



FBW09

CANEUS
FLY-BY-WIRELESS
WORKSHOP 2009

June 8-12, 2009 Montréal, Quebec

www.caneus.org/fbw09

Final Program



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WELCOME FROM CANEUS INTERNATIONAL

Dear Workshop Participant:

Thank you for participating in the 2nd CANEUS Fly-by-Wireless Workshop! On behalf of CANEUS International, we are very pleased to host this workshop in Canada and extend a warm welcome to you and urge you to participate fully in this event. I am sure this will be a very worthwhile and productive event.

CANEUS' primary mission is to rapidly and cost-effectively bridge the mid-TRL "Valley of Death" for transitioning emerging micro-nano technologies to aerospace systems, thereby enabling next generation missions with advanced capabilities. Since the nature of these transitioning projects varies on a project-by-project basis, CANEUS has put in place an extremely "lean" and flexible core organization to create the collaborative virtual organizations necessary for the advocacy and ultimately the manufacture and demonstration of specific MNT-based systems for aerospace end users.

CANEUS adds value by bringing together its global network of professionals with complementary skill-sets, from the low TRL researchers to the mid-TRL system developers and the high-TRL system testing, integration and reliability assurance personnel. As the premier advocacy organization for aerospace MNT system development, CANEUS has gained the trust of both private and government sponsors as a reliable, due-diligence body for vetting and "packaging" system development projects to minimize the investment risks by these sponsors.

Potential MNT system development projects are proposed, defined, and peer-reviewed by the CANEUS advisory committees for completeness and soundness, prior to submission to potential sponsors for funding. CANEUS Workshops, such the FBW09, offers the forum to network and discuss these projects, and to form the teams that will be responsible for the generating the system-level end products.

One of the most compelling reasons to participate fully in CANEUS, is to have the many opportunities to collaborate across organizations, and, if necessary, across international boundaries, on these high-risk, high-cost system development projects that are beyond the resources of any single organization. In essence, effective risk mitigation can be achieved under the auspices of CANEUS for the generation of new intellectual property.

The primary cause for the failure of a great majority of emerging technology development projects in their inability to make the transition to system level is because these projects have been largely developed in response to the inventors' vision, i.e. a "technology push" approach, and therefore stand the great risk of wrongly predicting customer demand. CANEUS overcomes this key transitioning challenge by first determining if a sustainable customer base exists for the proposed system, in other words, CANEUS uses a "technology pull" approach instead to evaluate the economic viability of a specific project prior to embarking on the development effort. The system need could either be an existing customer need, or a need that is created as a result of CANEUS' advocacy activities with potential customers and end-users.

Because CANEUS activities, by necessity, have to span the continuum of technology development and commercialization, CANEUS projects could be conducted in either a small, focused collaborative group effort approach or, alterna-

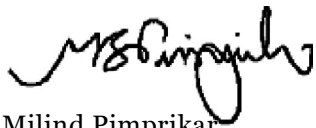
tively, as a much larger, consortium-style, development of precompetitive intellectual property that is subsequently licensed by several aerospace companies and other organizations that see the benefit in mitigating their risk for expensive, high-risk, high-payoff technology development. It is then highly probable that these precompetitive developments will spawn a host of proprietary development projects within the licensee organizations.

The topics covered at CANEUS FBW09 workshop are very much synergistic with the activities and mission of CANEUS. The Workshop has an exciting program consisting of three days of workshops, networking opportunities through social gatherings and exhibits designed to define and implement plans to infuse next-generation technologies within various aerospace industry segments.

As you are meeting at this workshop, the Aerospace industry worldwide is facing a major crisis: How to keep its new technology pipeline for future missions from drying up? The CANEUS FBW09 Workshops emphasize measurable deliverables with lasting impact for the aerospace industry. Workshop participants will collectively prepare implementation plans for well-defined projects, and identify new project concepts.

As a valued participant, it is critically important that you interact with speakers, poster session presenters, and other participants and provide your vital input to improving and thereby strengthening our mission.

It is our sincere hope that you will benefit tremendously from your participation and that you will have a technically, professionally, and socially enriching experience.



Milind Pimprikar
Founder and Chairman
CANEUS International

WELCOME FROM THE 2ND CANEUS FLY-BY-WIRELESS WORKSHOP CHAIRS

Dear Workshop Participant:

As Chair and Co-Chairs of the 2nd CANEUS Fly-by-Wireless Workshop, it is our pleasure to extend a hearty welcome to all workshop participants! We are very pleased to host this important event, which we believe addresses a critical need for the aerospace industry. The aerospace industry need an infusion of new technologies and systems, which we believe can be particularly influenced by exciting worldwide developments in Sensor DAQ Micro-Miniaturization, Passive Wireless Sensor Tag, Less-Wire Architectures, Structural Health Monitoring, and Wireless systems immunity in Electromagnetic Environment (HIRF, Lightning etc).

Given that the entire aerospace market sector is relatively small and specialized, while yet needing a broad spectrum of enabling technologies, CANEUS' approach of creating SEMATECH-like collaborative consortia has gained worldwide recognition as an innovative approach to marshal and focus our limited and constrained resources.

Canada is pleased to host this 2nd CANEUS "Fly-by-Wireless" workshop with support and participation of:

- Institute for Aerospace Research of the National Research Council of Canada
- Ministry of Industry, Government of Canada
- École Polytechnique de Montreal
- Canadian Space Agency
- Bombardier Aerospace
- Pratt & Whitney
- Department of National Defence
- Regroupement Stratégique en Microsystème du Québec- Microsystems Strategic Alliance of Québec
- CRIAQ

The CANEUS FBW09 Workshop is unique and different from many conferences and workshops, in that it emphasizes measurable deliverables with lasting impact for the aerospace industry. Participants of the CANEUS FBW09 Workshop will collectively prepare implementation plans for well-defined projects, and identify new project concepts. The end result will be a neutral virtual business model for international collaboration that brings the best solutions to the boardroom so that well-informed decisions on new program starts,-whether it be research, test and evaluation, or introduction of new products to the end user- can be made quickly and confidently.

WORKSHOP CHAIR

Roy Vestrum
Institute of Aerospace Research
National Research Council Canada

TECHNICAL CHAIRS

Jim Castellano
Aerospace, Defence and Marine Branch
Industry Canada,
Government of Canada

Nezih Mrad
Air Vehicles Research Section
Defence R&D Canada
Department of National Defence

