, the mechanism responsible for transferring thermal energy polewards from the tropics. Ocean monitoring is of particular interest, since the disruption of the ocean system could play a significant role in triggering an ACC event. For example, an abundance of freshwater input into the system caused by the melting of sea ice in a global warming scenario could significantly interfere with circulation patterns, resulting in cooler climate conditions in North America and Europe. The significant endangerment of ecosystems and serious socio-economic consequences brought about by an ACC event triggered in this area were what prompted the North Atlantic region to be the focus of our study.

In order to develop a framework for understanding ACC within the short duration of the summer program, the team's strategy involved a division of labour and identified tasks. Some students reviewed scientific literature on climate change and the North Atlantic conveyor belt system, sharing their findings with another group responsible for designing an integrated space-based global monitoring system dedicated to ACC studies. Finally, a sub-team of individuals was responsible for developing a public outreach plan for raising awareness of potential impacts of an ACC event. Consequently the report began to take shape, its organization corresponding to the team's management structure and integrating contributions from each sub-group.

The Proposed Program

ECOSPHERE's final report essentially serves three purposes. First, it is a resource of information about the North Atlantic Ocean conveyor belt and ACC. Second, the report constitutes a proposal for a comprehensive global monitoring program using Earth observation systems and an advanced ocean and paleoclimatic data collection program. Finally, it also serves as a handbook for governmental agencies and institutions, providing guidelines for educating the public about the science and potential impacts of an ACC event.

Central to the report is the proposal for an ACC-focused strategy within the European Global Monitoring of Environment and Security (GMES) program. The team recognized that the potential impacts of ACC would fit well with the GMES mandate relating to monitoring environment and global security, yet with a focus on Europe. Directed towards the 6th Framework Program (FP6) in the thematic area of "Sustainable Development, Global Change and Ecosystems", the proposal encourages GMES to gain international exposure by becoming a pioneer in ACC studies, enabling it to make a significant contribution to an issue of global concern.

ECOSPHERE's recommendations for technological systems architecture focused on three major challenges relevant to ACC, namely:

1) Measuring deep-sea salinity and ocean currents.

2) Improving the quality of ocean sediment paleoclimatic data.

3) Monitoring ice and ocean water salinity from space.

The corresponding three components of the proposed integrated technological program are the development of deep-sea robotic divers, ocean autonomous core samplers for deep-sea sediment collection, and a remote sensing program with payloads designed for monitoring sea surface salinity and ice sheets. For example, the Thermo Haline Explorer Autonomous Buoy Sea Submersible (THE ABYSS) is a particular technological innovation designed to take point measurements in deep regions of the ocean, going beyond the depths attainable with current technology. Another proposed design concept, the Autonomous Core Sampler (ACS) is intended for retrieving deep-sea sediment core samples at depths of up to 5 km. With robust and autonomous specifications, ECOSPHERE's proposed designs take advantage of several current space technologies, such as the ACS design that utilizes fuel cells originally used for spacecraft applications. Finally, a remote sensing program is also proposed, including payloads designed for enhancing ocean-monitoring capabilities, as well as communication payloads for supporting the ocean-based components.

In recognition of the importance of public awareness and education, an outreach plan formed an essential part of the proposed program. The envisioned outreach plan targets two main groups:

1) Government agencies, academia, industry representatives, and policymakers.

2) The general public.

Three implementation phases were proposed, consisting of the development of a political and scientific infrastructure dedicated to ACC, the deployment of a standard training approach in schools and universities through the use of multimedia, and the expansion into mass media venues to enable outreach programs to connect with the general public. Conferences dedicated to ACC studies and adaptation policies were also envisaged. Therefore, in order to be effective the proposal encompassed a comprehensive outreach plan aimed at embracing the key components necessary for raising public awareness about ACC.