HOST CHAIR

Jules O'Shea
Département de génie électrique
École Polytechnique de Montreal

David Russel
Institute of Aerospace Research
National Research Council Canada

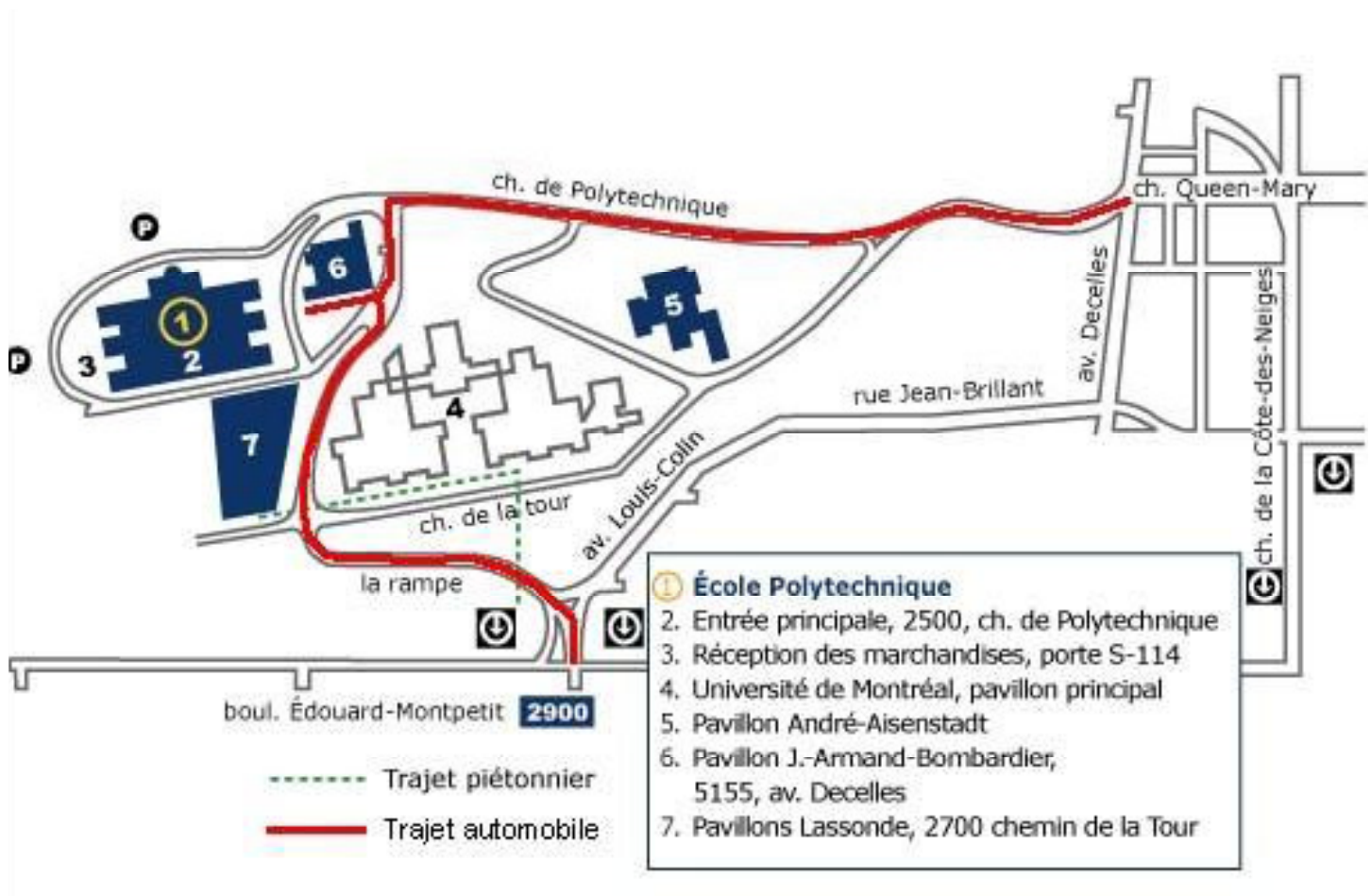
Wanping Zheng
Canadian Space Agency

SCHEDULE

	Monday June 8	Tuesday June 9	Wednesday June 10
	Plenary & End User Briefings	Technology Provider Briefings	Project Development, Implementation and Success Criteria
07:30-08:30	Registration		
08:30-09:00	Session 1 Welcome, Introduction and Workshop Overview	Keynote Address Fu-Kuo Chang SCL Stanford University	Keynote Address Bob Walker DRDC-DND
09:00-09:30		Session 7 Sensor DAQ Micro-Miniaturization Passive Wireless Sensor Tag Less-Wire Architectures	Session 11 Overview of Projects
09:30-10:00	Keynote Address Mairead Lavery (TBC) Bombardier Aerospace Montreal		
10:00-10:30	Coffee Break	Coffee Break	Coffee Break
10:30-11:30	Session 2 Raison d'être of FBW Consortia & Projects	Session 8 Sensor DAQ Micro-Miniaturization Passive Wireless Sensor Tag Less-Wire Architectures	Session 12 Funding Opportunities
11:30-12:00	Session 3 Overview of Key Issues (IP, Funding, NDA and Export Control)		
12:00-13:30	Keynote Address + Lunch Radoslaw R. Zakrzewski Goodrich Corporation	Keynote Address + Lunch Radislav A. Potyrailo GE Global Research Center NY	Keynote Address + Lunch Sherry Noble Export Development Corporation
	End User Briefings	Technology Provider Briefings	Project Reports
13:30-14:00	Keynote Address Victor Giurgiutiu Air Force Office of Scientific Research (AFOSR)	Keynote Address Tribikram Kundu University of Arizona	Keynote Address Duane Cuttrell LMCO - Skunk Works
14:00-15:00	Session 4 Structural Health Monitoring + Round-table Discussion	Session 9 Structural Health Monitoring Instrumentation Wireless systems immunity in Electromagnetic Environment	Session 13 Project Success Criteria Linda Beth Schilling and Frank Barros ATP-NIST, Dept. of Commerce, USA
15:00-15:30	Coffee Break	Coffee Break	Coffee Break
15:30-16:00	Keynote Address John McGraw FAA	Keynote Address Minoru Taya University of Washington	Session 14 Project Summary
16:00-17:00	Session 5 Passive Wireless Sensor Tag and Sensor DAQ Micro-Miniaturization + Round-table Discussion	Session 10 Structural Health Monitoring Instrumentation Wireless systems immunity in Electromagnetic Environment	Session 15 CEO/CTO Expert Panel Discussion Chairs: Suzanna Benoit (TBC) and John Legette (TBC) Panelists: Adarsh Deepak , Jacques Daoust (TBC), Phil Dion (TBC), and Henry Rothschild (TBC)
17:00-17:30	Session 6 Wireless systems immunity in Electromagnetic Environment (HIRF, Lightning etc) + Round-table Discussion		Conclusion
17:30-19:00	Student Poster Session + Wine and Cheese	Student Poster Session + Wine and Cheese Banquet Keynote Address Francois Caza Bombardier Aerospace	Project Group Leadership Dinner

	Thursday June 11	Friday June 12
	Technical Tours	Technical Tours
AM	Canadian Space Agency	CAE Electronics Simulator
	Technical Tours	Technical Tours
PM	Bombardier Aircraft Manufacturer	Air Canada

WORKSHOP LOCATION



PARTIAL MAP OF THE UNIVERSITY OF MONTREAL CAMPUS

The entire program of the 2nd CANEUS Fly-by-Wireless Workshop will be held at the

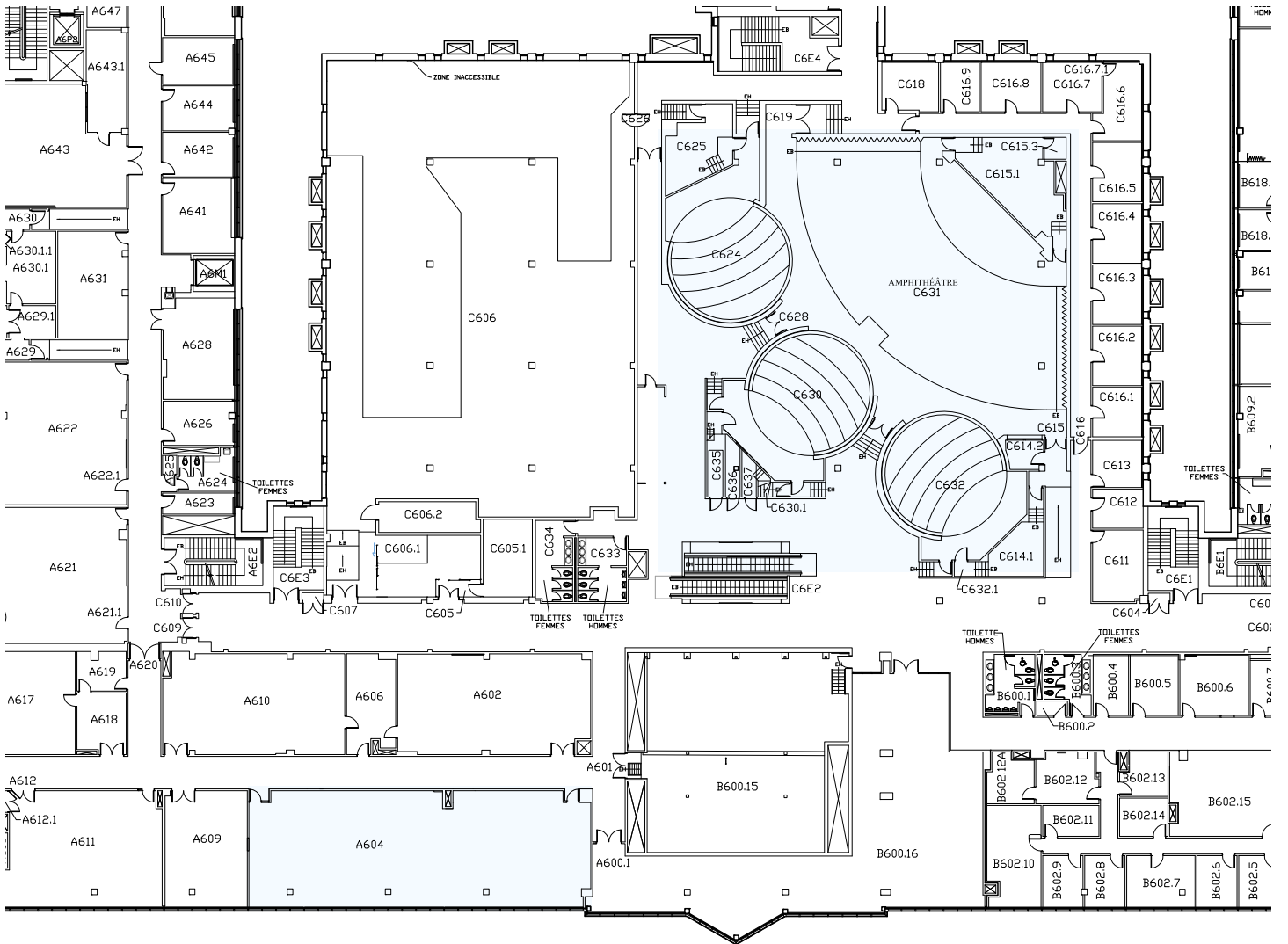
École Polytechnique, located on the campus of the University of Montreal.

There are two entrances to the campus; one corresponds to the civic address 2900 Edouard-Montpetit boulevard and the other is at the intersection of Queen-Mary road and Decelles avenue. From downtown Montreal, traveling by car, one can reach the campus, which is on the other side of Mount Royal, by proceeding on Park Avenue (not shown on the map because it is too far on the left) or by Cote-des-Neiges road (shown on the right side of the map).

The workshop will take place in the main building of École Polytechnique (no. 1 on the map). Parking (\$13/

day) will be made available to participants inside building no. 6 on the map. It is the J.-Armand Bombardier pavilion (which was donated by the Bombardier family, the majority share holders of Bombardier Aeronautics). The red line shows how to reach the Bombardier pavilion from either one of the campus entrances. More parking places will be available under Pavilion Lassonde (building no. 7), if one so prefers.

Inside Pavilion Lassonde, there are escalators that lead to 6th floor where there is a short tunnel that links buildings no. 7 and no. 1. Building no. 1 is located still higher on the campus than building no. 4, so when coming out of that tunnel, one finds himself on the 1st floor of building no. 1. Then, walking straight ahead, one has to cross the cafeteria, after turn left and walk to an escalator which leads to the 6th floor (this time of building no. 1) right in front of the registration desk.



INTERNET CONNECTION

Wireless Card Configuration

1. The first step should be to verify that your wireless card is configured to obtain its IP address dynamically, using DHCP.
2. Then, select the wireless network «conference »

HTTP/HTTPS authentication

1. Open a browser window and go to the following address : <https://10.0.0.5> or <http://10.0.0.5>
2. Our firewall will ask you to identify yourself :
3. #Ecole Polytechnique de Montreal - Code conference requis - Conference code required”
4. You will have to use the following userID and password

UserID : **fbwwifi**

Password : **fbw2009**

5. You must leave the browser window <https://10.0.0.5> or <http://10.0.0.5> open to prevent re-authentication on a regular basis. You can start another window to navigate on the Internet.
6. You are now connected to the Internet

Telnet authentication

1. If you do not receive the authentication request after opening the browser window, you can perform a TELNET to : login.polymtl.ca
2. You can use the userID and password configured for this conference.
3. Now, you can open your browser and navigate the internet
4. You are now connected to the Internet

Wired network

1. The same procedure is used to access the wired network
2. You can use the userID and password configured for this conference
3. Now, you can open your browser and navigate the internet
4. You are now connected to the Internet

TRANSPORTATION

Public transit is well recommended; there is a subway station on the campus. Montrealers call their subway “Metro”. So, the Metro station on the campus is named “Université de Montréal”. It is located near the Edouard Montpetit campus entrance. On the map, the green dashed line starting from a black square with a circle and an arrow pointing down (the symbol for Metro stations) shows the way for pedestrians to get to Ecole Polytechnique. Leaving the Metro station, there is a tunnel that goes up to the main building of the University (no. 4) (which is located on the flank of Mount Royal), then one has to walk outside along that building to pavilion Lassonde (no. 7) which is part of Ecole Polytechnique. We will have signs directing workshop participants once in the metro station.

Montreal Public Transportation

Public transport is a great way to see the city. Hop on the metro and in just 10 minutes you’re at a museum, restaurant or in Old Montréal. Affordable and reliable, the metro can be accessed via the city’s Underground Pedestrian Network: two of the four main lines connect downtown to major tourism sites as well as to numerous bus stops and train stations.

<http://www.tourisme-montreal.org/Travel-Information/Getting-Around-Montreal>

Metro operating hours are Monday to Friday and Sunday from 5:30 a.m. to 1 a.m., and Saturday from 5:30 a.m. to 1:30 a.m. The average wait time between trains is eight minutes and three minutes during rush hour.

For more information about public transportation in Montreal, please visit: www.stm.info.

From Montreal PET International Airport

1. Start out going NORTH on BOULEVARD ROMÉO-VACHON N.
2. Turn SLIGHT LEFT toward ARRIVÉES/ ARRIVALS/ VALETPARC.
3. Stay STRAIGHT to go onto BOULEVARD ROMÉO-VACHON N.
4. Turn SLIGHT LEFT toward AUT-20/ AUT-520/ MONTRÉAL/ AÉROGARE/ TERMINAL/ STATIONNEMENT/ PARKING.
5. Turn SLIGHT LEFT onto BOULEVARD ROMÉO-VACHON S.
6. Turn SLIGHT RIGHT onto CHEMIN CÔTE-DE-LIESSE.
7. CHEMIN CÔTE-DE-LIESSE becomes AVENUE MICHEL JASMIN.
8. Turn SLIGHT LEFT to take the AUT-520 E/ AUT. CÔTE-DE-LIESSE ramp toward AUT-40.
9. Merge onto AUTOROUTE 520 E.
10. AUTOROUTE 520 E becomes CHEMIN DE LA CÔTE-DE-LIESSE.
11. Turn SLIGHT LEFT to take the ramp toward AUT-40 E/ AUT-15/ AUTOROUTE TRANSCANADIENNE/ RTE-117 N/ QUÉBEC/ AUT. DÉCARIE.
12. Turn SLIGHT LEFT to take the AUT-40 E/ AUT-15 N ramp.
13. Merge onto AUTOROUTE 40 E/ AUTOROUTE TRANSCANADIENNE E.
14. Take the AUT-15 S exit, EXIT 66-S, on the LEFT toward AUT-10/ MONTRÉAL/ CENTRE-VILLE/ PONT CHAMPLAIN.
15. Merge onto AUTOROUTE 15 S.
16. Take EXIT 66 toward CH. QUEEN-MARY/ CH. CÔTE ST-LUC.
17. Stay STRAIGHT to go onto BOULEVARD DÉCARIE.
18. Turn LEFT onto CHEMIN QUEEN MARY.
19. Stay STRAIGHT to go onto CHEMIN DE POLYTECHNIQUE.
20. End at Chemin De Polytechnique Montréal, QC H3T

Estimated Time: 21 minutes

Estimated Distance: 10.12 miles

From Hotel Delta Centre-Ville Montreal

1. Start out going SOUTHWEST on RUE ST-JACQUES toward RUE UNIVERSITY
 2. Turn RIGHT onto RUE MANSFIELD
 3. Turn LEFT onto RUE ST-ANTOINE O
 4. Turn RIGHT onto RUE GUY.
 5. RUE GUY becomes CHEMIN DE LA CÔTE-DES-NEIGES.
 6. Turn SLIGHT RIGHT onto AVENUE DECELLES
 7. Turn RIGHT onto CHEMIN DE POLYTECHNIQUE.
 8. End at Chemin De Polytechnique Montréal, QC H3T
- Estimated Time: 11 minutes
- Estimated Distance: 3.43 miles

Airport Shuttle Service

Autocars Murray Hill (Subsidiary of Group Guaderault)

Telephone: 450 968-2450

Toll-free: 1 800 561-1210

Fax: 450 968-1087

E-mail: information@groupe-gaudreault.com

Airport transfers, city tours and shuttles are a breeze on these buses and motor coaches.

Taxi Service

If you prefer getting around by taxi, it's easy to flag one down on the street. You'll also find them at one of the city's many taxi stands or in front of most major hotels. A trip to the airport from downtown will cost you a flat rate of \$35— not including tip. A trip from the Hotel Delta / Maritime Plaza to the conference facility will cost you @ \$15 to \$20.

Diamond Taxi

Telephone: 514 273-6331

Toll-free: 1 800 716-6727

This company guarantees fast and courteous service 24 hours a day.

MONTREAL GENERAL INFORMATION

Please consult the following link for answers to most frequently asked questions about your travel and stay in Montreal

<http://www.tourisme-montreal.org/Travel-Information/FAQs>

By phone:

Montréal area: 514 873-2015

Toll free, from Canada and U.S.A.: 1 877 BONJOUR (266-5687)

Toll free, from United Kingdom: 0800 051 7055

In person:

Infotouriste Centre

1255 Peel Street

Suite 100 (corner of Sainte-Catherine Street West)

Peel

Tourist Welcome Office in Old Montréal

174 Notre-Dame Street East

Champ-de-Mars

Overview

MISSION

In March 2007, NASA and CANEUS teamed together to hold the first CANEUS/NASA “Fly-by-Wireless” Workshop in conjunction with the RFID World 2007 Conference. The objectives of the workshops were to communicate the CANEUS/NASA “Fly-by-Wireless” Vision and Project Partnering, develop cooperating Application/End User and Technology Provider Groups that intend to further the “Fly-by-Wireless” vision, and provide communication of results and additional opportunities for further development of cooperative work and partnerships.

The **2nd CANEUS “Fly-by-Wireless” Workshop** will stimulate formation of collaborative projects to meet Aerospace application/end user’s needs with the laboratory proven technology concepts that have significant mutual benefit and high potential of funding from internal or external organizations.