Recognized Challenges

It is recognized that the full implementation of ECOSPHERE's recommendations faces a number of significant challenges. These include securing the funds required for ACC research within the GMES program, which is still in its initial developmental phase. Moreover, technological constraints may be problematic for the development of some of the technical solutions proposed, such as the microelectronic mechanical systems (MEMS) technology for deep-sea probes. Legal concerns may also arise concerning the environmental implications of the

widespread deployment of floaters and probes. In a broader context, the constantly changing nature and short-term political lifespan inherent to most governments sharply contrasts the necessity of a consistent and continuous approach for implementing ACC policies. Success of the proposed outreach program relies on a well-informed public that is capable of putting priority on the collective need of preparing for a possible ACC event.

What We Learned

In retrospect, ECOSPHERE turned out to be much more than a nine-week team project. It was a crossroad for young individuals convening and working feverishly together towards a common cause and ultimate goal. It also became a show of good cooperation and high team spirit. Staying true to ISU's 3Is, the project was interdisciplinary, international and intercultural in nature. The report was a collection of knowledge, innovative ideas, and recommendations for ACC research and education outreach, as well as a reflection of the team's hard work and perseverance.

At the end of the SSP, we departed Strasbourg and returned to our respective homes having gained an improved understanding and appreciation of what has happened in the Earth's history and what possible scenarios could occur as a consequence of climate change. With the publication of our final report and delivery of our final presentation, we are hopeful that our work will contribute towards heightening awareness of the sensitivity of our climate system. Recently, the ECOSPHERE project reached a wider audience with a presentation at the 54th International Astronautical Congress in Bremen, Germany in September 2003.

Our project upheld the belief that space systems and technologies should not exclusively focus on the exploration of extraterrestrial space, but can be used as highly effective tools for humans to analyze and potentially solve complex environmental problems on Earth. We encourage ISU to continue offering SSP team projects that apply space-based technologies to addressing terrestrial problems, and hope that our work and shared experiences will serve as inspiration to other team projects in the years ahead, spurring the creativity and innovation that are so inherent to the ISU experience.

A Post-SSP'03 Personal Reflection

By Ayodele Faiyetole (SSP'03/MSS'04, Nigeria)

Dedicated to the Class of SSP'03

It is no secret that I am still in Strasbourg after the end of the memorable SSP'03. There is no doubt that the presence of the over 200 space practitioners, students and lecturers alike in Strasbourg this summer indeed "cosmicized" the historically peaceful Alsacian region, as expressed in the closing speech by Prof. Yves Lavoinne, the President of the Pôle Universitaire Européen de Strasbourg, this year's SSP co-host of the highly intensive, interactive and innovative SSP.

I was recently at the CROUS-Gallia, the same restaurant where we normally had our Sunday dinner. But this time, I was not there for a meal. Instead, I went there to secure the possibility of occasionally having dinner in any of the many CROUS restaurants around Strasbourg, since the MSS students are currently cross-registered in Université Marc Bloch. As expected, I ran into the problem of effectively communicating with the receptionist and needed help from someone to correctly relay my message. On turning around to seek a translator, I opted for someone who seemed like he was a foreigner and a student like me and therefore, may have a higher degree of English knowledge. My strategy worked. However, I needed to tell him who I was and also my purpose for being interested in the CROUS meal credit card. To my surprise, upon hearing "ISU" he immediately the great institution from his previous encounters with students on the public tram. As the SSP'03 students and staff will recall, we almost always wore a highly recognizable identification badge, whether be it on campus or while commuting on the tram to and from the student residence known as the FEC.

Recently, I accepted the invitation of a newly found MSS'04 friend to attend a party with her. So we went, and the organizer, a co-tenant in an expensive residence in the Homme de Fer neighbourhood, was a gentleman student in one of the nearby schools. The party was already on and sure enough, my hostess did introduce me to a number of partygoers, whom she already knew in the neighbourhood. From there, we all went about exchanging pleasantries and trying to get to know each other. Questions kept coming from everybody's lips. Which country are you from? What school do you attend? My response often included the regular answers of Nigeria and ISU. Yet their reaction was not of surprise about what ISU stands for, but of interest and wanting to know more about the disciplines, what you can do with the degrees, the rocket launch, the robotics competition, the astronauts' panel, etc. Although it was against my plans, we ended up discussing late into the night as I educated them more about ISU and its philosophies and objectives.