We have structured the 2nd CANEUS Fly-by-Wireless workshop to focus on projects being developed in each of the following major areas:

1. Aircraft / Spacecraft Structural Health Monitoring,
2. Sensor DAQ Micro-Miniaturization,
3. Passive Wireless Sensor Tag,
4. Less-Wire Architectures,
5. Wireless systems immunity in Electromagnetic Environment (HIRF, Lightning etc)

BACKGROUND

CANEUS International, as a non-profit organization, offers a rapid and cost-effective method of technology transition via the creation of international collaborative sector consortia. These international public/private partnerships between industry, university, and government stakeholders pool membership’s resources to define and execute high-risk, high-cost projects and initiatives. These Consortia constitute smoothly functioning development “pipelines” for emerging technology concepts.

The “Fly-by-Wireless” vision grew out of an identified need by the CANEUS 2006 Conference participants for a “Structural Health Monitoring project” of undefined nature.

The CANEUS Workshops serves as a tool to efficiently overcome the challenges associated with matching aerospace application needs with the new capabilities offered by emerging technologies. The workshop program emphasizes formulation of well-defined projects as measurable deliverables with lasting impact for the aerospace industry.

CANEUS currently coordinates Consortia dedicated to Small Satellites, Reliability, Fly-by-Wireless (with Structural Vehicle Health Monitoring), Devices (with Harsh Environment Sensors, Optoelectronics, and Environmental Monitoring), and Materials (with Micro-Energetics).

At this 1st CANEUS/NASA “Fly-by-Wireless” Workshop in March 2007, the right group of international end-users met and with the practical progress made since then, agencies and organizations from the USA, Canada, Europe, Brazil and elsewhere would like CANEUS to lead a

series of these workshops in hopes of generating mutually beneficial projects.

CANEUS began to further develop the cooperative organization to promote international projects from the workshops. The U.S. and participating international organizations have taken steps to continue development of their wireless programs and some teaming has resulted. Many have committed to participation in future Fly-by-Wireless (FBW) workshops, working groups, and projects, including EADS, ESA, Canada, Brazil, NASA IPP, and Aviation Safety Program.

OBJECTIVES

The 2nd CANEUS Fly-by-Wireless (FBW) Workshop Program will build on: (a) the vision, mission and goal defined at the 1st CANEUS/NASA Fly-by-Wireless Workshop held in March 2007 and (b) focus projects that were proposed and formulated at the Fly-By-Wireless Sector Consortium sessions held at CANEUS 2009 workshop at NASA Ames on March 1-6, 2009. The goal of the CANEUS 2009 Workshops was to significantly advance each of the CANEUS Sector Consortia by creating their roadmaps and articulating well-defined projects for the aerospace industry.

The 2nd Fly-by-Wireless workshop aims: to:

- a. refine the focus projects and pertinent details, identify specific development needs, outline teaming and funding schemes, plan project oversight and execution, and establish milestones from which to gauge success of the projects, and
- b. stimulate formation of project teams comprised of technology providers and application/end users and project proposals from each team that have significant mutual benefit and high potential of funding from internal or external organizations.

One of the focus projects that were defined at the NASA Ames Workshop deals with wireless implementation for structural health monitoring of the main fuselage. Such focused project, with well defined scope for a complete system solution, is supported by all stake holders including the customers and end users, and also entails a portfolio of technology requirements. It will further apply aspects of previously defined technology roadmaps from international agencies.

Over 200 world experts from the Americas, Europe, and elsewhere are expected to address the current and future needs of the aerospace industry, state of the art in SHM, sensors, wireless systems, government and private investment for collaborative project development, and policies such as ITAR and export control regulations that affect international collaborations.

The Workshops have a unique format which emphasizes, as its primary deliverable, the definition and implementation plans for technology infusion projects. During the workshop sessions of the program, participants in each of the 5 major topics will

- a. Identify projects important to their organizations;
- b. Define a project concept, be it a product development, a process development, or an initiative;
- c. Identify work teams; and
- d. Assign tasks and responsibilities to further develop these projects.

It is expected that this process of project definition and development will subsequently lead to the submission of teaming agreements and project proposals to the funding agencies, with cost estimates, a work breakdown structure, and proposed funding strategies.

EXPECTED OUTCOMES

DAY 1

After day 1 of the workshop participants should walk away with a clear understanding of the:

- workshop process
- CANEUS vision, mission, and goals
- project developments from past meetings
- relevant funding, IP, and regulatory considerations
- clear understanding of end-user and customer needs as related to:
 - Structural Health Monitoring
 - Passive Wireless Sensor Tag
 - Sensor DAQ Micro-Miniaturization
 - EMC- HIRF
- project concepts/ideas from end-user/customers that could offer potential solutions for identified needs

How do the activities on day 1 relate to the overall workshop objectives?

In order for us to understand how we can work together to establish fundable projects, we must first have a clear understanding of what we are working towards. What is the desired solution?

Having a clear understanding of end-user/customer needs, their desired initial applications, and their idea of potential solutions at the outset will help us to effectively scope project development activities. This will ensure that the projects established on day 3 are able to address a clear need and offer a potential solution to a “real” end-user or customer.

DAY 2

After day 2 of the workshop participants should walk away with a clear understanding of the:

- current technology and project developments of relevant Fly By Wireless technology providers
- maturity level of current technology developments
- state-of-the art or bleeding-edge technology concepts

How do the activities on day 2 relate to the overall workshop objectives?

From day 1 we now have a general idea of potential/desired solutions. Before we can work collaboratively to establish projects that address a solution we first need to understand what we are working with. What are the current maturity levels of cutting edge technology developments?

By hearing from technology providers developing new and cutting edge FBW technologies we can avoid re-inventing the wheel and can start to identify synergies amongst the technology providers that can become part of a solution set.

DAY 3

After day 3 of the workshop participants should walk away with a clear understanding of the:

- priority of government programs to fund and procure relevant FBW projects and technology developments
- selection criteria, metrics for assessment, project duration expectations, and transition or infusion strategies for these types of aerospace funding initiatives
- cross agency and international organization core competencies in developing new technology concepts to a proof-of-concept maturity level?
- important considerations regarding IP, moving material, data and products across nations

Additionally, based on the project presentations, participants will be updated on next steps for continued project collaboration, funding, and CANEUS support as well as estimated decision milestones post-workshop.

How do the activities on day 3 relate to the overall workshop objectives?

We now understand what solutions may be desired by end-users/customers (Day 1) and the maturity of currently developing technologies (Day 2). Therefore the “gap” between what customers/end-user want and the ability of current technologies to address these needs can be identified. Teams on day three therefore work towards developing project frameworks that demonstrate the ability to bridge this gap by leveraging the involvement of consortium members including technology providers, end-users, customers, integrators, and other value chain members.

Program

EXECUTIVE SUMMARY

The goal of the 2nd CANEUS Fly-by-Wireless Workshop is: (a) to refine the focus projects and pertinent details, identify specific development needs, outline teaming and funding schemes, plan project oversight and execution, and establish milestones from which to gauge success of the projects, and (b) stimulate formation of project teams comprised of technology providers and application/end users and project proposals from each team that have significant mutual benefit and high potential of funding from internal or external organizations. In order to accomplish these ambitious goals, the workshop program has been structured in four parts:

1. Raison d'être for CANEUS Fly-by-Wireless Sector Consortia
2. Sessions Covering End-User Needs and Technology Providers Gap
3. Poster Sessions
4. FBW Consortia Project Development, Implementation, and Success Criteria

Workshop participants will be provided with three documents:

A. Handbook for Project Development

The CANEUS FBW Consortia handbook will help participants guide through the various stages of the project preparations. Furthermore, throughout the three days of workshop activities, participants will be given extra documents and notes to add to the Handbook manual in order to provide with the tools needed to participate in

all the planning processes. Please make a special effort to keep your Handbook up-to-date by adding documents and presentation notes. This will enable you to maximize the benefits from this workshop. By the last workshop session, this document is expected to be complete and an accessible, take-home guide for the entire workshop.

B. CANEUS Handbook on ITAR and International Collaborations

With the assistance from Squires, Sanders and Dempsey Law Firm in Washington, DC, CANEUIS will offer an Handbook in order for both non-US and US based organizations, both small and large, to comply with export control regulations for international collaborations.

C. IP Framework and Teaming Agreements

Participants will be provided with a template on project teaming agreement and CANEUS IP framework for successful collaborations.

WORKSHOP SESSIONS

The 2nd CANEUS Fly-by-Wireless Workshop program is structured to help launch well-defined and funded projects using international collaboration that brings the best solutions to the boardroom. These collaborations will allow for well-informed decisions on new program starts, whether it is research, test and evaluation, or introduction of new products to the end user to be made quickly and confidently.

The 2nd CANEUS Fly-by-Wireless Workshop addresses three broad themes --

1. Aerospace Needs and Lessons Learned.
2. IVHM / Wireless Technology state-of-the-art and technology assessments and Roadmaps to help advance known technologies and to identify new areas for research and development.
3. Project Development using Best of Breed technologies needed to reduce risk and cost for the End User by way of International Collaboration.