I continued to live at the FEC residence for some days after the end of the SSP. The FEC management liked us

so much that they were interested in having me stay in the residence, despite the fact that all of the rooms were long booked by the incoming students for the present academic session. They still made a room available for me, but I needed to move after realizing that SSP and MSS were quite different programs, and that I would prefer not to have the long commute of going back and forth between the FEC and the ISU Campus. Yet in my short privileged post-SSP FEC days, it was obvious that the signs of the summer session were already starting to fade. The chairs and tables at the gathering point in the central courtyard are no more. The FEC has became a more serene residence, the entry code on the gate has been changed, there is no more crisscrossing of fellow SSP students in the halls and stairways, and a major renovation is continuing. The convenience store beside the FEC also feels the absence of the SSP students, and the staff has asked where they have gone. Also, not to forget my opposite window neighbour, the beautiful French/Madagascarian lady has asked to where the SSP students have all disappeared. The truth is that the charged atmosphere in FEC has lost much of its energy because SSP'03 had ended.

Right now, all one would see at the ISU Central Campus is a couple of MSS'04 students preparing for their first presentation on the space policy of selected developing nations. The environment is quiet and more academic. But what one no longer sees are the activities of the SSP'03 students this past summer, such as preparing to go to the CROUS for dinner, the football matches organized by Ned Jones (USA), or the games of Ultimate Frisbee that Avery Sen (USA) used to put on. There is also no need for Clint Clark (USA) to write another long e-mail, because the toilets are now so very clean and now I can understand Mathieu Gruber's response that the influx of people this summer had made cleaning unmanageable. Sure, the MSS is not about to listen to another space elites' panel discussion, at least not for now. The rooms are now quiet with silent printers and they are tidy with neatly organized chairs. There is no Jorge Epifanio (Portugal) or Vish Nangalia (U.K.) to awaken the quiet campus by either transforming a culture night into a toga party or turning a presentation into a fun fair. Also, there are no deadlines to meet for team projects and the popular Metztli "national assembly" meeting is no more – apologies to my good friend Tim Poon (Canada), the enviable Secretary General.

But what one would see is the same dedication shown by the staff, although Frauke Schmitzdorff (Germany) is gone with all the temporary staff, but the permanent staffers are still working very hard for both the SSP and MSS programs. What I discovered is that ISU is a place to study and that the MSS is a program for students who thirst for more in-depth knowledge of the space industry. To earn an MSS in the city you once cosmicized would surely add even more flavour to your résumé. There is definitely a difference between the SSP and the MSS!

I now live just a 10-15 minute walk away from the ISU Campus. At the end of SSP'03, it was so hard to say goodbye, but remember to always create more "space" because we've got the space! For me, it was a shock, because I had never imagined being in such an international setting so soon, never thought of sitting in the same hall with world-class experts, never to have imagined chatting with Japanese astronaut Dr. Chiaki Mukai. I feel highly envious of everyone's energy and enthusiasm. The maturity shown by young and brilliant minds like Yuki Takahashi (USA) was unfathomable, as was the sense of national pride displayed by the Canadians and Americans that I witnessed first hand. The gentleness of my fellow African Aïmad Bouarraki (Morocco) was worth emulating, as was the intellectual prowess of Peter Martinez (South Africa), who an excellent friend that honourably dubbed me the third co-chair of the TRACKS team project. No wonder everything more on so fine for them from the start! Ulrich Beck (Germany), the perfect organizer and an excellent friend, remember the success of the popular Bavaria trip – hitting Derrick Eckardt's (USA) Top 10 chart! The general understanding of Jon Lenius (USA), Kurt Klaus' (USA) warmness, the soundness of Su-Yin Tan (Canada) – indeed, a world class! The soulfulness of Young-Sook Lee (South Korea); I will always remember her songs. I could go on and on, since everyone had an attribute to cherish. Meeting with you, discussing, dining, and working with 108 incredible people two months served as an inspiration for my life, a time to learn, and an experience of a lifetime. But I can assure you the future can only get better for the "space" that I have now. So keep spacing for space…and don't stop!

Credit: Eric Choi

The Alumni Contacts Database

By Peggy Finarelli, ISU Vice-President for North American Operations

Finally, there is an Alumni Contacts Database on-line at the ISU website. It is password-protected and available only to alums. This has been a long time coming, but I think it's a major step forward in enhancing the effectiveness of the alum network.

For starters, we've populated the database with information from our general ISU database. However, for a given alum's information to show up in the alumni database, he or she needs to go to the ISU website, validate his/her data, and give approval for that data to be made available to other alums. To make it easier, there's a link to the alumni database on the ISU homepage (www.isunet.edu). First-time visitors will get a prompt to obtain a>username and password. As soon as they receive that, they can get into their file, update it, and approve its availability to other alums.

Please spread the word and encourage your fellow Canadian alums to activate their database information. The system is only as useful as the info it contains. The alumni community needs all of you Canadians in there!

ISU Success Stories

Earlier this year, the Canadian Institute for Health Research (CIHR) reduced their sponsorship to only one SSP scholarship, down from two. The CIHR scholarship budget was dramatically cut by more than 50%, so CFISU was lucky to retain the one scholarship. This makes the thank you letters, success stories, and testimonials of Canadian ISU alumni all the more important. In his capacity as CFISU Liaison, David Phillips (MSS'01) has been collecting as many success stories as possible to show current and prospective sponsors the advantages of supporting ISU students. Here are two of them:

Ryan Kobrick (MSS'03)

The amazing opportunities I experienced this fall grew from the foundation I received during the my MSS studies and the generosity of the European Space Agency (ESA), who sponsored partial tuition. This eventuated in my participation in ESA's First Aurora Design Contest in Barcelona, Spain, and more recently my participation in the Fifth Student Program at the 54th International Aeronautical Congress (IAC) in Bremen, Germany. The opportunities generated from an agency that has adopted Canadian students is a testament and ideal model for international cooperation. Without ESA's financial support I would have never attended ISU because of the expensive tuition and that would have been a tragedy. All ISU alumni feel passionate about the school and I am no different. Thank you ESA.

There was tremendous interest at ISU in the Aurora Student Design Contest, and thus our team (myself with Sarita Dara from India, John Burley from the UK., and Stuart Gill from Canada) decided to direct our ideas into the Human Missions Category even though it consisted of mainly new technologies. Our idea was a two-part proposal including a space-based centrifuge coupled with virtual reality and an exercise bicycle and also a training program to answer the medical questions before the use of such a device in space. The name of our proposal was the H-STRAW Project, and the device in our technical section was called ViGAR (Virtual Gravity Artificial Reality). Our project made it to the final round and Stuart and I presented our project in Barcelona on September 8. We won a special prize, which was a choice between a trip to Europe's spaceport in Kourou, French Guiana, or a visit to an international conference (e. the 2004 IAC in Vancouver). Images and more information can be found at my personal website (http://www.personal.psu.edu/users/r/l/rlk193/hstraw.htm). This contest brought together bright minds from universities across Canada and Europe and generated many possible mission scenarios and technologies. This contest provided an excellent forum for generating a "think tank" for the future exploration of the Universe.

Bremen, Germany was definitely the climax of the outgrowth of my ISU experience. Selected to participate in ESA's Student Program, I was proud to represent both of my nations (Canada and the United States). I prepared a poster from my ISU internship with co-founder Peter Diamandis and the X-Prize Foundation. My internship was to develop a follow-on competition for called the X-Prize Cup. Peter was not able to come to Bremen to present, and I approached the chairs of the session with the possibility of presenting on behalf of the X-Prize Foundation. The presentation was well received by the audience and I was grateful to have had the opportunity. John had prepared a H-STRAW Project poster for the IAC as part of his abstract submission. We stood guard and answered questions during the official poster session and generated a lot of interest in our countermeasure proposal. I would personally like to encourage the CSA to support Canadian students to attend IAC 2004, especially since it will be on home turf in Vancouver. Hopefully I will be there on stage again or running around collecting free epileptic causing pins and goodies!