These themes will provide the foundation for the 15 intense workshop sessions covering keynote sessions, CEO/CTO panel, a technology showcase of targeted exhibits, and much more.

With weakening economic trends, new world leadership, the time is perfect for initiating aerospace international collaborations, by bringing together complementary core competencies from across organizations from many countries, in developing new technology concepts to a proof-of-principle level of maturity.

These Panel Sessions will review the needs of the aerospace industry in manned space, unmanned space, aeronautics, defense, and reliability, as well as the lessons learned in space, aeronautics, and defense. Projects identified in Sector Consortia Development will incorporate the needs and the lessons learned from these sectors.

SESSION 1

“Plenary” Welcome, Introduction And Workshop Overview

8:30am - 9:30am

Chairs:

Jules O’Shea, Professor, École Polytechnique de Montreal

Roy Vestrum, Flight Research Laboratory, Institute of Aerospace Research, National Research Council Canada

Speakers:

Christophe Guy, Director, École Polytechnique de Montreal

Welcome on behalf of the Workshop Hosts

Milind Pimprikar, Founder & Chairman, CANEUS International

CANEUS Innovation Model, vision, mission, and goals

Workshop Objectives; Overview of Day 1 to 3

KEYNOTE ADDRESS

Plenary

9:30am - 10:00am

Mairead Lavery, Vice-President, Strategy and Business Development, Bombardier Aerospace

SESSION 2

Raison d’être of FBW Consortia & Projects

10:30am - 11:30am

The speakers will provide participants with the raison d’être of FBW consortia and the CANEUS approach to implementing its goals.

Chair:

Andre Bazergui, P-DG/CEO, CRIAQ, Consortium for Research and Innovation in Aerospace in Quebec

Speakers:

Rick Earles, Executive Director, CANEUS USA Inc.

Raison d’être of FBW consortia and Projects: The process for launching Sector Consortia and projects within the CANEUS innovation framework. The approach for FBW Consortia to implement its roadmaps, covering end-user needs, technology assessment, and success metrics; IP & Funding Mechanism

Todd Farrar, Business Acceleration Manager, Dawnbreaker, Inc., NY

The Workshop Facilitation Process: Expected Outcomes from Day 1, 2 and 3: How do the activities on day 3 relate to the overall workshop objectives- Well defined and funded projects?

David Russel, IAR-NRC

CANEUS FBW Consortium: Mission, Vision & Goals; Accomplishments from the CANEUS 2009 Workshop at NASA’s Ames Research Center in March 2009; Overview of Five Areas: Sensor DAQ Micro-Miniaturization, Passive Wireless Sensor Tag, Less-Wire Architectures, Structural Health Monitoring, Wireless systems immunity in Electromagnetic Environment (HIRF, Lightning etc)

SESSION 3

IP, Funding, NDA and Export Control

11:30am - 12:00pm

Chair:

Jim Castellano, Sector Development Officer,
Aerospace, Defence and Marine Branch, Industry
Canada

Speakers:

Raj Shea, NASA Ames

*Technical Information Exchange Procedures for
CANEUS Consortia Collaborative Projects*

George N. Grammas, Partner, Squire, Sanders &
Dempsey L.L.P. Washington, DC

*ITAR Requirements and filing, Security Review for
US and Non-US Organizations, and Project Charter
Agreement*

Lynne C. Sabatino, Senior Export Controls
Officer, Export Controls Division, Foreign Affairs
and International Trade Canada

*Canadian export controls requirements and
process*

A. IP and Collaborative Projects Charter Agreement Implementation

This session will provide an overview of the issues associated with intellectual property, enabling participants of the CANEUS FBW09 Workshop to understand the interrelationship of business creation, technology creation and intellectual property. In addition to this, the panel will discuss how this foundation interrelates with the CANEUS IP model for CANEUS Collaborative Project Implementation

Objectives:

1. Provide a review of the essential elements of the CANEUS intellectual property framework using specific collaboration example.
2. Discuss this IP model as compared to those from other Consortia models such as CRIAQ, ATP, EU, in terms of their applicability to the needs of the CANEUS FBW09 program and agree on an IP model for CANEUS Collaborative Projects Implementation
3. Discuss intellectual property issues, which will affect the implementation of the CANEUS Consortia Projects.

B. Project Charter Agreement and International Export Control / ITAR Regulations Panel

The “Project Charter Agreement and Export Control Policy Panel” is to debate and determine the pros and cons of issues related to the emerging technology opportunities and obstacles for taking potential concepts to product / system level so that Canada, U.S., Europe and other foreign policy-makers may make well-informed judgments concerning the formation and implementation of pertinent policy decisions in these fields.

Objectives:

1. Provide the CANEUS ITAR framework for the infusion of emerging technology-based systems into Aerospace applications.
2. Discuss the draft “Project Charter Agreement”.
3. Discuss how the current agreements can be amended in order for new partners to join the consortium and to implement these collaborative projects.

LUNCH KEYNOTE

End-User Perspective and Spectrum Consortia Status since 1st CANEUS/ NASA FBW Workshop

12:00pm - 1:30pm

Chair:

Claude Perron, IAR's Aerospace Manufacturing Technology Centre, (AMTC), NRCC

Keynote Speaker:

Radoslaw R. Zakrzewski, Sensors and Integrated Systems, Goodrich Corporation, USA

"Protected spectrum for wireless avionics systems"

KEYNOTE ADDRESS

Structural Health Monitoring - SHM Needs

1:30pm - 2:00pm

Chair:

Wanping Zheng, Manager, Space Structures, Space Technologies, Canadian Space Agency

Keynote Speaker:

Victor Giurgiutiu, Structural Mechanics program manager, Air Force Office of Scientific Research (AFOSR)

Structural Health Monitoring and NDE -- an Air Force Office of Scientific Research Structural Mechanics Perspective
Research Structural Mechanics Perspective

SESSION 4

End-Users Needs Assessment-Passive Wireless Sensor Tag and Sensor DAQ Micro-Miniaturization

2:00pm - 3:00pm

Chairs:

Yvon Savaria, Chairman, Electrical Engineering, École Polytechnique de Montreal

Patrice Masson, Professor, University of Sherbrooke

Speakers:

William "Cy" Wilson, NASA Langley Research Centre, Virginia

NASA Opportunities for Passive Wireless SAW Sensors

Hugh HT Liu, Institute for Aerospace Studies University of Toronto

Autonomous multi-UAV Cooperative Flight and Applications

Round-table Workshop Participants:

ULA- United Launch Alliance

Securaplane

Jet Propulsion Laboratory-JPL, NASA

Pratt & Whitney

KEYNOTE ADDRESS

End-User Needs-Future Outlook

3:30pm - 4:00pm

Chair:

Peter Jarvis, Chief Engineer, CAE Electronics (TBC)

Keynote Speaker:

John McGraw, Deputy Director for Flight Standards Policy, FAA

FAA Flight Technologies and Procedures on the emerging wireless technologies

SESSION 5

End User Needs Assessments- Structural Health Monitoring

4:00pm - 5:00pm

Aerospace vehicle programs have always relied on the cables and connectors to provide power, grounding, data and time synchronization throughout a vehicle's life-cycle. Even with numerous improvements, wiring and connector problems and sensors continue to be key failure points, causing many hours of troubleshooting and replacement. Costly flight delays have been precipitated by the need to troubleshoot cables/connections and add or repair a sensor. Even with the weight penalties, wiring continues to be too expensive to remove once it is installed. Miles of test instrumentation and low flight sensor wires still plague the Aerospace industry. New technology options for data connectivity, processing and micro/nano manufacturing are making it possible to retrofit existing vehicles like the Space Shuttle. New vehicles can now develop architectures that provide for and take advantage of alternate connectivity to wires.

This session motivates the aerospace industry and technology providers to establish: A new emphasis for system engineering approaches to reduce cables and connectors, Provisions for modularity and accessibility in the vehicle architecture, and A set of technologies that support alternatives to wired connectivity

Chair:

Claude Lavoie, Bombardier Aerospace

Speakers:

Keith Meredith, Aeroinsight (TBC)

DPHM Canada Roadmap

Nezih Mrad, Defence Scientist, Defence R&D Canada (DRDC), Department of National Defence (DND)

Wireless Technology for Military Platforms Health Monitoring

Round-table Workshop Participants:

Boeing

LMCO

Embrear

Pratt & Whitney

SESSION 6

End-User End-Users Needs Assessment- HIRF, Lightning etc

5:00pm - 5:30pm

Aircraft are more and more relying on systems to perform functions which are necessary for the continued safe flight and landing. Moreover the electronic components of those systems become smaller and smaller and consume less and less energy, which makes them very sensitive to electromagnetic hazards: Lightning, HIRF, ESD, LIRF...