Currently, I am at Pennsylvania State University working on a masters degree in aerospace engineering. I am attempting to explore funding and focus for my thesis, which will reflect my interdisciplinary experience thus far and lead to eventually to the completion of a Ph.D. I am interested in human spaceflight technology since my major life goal is to go into space and as many times as

possible. Who doesn't want to be an astronaut? I will keep pursing my goals, as the path that they have led me so far is one that I would never change!

Erik Viirre (SSP'88)

I was the first recipient of the MRC Fellowship for ISU at the inaugural SSP at the Massachusetts Institute of Technology (MIT) in 1988. The ISU experience has been the capstone of my career in medicine and medical research. I also think that it has been instrumental in improving the health of Canadians. Recently, I was discussing the funding for the development of medical technology that will be used for treatment of inner ear disorders. This technology that I have developed as a consequence of my work on inner ear disorders that was strongly facilitated through my experience at ISU.

Beyond this technology, I have been a faculty assistant and lecturer at ISU, received funding for biomedical technology development at NASA, sat on an integrated product team committee for review of neurological conditions of spaceflight, given a recurring lecture program on the biomedical aspects of spaceflight at Berkeley, designed virtual reality experiences for altered motion states that has applications for patients, become a medical advisor for Zero-G (a company that will provide microgravity experiences aboard parabolic flights) where I am reviewing medical certifications for flights including for persons with disabilities. I have also communicated with Rick Hansen on this latter opportunity.

So, I have directly benefited in training at ISU, carried out medical research, done medical technology development and made numerous contacts, and even met Arthur C. Clarke in 2002! This would not have been possible without the MRC Fellowship, as I would not have attended ISU otherwise.

Space Summit 2003

By Gary McQueen, President of the Canadian Space Society

On October 4, 2003 (the 46th anniversary of the launch of Sputnik 1), a group of space enthusiasts met at the Holiday Inn Yorkdale in Toronto to discuss an issue near and dear to our hearts – space, and how to get there. Space Summit 2003 was the follow-up to two previous successful summits held in 2000 (Toronto) and 2001 (Kingston). The aim of the summits are to gather members of the various space interest groups to discuss ways in which we can work together toward our common goals of getting people into space. The day started out with speakers on various topics related to the Canadian space industry. These talks were intended to energize the audience in preparation for the afternoon session, in which focus groups would brainstorm on how space enthusiasts could best assist in furthering Canada's participation in space exploration. The speakers were:

- Keith Henson – Lessons Learned in Growing a Space Advocacy Movement
- Eric Choi, MD Robotics (SSP'99 & '03) – The Phoenix Mars Scout Mission
- Henry Spencer, SP Systems – Canadian Microsat Planetary Missions
- Ben Quine, Thoth Technology – Northern Light Canadian Mars Lander

Credit: Nick Balaskas

After lunch, the summit participants were divided into two groups. One team brainstormed ideas on how we can work together to increase the effectiveness of Canadian space advocacy, while the other concentrated on generating ideas on how to influence government policy. Each group took approximately ten minutes to brief the summiteers on what they came up with for "next steps".

Here are their results:

1) Personal Appointments with Members of Parliament – All attendees were encouraged to meet with their respective MPs in order to push the space agenda. The group suggested that we go in pairs where possible, and to contact the member well in advance and let them know what will be discussed.

2) Our Message – The Government of Canada has pledged to innovate rather than replicate. This policy must also be applied to space. The need for our country to continue to be innovative in space is essential to the future prosperity of all Canadians.

3) Reference Material – There should be a briefing book prepared so that people are armed with information before meeting with their MPs.

4) Contact Tracking – A database of MPs is needed so that we can track who has already been contacted.

5) Long-Term Goals – Aim to make space an issue in the anticipated Federal election. Finish the Canadian Space Advocacy website, link it with websites for scouts, cadets, museums, etc. in order to increase exposure to young people, and appoint a webmaster to each space advocacy group or society. Use the requirement for high school students to perform 40 hours of community service by getting students to spread the word to other students. They can do presentations, projects, etc. We can help by putting together reference material.

6) Seize Near-Term Outreach Opportunities – Focus on the early 2004 outreach opportunities spawned by interest in the Mars Express/Beagle 2 and Mars Exploration Rover missions. Try to get NASA TV into schools, and have a presence at conventions and conferences.

The summit also served to formalize a significant change that has occurred in Canadian space advocacy and the role of the Canadian Space Society. From discussions that started after the Mars Society of Canada's annual general meeting, the CSS will now be taking on the role of an "umbrella organization" encompassing other space interest groups. The details of what this relationship entails will no doubt evolve over the coming months, but essentially all groups will remain independent but with the CSS acting as a networking entity facilitating communication between groups. This is a significant step for both the CSS and the space advocacy movement within Canada.

All the summiteers agreed that the Space Summits should continue on an annual basis. Planning for Space Summit 2004 will start soon. If you wish to help out with organizing this event, please contact me at gary.mcqueen@utoronto.ca

CAISU Alumni Updates

Joan Saary (SSP'01)

In September, Joan was selected as the winner of the 2003 Alice Wilson Award by the Royal Society of Canada and the Canadian Academy of the Sciences and Humanities. The Alice Wilson Award was established to honour the memory of the first woman elected to the Society, Alice Evelyn Wilson, in 1938. This award, which consists of a diploma and $1,000 cash, is given annually to a woman of outstanding academic qualifications who is entering a career in scholarship or research at the postdoctoral level. The award was presented at the Royal Society of Canada's awards banquet that was held on November 24 at the National Gallery of Canada.

Roland and Audrey Seurig (SSP'91 & '01)

Until very recently, Audrey had been working as a scientific consultant for Kayser-Threde in Munich, Germany, contributing to the Biotechnology Mammalian Tissue Culture Facility (BMTC) Phase A Study for ESA. Roland and his team just won Phase B of the MPACT (International Microgravity Plasma, Atmospheric, and Cosmic Dust) facility, which is destined to be the premier research laboratory for plasma and dust physics on the International Space Station. The scientists are developing experiments ranging from dusty plasma manipulation to improve production processes for solar panel manufacturing, to the understanding of the formation processes of the planets, as well as the investigation of the underlying physical processes of scavenging pollutants in our Earth's atmosphere. Audrey and Roland are planning to visit their friends in Canada this coming January.

Chantal Lamontagne (SSP'95 & '96)

Chantal completed her Ph.D in aerospace engineering at the University of Toronto Institute for Aerospace Studies (UTIAS). She celebrated by promptly fracturing her ankle minutes after handing in her thesis, followed by all the lights going out for millions of people (literally!). Several casts, crutches, and braces later, she finally became somewhat mobile. She and her husband recently enjoyed a delayed trip to the beautiful Mayan Riviera. Chantal is currently seeking employment, and can be reached at lamontagnec@rogers.com

Kevin Forkheim (SSP'96)

Kevin successfully completed his radiology residency training in June. He spent the summer completing positron emission tomography (PET) fellowships at the Duke Medical Centre and the Washington Medical Centre. Kevin will be staying on at the University of British Columbia for one additional year to complete a joint residency in nuclear medicine.

Valery Tessier-Leon (MSS'00)

Valery recently started a new position at the Washington, DC office the French space agency CNES. She had previously been working at the NASA Johnson Space Centre in Houston, where she did planning work for the International Space Station along with working real-time operations at the ISS safety console.