Aircraft systems are interconnected by cables that in addition of being vehicle for signal propagation, they also favour the propagation of unwanted energy that may lead to electromagnetic interferences (EMI) for electronic and electrical equipment

Chair:

Claude J.P. Lavoie, Principal Engineering Specialist, Advanced Product Development,
Bombardier Aerospace

Speaker:

Fidele Moupfouma, Chief Aircraft Electromagnetic Hazards Protection Engineer, Bombardier
Aerospace Montreal

Wireless Systems immunity in aircraft Electromagnetic Environment (HIRF, Lightning, ESD)

Round-table Workshop Participants:

Boeing

Pratt & Whitney

NASA-JPL

Embrear

These Sessions will review the state-of-the-art and technology breakthroughs being made worldwide that can reduce aerospace cabling. For example, Surface Acoustic Wave (SAW) sensors are making their commercial debut in temperature and pressure applications. Low power, adaptive, and robust radio technologies and systems are being used for important wireless applications in several Space Agency programs. Some aircraft now have FAA-approved wireless devices, e.g. a breakthrough has produced a no-power sensor-tag system that can collect data from a variety of common sensors and switches at distances useable for aerospace vehicle applications.

Speakers will discuss exciting developments from their own organizations to meet the challenging requirements of next generation aircraft and spacecraft applications. Each speaker will present recent advances in his/her organization within the context of potential collaborative projects, to a proof-of-principle level of maturity, and speculate on the path and timeframe for future system-level development.

DAILY OVERVIEW AND KEYNOTE

8:30am – 9:00am

Facilitator:

Todd Farrar, Business Acceleration Manager,
Dawnbreaker Inc.

Chair:

David Russel, Flight Research Laboratory, Institute of Aerospace Research, National Research Council Canada

Keynote Speaker:

Fu-Ko Chang, Professor and Director, Structures and Composites Laboratory, Stanford University
Aircraft IVHM: Challenges and Opportunities

SESSION 7

“Tech-Provider I” Sensor DAQ Micro-Minimization, Passive Wireless Sensor Tag and Less–Wire Architectures

9:00am - 10 :00am

These Sessions will review the state-of-the-art and technology breakthroughs being made worldwide that can reduce aerospace cabling. For example, Surface Acoustic Wave (SAW) sensors are making their commercial debut in temperature and pressure applications. Low power, adaptive, and robust radio technologies and systems are being used for important wireless applications in several Space Agency programs. Some aircraft now have FAA-approved wireless devices, e.g. a breakthrough has produced a no-power sensor-tag system that can collect data from a variety of common sensors and switches at distances useable for aerospace vehicle applications.

Chairs:

Richard Hurteau, Professor, Electrical Engineering , École Polytechnique de Montréal

Sonia Blanco, Researcher MOMS, INO, (National Optic Institute)

Speakers:

Jacqueline Hines, CEO, Applied Sensor Research & Development Corporation

Recent developments in SAW wireless sensor-tag technology

Donald C. Malocha, Professor, School of Electrical Engineering, University of Central Florida

Surface Acoustic Wave Passive Wireless Multi-Sensor System

SESSION 8

“Tech-Provider II” Sensor DAQ Micro-Miniaturization, Passive Wireless Sensor Tag and Less-Wire Architectures

10:30am – 12 :00nn

Chairs:

Steve Totolo, Instrumentation Specialist, IAR-NRC (Institute of Aerospace Research, National Research Council Canada)

Lorenzo Maradola, L3-Comm

Speakers:

Eamonn Fearon, Centre Manager, Lairdside Laser Engineering Centre, University of Liverpool
Laser Assisted Direct Write: A Method Of RFID Modification And In Situ Sensor And Antenna Generation

Ahmadreza Tabeshh, and **Luc G. Frechette**, University of Sherbrooke
Power for Wireless Sensor Networks

Francis Picard, INO (National Optic Institute)
Microfabrication capabilities and optical microsensor activities at INO

LUNCH KEYNOTE

12:00nn - 1:30pm

Chairs:

Laurent Lamarre, Researcher, IREQ (Hydro-Quebec), Chair IEEE

Keynote Speaker:

Radislav A. Potyrailo, Principal Scientist , GE Global Research Center, NY
Ubiquitous Passive 13.56-MHz RFID Tags as Highly Selective Chemical And Biological Sensors

KEYNOTE ADDRESS

Structural Health Monitoring – Technology and Challenges

1:30pm - 2:00pm

Chair:

Pascal Hubert, McGill University

Keynote Speaker:

Tribikram Kundu, Chairman, SPIE SHM Conferences, University of Arizona
Guided Waves for Structural Health Monitoring – Challenges and Opportunities

SESSION 9

Tech-Provider II” Structural Health Monitoring Instrumentation, and Wireless systems immunity in Electromagnetic Environment

2:00pm - 3:00pm

Chair:

Nezih Mrad, DRDC-DND (Defense Research and Development Canada- Dept. of National Defense)

Speakers:

Cheng-Kuei Jen, IMI (Industrial Materials Institute)
Integrated and Flexible Ultrasonic Transducers for Health Monitoring of Aeronautic Structures

Carles Ferrer, CNEM (National Center of Microelectronics) Spain
Smart sensors integration with a hardware platform for Aeronautic Structural Health Monitoring

Anader Benyamin-Seeyar, IEEE Montreal
Wireless Sensor and Actuation Networking for Fly-by-Wireless - Avionic Control Application

KEYNOTE ADDRESS

3:30pm - 4:00pm

Minoru Taya, University of Washington
Structural Health Monitoring Systems for composite structures in future airplanes

SESSION 10

SHM- Instrumentation and Systems

4:00pm - 5:30pm

Chairs:

Jureck Sasiadek, Carleton University
Frederic Pichette, CAE Electronics

Speakers:

Douglas Goodman, CEO Ridgetop Group Inc.
Advanced Sensory Prognostics and Management Systems

Karim Allidina and **Mourad N. El-Gamal**,
McGill University
Miniature Ultra Wideband Modulation Systems for Low Interference Wireless Communications in Aerospace Applications

Yvon Savaria, **Guchuan Zhu**, **Mohamad Sawan**,
Normand Bélanger, École Polytechnique de Montréal
Design and characterization of an AFDX to CAN-aerospace Bridge soft IP core

Maurizio Dacunha, University of Maine

BANQUET KEYNOTE

5:30pm - 7:00pm

Chair:

Pierre Labrèche, CMC (TBC)

Speaker:

Francois Caza, Vice President and Chief Engineer,
Bombardier Aerospace

Wednesday *June 10th, 2009*

These sessions are the heart of this workshop and will address project development, funding mechanism, implementation, and international collaboration issues. The solutions offered in these sessions will guide participants in the implementation process of their projects.

We have endeavoured to create a program that optimizes the use of participant time to produce measurable deliverables to advance the goals and activities of each of the existing well-defined projects as well identify new projects with strong business case.

Topics covered in the sessions from the second part of the workshop will feed into this third part of the workshops: participants will apply the knowledge acquired during the previous sessions towards formulating and implementing existing as well new projects. Finally, as a measure of the workshop success, each project team will present the findings and outcome to gauge project completion and milestone achievements, and the avenues to be pursued to overcome challenges such as intellectual property, funding, and government regulations (such as ITAR).

DAILY OVERVIEW AND KEYNOTE

8:30am - 9:00am

Facilitator:

Todd Farrar, Business Acceleration Manager,
Dawnbreaker Inc.

Chair:

Carlos Trindade, CRIAQ (Consortium for Research and Innovation in aerospace in Quebec)

Keynote Speaker:

Bob Walker, Assistant Deputy Minister and CEO,
DRDC-DND (Defense Research and Development
Canada- Dept. of National Defense)

Military Needs and DRDC-RND partnerships

SESSION 11

Overview of Projects

9:00am - 10:00am

These sessions aim to refine the well-defined projects, both existing reviewed as well as new proposed: participants will outline teaming and funding schemes, plan project oversight and execution, and establish milestones from which to gauge success of the project. It is our hope that we will be able to include the participation of those who are interested in more than one area, and include the participation of a wide range of expertise.

Chair:

Rick Earles, CANEUS USA

Speakers:

Robab Safa-Baksh, Boeing, Lead- SHM (Structural Health Monitoring)

David Russel, Flight Research Laboratory, Institute of Aerospace Research, National Research Council Canada

Maurizio Dacunha, University of Maine

Brian McCabe, Sikorsky Aircraft

Fidele Moupfouma, Bombardier Aerospace Core Engineering, Montreal

Wireless Systems immunity in aircraft Electro-magnetic Environment (HIRF, Lightning, ESD)

SESSION 12

Funding Opportunities

10:30am - 12:00nn

Funding provides the life-blood for initiating, maturing and implementing new systems. This session will address the priorities of government programs in developing and funding such programs, as well as potential projects, leading to procurement actions.

Chairs:

Peter Eggleton, Telligence Group

Jim Castellano, Sector Development Officer, Aerospace, Defence and Marine Branch, Industry Canada

Speakers:

Gabriella Graff-Innes, CCC (Canadian Commercial Corporation)

Denis Godin, NSERC (Natural Sciences and Engineering Research Council), Canada

Carlos Trindade, CRIAQ (Consortium for Research and Innovation in aerospace in Quebec)

Yves Plourde, IRAP(Industrial Research Assistance Program), Canada

LUNCH KEYNOTE

12:00nn - 1:30pm

Chair:

Anader Benyamin-Seeyar, IEEE Montreal

Speaker:

Sherry Noble, SVP Business Solutions and Technology, Export Development Corporation
Innovative financing, insurance and risk management solutions

KEYNOTE ADDRESS

1:30pm - 2:00pm

Speaker:

Duane Cuttrell, F-35 Joint Strike Fighter, LMCO-Skunk Works
Challenges to Technology Development and Transition - From Idea to Implementation; Lockheed Martin Perspective

SESSION 13

Project Success Criteria

1:30pm - 3:00pm

This session will address the selection criteria, metrics used for assessing progress, program duration, and strategies for infusing these technologies into aerospace applications. In this session, participants delve further into focused activities to include tasks, responsibilities, timelines, teaming, budget, and success evaluation metrics.

Chair:

Jim Castellano, Sector Development Officer,
Aerospace, Defence and Marine Branch,
Industry Canada

Speakers:

Linda Beth Schilling, NIST (National Institute of Standards and Technology) - Technology Innovation Program

Advanced Technology Program – a Public/Private Partnership – What It Was and How Did It Work

Frank Barros, NIST (National Institute of Standards and Technology)- Small Business Innovation Research

Garry Jahns, NASA- Small Business Innovation Research

Adarsh Deepak, CEO Science and Technology Corporation

SESSION 14

Project Summary

3:00pm - 4:00pm

This sessions aim to summarize the output of each of the project teams. In this session, workshop participants have the opportunity to learn about the activities and implementation plan of all proposed project teams.

Chair:

Milind Pimprikar, Founder & Chairman,
CANEUS International

Speakers:

Roy Vestrum, Flight Research Laboratory, Institute of Aerospace Research, National Research Council Canada

Todd Farrar, Business Acceleration Manager,
Dawnbreaker Inc.

SESSION 15

CEO-CTO Panel

4:00pm - 5:00pm

To demonstrate the deliverables of these Workshops, we have included a CEO/CTO/Expert panel session representing key experts to comment on the various projects as well as offer their vision for each areas. The CEO/CTO Panel members will share their vision for addressing the high-risk, high-cost project initiatives for the infusion of novel emerging technologies in aerospace systems.

Chairs:

Suzanna Benoit, CEO-AERO Montreal (Invited)

John Legatt, CTO- CFN Consultants (Ottawa) (Invited)

Panellists:

Kesh Narayanan, Director, Division of Industrial Innovation and Partnerships (IIP), Directorate for Engineering, National Science Foundation
NSF SBIR program related to Nanotechnology, Advanced Materials and Manufacturing

Jacques Daoust, CEO, Investissement Québec

Phil Dion, CTO, CaseBank Technologies (TBC)

Henry Rothschild, CEO-Precarn

CEO/CTO Panel on International Collaborative Projects infusing Emerging Technologies for the Needs of the Aerospace Industry

Objective: The goal of this dialogue is to match mature laboratory proven concepts to commercial and government needs, so that investment policies will focus on the purpose, launch, and life-cycle support of new technology products.

The CEO/CTO Panel, a highlight of the CANEUS 2009 FBW Workshop, will discuss how to stimulate economic growth with the proposed collaborative projects through government and commercial investment. At the CEO/CTO Panel on International Collaborations, the CEOs and CTOs of major aerospace and defense manufacturers, funding agencies and Stake-holders will debate and discuss the potential infusion of the emerging technologies into the next generation of their aircraft, spacecraft, and defense applications, driven by the needs of end-users.

1. The high-profile government and industry players will discuss commercial and government aerospace needs at an international level. Discussions will focus around the benefits of fostering collaborations between international technology developers, aerospace industries and organizations to facilitate the transitioning of mature concepts to system-level implementation. Particularly, which are the areas of the end-user and technology developer's perspectives that will benefit most from international collaboration?
2. How do you prioritize activities to execute a project, and allocate the funds necessary for each of these activities? How do you define the funds necessary to execute a project?

3. The Panel will offer ideas on how aerospace companies can influence future investment by government agencies and private capital so that international collaborations are possible.
 4. This session will further help increase understanding of partnership opportunities between government and private sectors, and determine how these partnerships can drive a smooth transition of emerging technology concepts to systems.
 5. The policy-makers will debate and discuss the issues relating to the implementation of these international collaborations between the three regions. They will address the issues that govern international trade and technology transfer as well as challenges with the multilateral regulations and policies in the global marketplace to achieve new frontiers in aerospace technology, commerce, and exploration. They may also comment on how current national and international policy agreements can be formulated to achieve this vision.
- The CEO's will comment on how they will implement it.
 - The CTO's will layout the vision of the roadmap

PROJECTS AND REPORTS

These sessions aim to summarize the output of each of the existing and proposed Consortia projects. In these sessions, workshop participants will also have the opportunity to learn about the implementation plan and nominate new leaders for the working groups.

WORKSHOPS CONCLUSION

This session will summarize the output of the Workshop.

Thursday and Friday *June 11th and 12th, 2009*

Technical tours to local end-user and technology provider facilities will showcase a cross-section of practical solutions relevant to the problems being addressed in the CANEUS FBW09 Workshops.

- **CANADIAN SPACE AGENCY** (Thursday AM)
- **BOMBARDIER AIRCRAFT MANUFACTURER** (Thursday PM)
- **CAE ELECTRONICS SIMULATOR** (Friday AM)

Visit to CAE's engineering and production facilities. The Montréal facility is CAE's world headquarters and also the main plant for design and manufacturing of full flight simulators.

Description of visit

Following a short corporate presentation on CAE in our auditorium, you will be invited to tour the engineering offices and labs where CAE designs and integrates the avionics systems for high-fidelity simulators. You will tour the main manufacturing facilities where we produced over 50 flight simulators in 2008. You will also have an opportunity to come aboard our first B787 flight simulator as the test pilot teams validate the simulator prior to customer delivery later this summer. The tour will be hosted by several of CAE's avionics experts, and will be available to answer questions on the latest advances in avionics simulation.

Corporate overview

CAE is a world leader in providing simulation and modelling technologies and integrated training solutions for the civil aviation industry and defence forces around the globe. With annual revenues exceeding C\$1.4 billion, CAE employs approximately 7,000 people at more than 75 sites and training locations in 20 countries. We have the largest installed base of civil and military full-flight simulators and training devices. Through our global network of 27 civil aviation and military training centres, we train more than 75,000 crewmembers yearly. We also offer modelling and simulation software to various market segments and, through CAE's professional services division, we assist customers with a wide range of simulation-based needs. www.cae.com

- **AIR CANADA** (Friday PM)

Supporting Activities

POSTER PRESENTATIONS

- Exciting early research results in Wireless Instrumentation & Design, Wireless Architectures & Networks, and Passive Wireless Sensor-Tags
- SHM system development including testing results.
- Perspectives of end-users from aerospace and defense sectors, including “lessons learned” from the implementation of wireless systems in aerospace applications.
- Funding perspectives, both private and government, of early, mid-maturity and late-stage (system-level) investment into technology development.
- Examples of international, cross-border collaborations leading to joint development at various maturity levels ranging from the concept to system stage.

Poster papers will be on display Monday through Wednesday in the poster room. Authors will be available to discuss their papers during the designated poster session times.

Some examples of the titles to be presented are:

- **Vibration-Based Energy Harvesting For Wireless Sensor Networks**
Nezih Mrad, Ph.D.
- **Electrical Characterization Of Composites For Aircraft Fuselage**
William Tse

- **Detection of Hidden Corrosion by Pulsed Eddy Current Using Time Frequency Analysis**
Seid Mohammad Saleh Hosseini
- **Development of Intelligent Health Monitoring System for Rotating Machinery and Structural Components**
Ali Mahvash and Abdelhak Oulmane

EXHIBITS

International technology providers, end-users, and business development organizations specializing in areas closely related to the projects of the SHM will showcase their latest developments for aerospace systems at the CANEUS FBW09 exhibits. These will be held concurrently with the Workshops, and are formatted to support the activities of workshop participants.

There are limited exhibit spaces that would allow large and small industries and universities / research laboratories to showcase their capabilities: both hardware and other demos. These displays will also contribute towards the projects presented during the workshop sessions. To encourage maximum participation, the Planning Committee has allocated maximum 5 exhibit spaces for each project.

HANDBOOK FOR PROJECT DEVELOPMENT, BACKGROUND PAPERS AND FACILITATORS

The project development handbook will help participants guide through the various stages of the project preparations. There are many additional background papers that are being commissioned to help provide participants with the various topics of the interest.

Furthermore, throughout the week's activities, you will be given extra documents and notes to add to the Handbook manual in order to supply you with the tools needed to participate in all the planning processes. Please make a special effort to keep your Handbook up-to-date by adding documents and presentation notes. Doing so will enable you to maximize the benefits from this workshop. By the last workshop session, this document is expected to be complete and an accessible, take-home guide for the entire workshop.

STUDENT PAPERS AND AWARD

Papers are also solicited in any of the areas from graduate and undergraduate students. Students must indicate their status and affiliation. A panel will review submissions and select a winner in advance of the Workshop. The most innovative paper will be awarded a prize of \$1,000 and two prizes of \$500 each that will take the concept to products/systems level. The winner will be announced during the Tuesday evening dinner at the Workshop.

Session Chair Guidelines

BEFORE THE SESSION

Please review the presentations of your session with your co-chair, and make any comments as to length or content. Each session has three speakers. Each presentation is to be 20 minutes long, with a 5 minute period at the end of the session for the Question and Answer period (Q&A), for a total timeframe of 75 minutes. Please decide on an order for speakers to present, and notify the speakers, Technical Co-Chairs Jim Castellano (Jim.Castellano@ic.gc.ca) and Jules O'Shea (jules.oshea@polymtl.ca) as well at CANEUS HQ to Milind Pimprikar (Milind.pimprikar@caneus.org),

Ensure that the speakers have taken the appropriate steps to set-up their presentations beforehand. If they have not, please advise them to do so and notify a workshop associate so as to ensure a speedy set-up. Please inform a workshop associate of any problems with the operation of AV equipment and/or room lights.

Please meet speakers 15 minutes before the session outside the assigned room. They will be asked to meet with you there at that time, and will give you introductory details about themselves. Double check the running order for speakers and advise speakers of the strict time limit on presentations.

DURING THE SESSION

1. Please ensure the Session begins at the scheduled time.
2. To open the session, announce the Session title, the number of presentations to be made, the timing for

the presentations and Q&A, plus a short personal overview of both co-chairs.

3. Next, announce the title of the first paper and the short personal details of the speaker
4. Again, each session will have three speakers and each presentation is restricted to 20 minutes maximum, to be followed by a 5-minute Q&A period.
5. Keeping track of the time, please alert speakers when they have 5 minutes left in their presentations. Be polite but firm when alerting speakers of the end of their presentation time.
6. After each presentation is over, please move to the next presentation by announcing the title of the presentation and the short personal details of the speaker.
7. After all the presentations are over, the Session chairs can facilitate the Q&A period by being the first to pose a question. If there is already a line at the audience microphone, the Session Co-chairs will prompt the audience member to ask their question.
8. All audience members asking questions should identify themselves by Name and Organization.
9. Keep track of the question period time (15 minutes) and announce when there is only enough time for one more question. Debate sparked over a difficult or controversial question can be capped by suggesting that a resolution can be pursued after the session.
10. If presentations run short and audience members have no questions, the Session chairs may opt to host a general discussion for the remainder of the session.

11. Please close the session by thanking the speakers and delegates.
12. And lastly, please make special announcements if asked by Workshop organizers. Please note that if a session runs over the allotted time, into a break, the next session will start at the scheduled time, and the break will be cut short.

AFTER THE SESSION

As Session Chair, we also ask that you to keep record of important points from the presentations, including the Q&A period, which would then be useful for the reports scheduled for the last day of the Workshops. These points will be summarized to propose and formulate the potential strategies.

The summary you will prepare will also be published in the final proceeding book, prior to each chapter.

THANK YOU

Dear FBW09 Workshop Organizing Committee Members:

Our sincere thanks to you for volunteering your valuable time to serve on this important mission. Due to your dedication and hard work, we have succeeded in achieving our ambitious goal of creating an international network devoted to identifying promising concepts that have been proven in the laboratory, and subsequently transitioning them for application into aerospace systems.

As a result of your efforts, we have put together a series of workshops that have proved unparalleled in terms of the focus of topics presented by world-class speakers. For this significant achievement, you should all be very proud. We are honoured to have had the opportunity to work side-by-side with you in coordinating this trendsetting event that will continue to shape and influence our community in this critically important area.

Thank you once again for your vital contributions, and we look forward to working with you in the future.

Best regards,

Milind Pimprikar
Chairman, FBW09
Chair, CANEUS International

ACKNOWLEDGEMENTS

Ultimately, CANEUS measures its success as an international organization by the number of MNT concepts that it has successfully “shepherded” to system-level products for aerospace applications.

The CANEUS Fly-by-Wireless 2009 Workshop is the product of intense collaboration by committed individuals at various levels of preparation.

From the day we initiated this activity until its implementation today, this workshop would not have been possible without the creativity, hard work, un-selfish dedication and numerous sacrifices of one individual: **Mr. Allan Reyes** and his family. There are simply no words to express our gratitude and appreciation for all of his contributions to the workshop and to the CANEUS Organization as a whole.

It is unfortunate that Allan could not join us at the workshop due to some unfortunate bureaucratic difficulties. Although Allan is unable to attend the workshop in person, he receives our sincerest thanks for all he has done throughout this process. On behalf of the Organizing Committee and the CANEUS International Organization, Allan and his family will be in our heart and his presence will be felt at every moment of this historic undertaking!

The workshop Handbook is the core of the workshop planning and implementation process. The Handbook formulation, constant attention on details, communication and guidance through every stage of preparation, up to assisting with authoring and formatting the Handbook document, has enabled the success of the workshop. CANEUS extends special appreciation to **Mr. Marion “Rick” Earles**, Executive Director of CANEUS USA Inc. for his invaluable contributions throughout the preparation process. The hard work and sacrifices of Rick and his family in Cleveland, Ohio has helped to make the CANEUS vision a reality.

CANEUS thanks the École Polytechnique de Montréal for hosting this event. **Prof. Jules O’Shea** and his team have been involved in ensuring the success of this entire event by overseeing everything from broad issues to minor details. We are deeply grateful for their leadership and guidance over the past year.

We are fortunate to have received support for the workshop from several exceptional organizations in Canada. CANEUS would like to thank the Institute of Aerospace Research of the National Research Council Canada (**IAR-NRC**) for their generous support for printing all workshop materials; and the Aerospace, Defence and Marine Branch of **Industry Canada** (Mr. Jim Castellano) for their kind financial support to help facilitate the workshop through the **Dawnbreaker** Group.

We are very pleased to welcome and support this partnership with Dawnbreaker for CANEUS FBW09 workshop, particularly the support of Mr. Todd Farrar, Business Acceleration Manager at Dawnbreaker, Inc.

The CANEUS Fly-by-Wireless 2009 Workshop is an end-user driven forum capable of providing highly refined technology guidance in the form of well defined projects. As such, the financial contribution of the End-user Companies: **Bombardier Aerospace** and **Pratt & Whitney Canada** has been essential in subsidizing the workshop activities and also guiding the approach of the workshop.

CANEUS would like to extend a special thanks to **Dr. Wanping Zheng** of the Canadian Space Agency for his phenomenal support over the past couple of years. CANEUS thanks his efforts to coordinate the technical tours.

CANEUS extends special appreciation to **IEEE Montreal Section** Chair Dr. Laurent Lamarre and Vice Chairman **Dr. Fidele Moupfouma** for their unwavering and energetic support to promote the workshop to IEEE members as well providing financial assistance to the workshop. Dr. Fidele Moupfouma's exceptional commitment and efforts in developing the Wireless systems immunity in Electromagnetic Environment (HIRF, Lightning etc) initiative have truly made our collective vision to launch several collaborative projects, a reality.

At the forefront of coordination and communication with Workshop speakers and expert panellists are the Workshop Organizing Committee Members. These dedicated individuals have worked tirelessly to ensure that the multi-faceted workshop sessions come off smoothly. CANEUS thanks Workshop Chair **Roy Vestrum**, Technical Chairs: **Jim Castellano**, **David Russel**, **Wanping Zheng** and **Nezih Mrad** for their technical roles in bringing the workshop to fruition.

The FBW09 workshop is also building on the partnership with the other well established Consortium: CRIAQ - Consortium for Research and Innovation in Aerospace in Quebec. CANEUS thanks the support of CRIAQ CEO **Dr. André Bazergui** and their Project Director Mr. Carlos Trindade to advance these efforts.

CANEUS thanks Mr. Eric Légua, Mme. Line Parisien, Mme. Nathalie Lévesque and Mme. Chantal Cantin for their intense efforts to coordinate various workshop logistical activities. Their team at École Polytechnique de Montréal worked patiently and diligently to facilitate all critical logistical issues of registration, catering, exhibits, audio-visual, signage, security, public-relations, amongst others. Finally, my personal appreciation to Ms. Isabel Valenta, who has been assisting me as my right hand and will be overseeing the workshop coordination.

2ND CANEUS FLY-BY-WIRELESS WORKSHOP PLANNING COMMITTEE

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